H04N

PICTORIAL COMMUNICATION, e.g. TELEVISION (measuring, testing G01; systems for autographic writing, e.g. writing telegraphy, which involve following an outline G08 [N: G08C 21/00]; information storage based on relative movement between record carrier and transducer G11B; coding, decoding or code conversion, in general H03M; broadcast distribution or the recording of use made thereof H04H))

Definition statement

This subclass/group covers:

- transmission of pictures or their transient or permanent reproduction either locally or remotely, by methods involving both the following steps:
- step (a): the scanning of a picture, i.e. resolving the whole picture-containing area into individual picture-elements and the derivation of picture-representative electric signals related thereto, simultaneously or in sequence;
- step (b): the reproduction of the whole picture-containing area by the reproduction of individual picture-elements into which the picture is resolved by means of picture-representative electric signals derived therefrom, simultaneously or in sequence;
- (in group H04N 1/00) systems for the transmission or the reproduction of arbitrarily composed pictures or patterns in which the local light variations composing a picture are not subject to variation with time, e.g. documents (both written and printed), maps, charts, photographs (other than cinematograph films);
- circuits specially designed for dealing with pictorial communication signals, e.g. television signals, as distinct from merely signals of a particular frequency range.

References relevant to classification in this group

This subclass/group does not cover:

circuits or other parts of systems which form the subject of other subclasses	H03C, H03F, H03J, H04B, H04H
systems in which legible alphanumeric or like character forms are analysed according to step (a) of Note (1) to derive an electric signal from which the character is recognised by comparison with stored information	G06K

systems for the direct photographic copying of an original picture in which an electric signal representative of the picture is derived according to the said step (a) and employed to modify the operation of the system, e.g. to control exposure,	G03
systems for the reproduction according to step (b) of Note (1) of pictures comprising alphanumeric or like character forms but involving the production of the EQUIVALENT of a signal which would be derived according to the above-mentioned step (a), e.g. by cams, punched card or tape, coded control signal, or other means	G01D, G06T, H04L
systems for the reproduction according to the above-mentioned step (b) of pictures comprising alphanumeric or like character forms and involving the generation according to the above-mentioned step (a) of picture-representative electric signals from a pre-arranged assembly of such characters, or records thereof, forming an integral part of the systems	B41B, G06K
printing, duplication or marking processes, or materials therefor	B41C, B41J, B41M, G03C, G03F, G03G

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

television systems	asystems for the transmission and reproduction of arbitrarily composed pictures in which the local light variations composing a picture MAY change with time, e.g. natural "live" scenes, recordings of such scenes such as cinematograph films

H04N 1/00

Scanning, transmission or reproduction of documents or the like, e.g. facsimile transmission; Details thereof [N: (recording arrangements for measuring instruments G01D; sensing record carriers G06K 7/00; character or pattern recognition G06K 9/00; mosaïc printer telegraph systems H04L 21/00)]

Definition statement

This subclass/group covers:

- transmission of time-invariant pictures, e.g. documents (both written and printed), maps, charts, photographs (other than cinematograph films), or their transient or permanent storage or reproduction either locally or remotely by methods involving both scanning and reproduction;
- systems involving the generation, transmission, storage or reproduction of time-invariant pictures; image manipulation for such reproduction on particular output devices;
- devices applied to the transmission, storage or reproduction of time-invariant pictures, e.g. facsimile apparatus, digital copiers, (digital) scanners, multifunctional peripheral devices;
- circuits specially designed for dealing with pictorial communication signals, e.g. facsimile signals or colour image signals, as distinct from merely signals of a particular frequency range;
- storage or transmission aspects of still video cameras.

Relationship between large subject matter areas

- H04N 1/00 is an application place for a large number of IT technologies, which are covered per se by the corresponding functional places
- Image servers, hosts and clients use internally specific computing techniques. Corresponding techniques used in general computing are found in G06F or G06Q. This concerns data storage, software architectures, error detection or correction in general computing, monitoring, image retrieval, browsing, Internet browsing, computer security, billing or advertising
- Image servers, hosts and clients use specific telecommunication techniques for the image transmission process. Corresponding techniques used in generic telecommunication networks are found in subclasses H04B, H04H, H04L, H04M, H04W. This concerns monitoring or testing of transmitters/receivers, broadcast or multicast, maintenance, administration, testing, data processing in data switching networks, home networks, real-time data network services, data network security, applications for data network, wireless networks per se
- Image scanners use specific scanning techniques. Corresponding techniques are found in G02B. This concerns optical scanning systems
- Image reproducers use specific reproduction techniques. Corresponding techniques are found in B41J, G03G, G06K. This concerns printing, electrography, producing a permanent visual presentation of output data
- General image processing techniques are found in G06T

References relevant to classification in this group

This subclass/group does not cover:

Printing mechanisms	B41J
Electrography; Magnetography	G03G
Image retrieval; Retrieval from Internet	G06F 17/30
Computer security	G06F 21/00
Storage management	**G06F3/06M**
Digital output to print unit	G06F 3/12
Producing a permanent visual presentation of output data; object-oriented print data processing in printers	G06K 15/00
Sensing record carriers	G06K 7/00
Character or pattern recognition	G06K 9/00
Payment schemes, Commerce	G06Q 20/00, G06Q 30/00
Image data processing in general	G06T
Monitoring or testing of transmitters/receivers	H04B 17/00
Broadcast communication	H04H
Maintenance or administration in data switching networks	H04L 12/24
Data processing in data switching networks	H04L 12/56
Message switching systems	H04L 12/58
Real-time data network services	H04L 29/06176
Data network security	H04L 29/06551
Applications for data network services	H04L 29/08081
Public key encryption	H04L 9/30
Scanning details of electrically scanned solid-state devices	H04N 3/14
Capture aspects of still video cameras	H04N 5/225
Wireless networks	H04W

Informative references

Attention is drawn to the following places, which may be of interest for search:

Supporting or handling copy material in printers	B41J 11/00 B41J 13/00 B41J 15/00

Handling thin or filamentary material	B65H
Colorimetry	G01J
Handling of copy material in photocopiers	**G03G15/00G**
Constructional details of equipement or arrangements specially adapted for portable computer application	G06F 1/1626
Power management in computer systems	G06F 1/3203
Adressing or allocating within memory systems or architectures	G06F 12/00
Input and output arrangements for computers	G06F 3/00
Interaction techniques for graphical user interfaces	G06F 3/048
Digital output to printers	G06F 3/12
Producing a permanent visual presentation of output data	G06K 15/00
Sensing record carriers	G06K 7/00
Character or pattern recognition	G06K 9/00
Methods or arrangements for acquiring or recognising human faces, facial parts, facial sketches, facial expressions	G06K 9/00221
Methods or arrangements for recognising human body or animal bodies or body parts	G06K 9/00362
Methods or arrangements for recognising scenes	G06K 9/00624
General-purpose image data processing	G06T 1/00
Image watermarking	G06T 1/0021
Editing figures and text; Combining figures or text	G06T 11/60
Geometric image transformation in the plane of the image	G06T 3/00
Image enhancement or restoration	G06T 5/00
Image analysis	G06T 7/00
Image coding	G06T 9/00
Access-control involving the use of a pass	G07C 9/00007
Access-control by means of a password	G07C 9/00142

Coding, decoding or code conversion, for error detection or error correction	H03M 13/00
Secret communication; Jamming of communication	H04K 1/00 H04K 3/00
Arrangements for detecting or preventing errors in the information received	H04L 1/00
Charging arrangements in data networks	H04L 12/14
Arrangements for secret or secure communication; Encryption	H04L 9/00
Simultaneous speech and telegraphic or other data transmission over the same conductors	H04M 11/06
Telephonic metering arrangements	H04M 15/00
Scanning of motion picture films	H04N 3/36
Television signal recording	H04N 5/76
Circuits for processing colour television signals	H04N 9/64
Connection management in wireless communications networks	H04W 76/00

Special rules of classification within this group

In this main group Indexing Codes are used:

The numbering of the codes is based on the numbering of the subgroups;

- codes, e.g. **T04N201/04D7M**, which have a numbering the first part of which corresponds to a subgroup which is at the tip end of a subgroup branch, e.g. H04N 1/0402, are used to classify detailed information and may be applied to that subgroup, e.g. **T04N201/04D7M** may be used in combination with H04N 1/0402;
- codes, e.g. H04N 2201/0402, which have a numbering the first part of which corresponds to a subgroup which is at the head or node end of a subgroup branch, e.g. H04N 1/04, are used to classify orthogonal information and may be applied to any subgroups in the corresponding subgroup branch, e.g. H04N 2201/0434 may be used in combination with H04N 1/0402 and/or H04N 1/1013.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Additional information	any information other than the still picture itself, but nevertheless associated with the still picture
Documents or the like	documents (both written and printed), maps, charts, photographs (other than cinematograph films)
Main-scan	the first completed scan
Mode	way or manner of operating
Scanning	the displacement of active reading or reproducing elements relative to the original or reproducing medium, or vice versa
Still picture apparatus	any apparatus generating, storing, transmitting or reproducing non-transient images
Single-mode communication	a communication in which the mode is not changed

Synonyms and Keywords

In patent documents the following abbreviations are often used:

IP	Internet Protocol
OS	Operating System
PC	Personal Computer
GPS	Global Positioning System
MFP	Multifunctional peripheral
MFD	Multifunctional device
RFID	Radio-frequency identification

In patent documents the following words or expressions are used as synonyms:

- Complex device and Multifunctional peripheral
- Complex machine and Multifunctional peripheral
- Hybrid device and Multifunctional peripheral
- Hybrid machine and Multifunctional peripheral
- Digital camera and Still video camera
- Metadata and Additional information
- Fast scan and Main scan
- Slow scan, Subscan and Sub scan

H04N 1/00002

[N: Diagnosis, testing or measuring; Detecting, analysing or monitoring not otherwise provided for (error detection, error correction or monitoring in digital computers or digital computer components G06F 11/00)]

References relevant to classification in this group

This subclass/group does not cover:

Determining the necessity for preventing unauthorised reproduction	H04N 1/0084
Detecting scanning velocity or position	H04N 1/047
Fault detection in circuits or arrangements for control supervision between transmitter and receiver or between image input and image output device	H04N 1/32609
Discrimination between the two tones in the picture signal of a two-tone original	H04N 1/403
Control or modification of tonal gradation or extreme levels, e.g. dependent on the contents of the original or references outside the picture,	H04N 1/407
Discrimination between different image types	H04N 1/40062

H04N 1/00095

[N: Systems or arrangements for the transmission of the picture signal]

References relevant to classification in this group

This subclass/group does not cover:

Transmitting or receiving computer data via an image communication device	H04N 1/00206
Transmitting or receiving image data via a computer or computer network	H04N 1/00209
Circuits or arrangements for control or supervision between transmitter and receiver	H04N 1/32

H04N 1/00132

[N: in a digital photofinishing system, i.e. a system where digital photographic images undergo typical photofinishing processing, e.g. printing ordering]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Data processing systems for commerce	G06Q 30/00

H04N 1/00209

[N: Transmitting or receiving image data, e.g. facsimile data, via a computer, e.g. using e-mail, a computer network, the internet, I-fax]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Message switching systems, e.g. e-mail systems	H04L 12/58

H04N 1/00236

[N: using an image reading or reproducing device, e.g. a facsimile reader or printer, as a local input to or local output from a computer (image input to or image output from a computer via a network H04N 1/00209)]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Portable computers comprising integrated printing or scanning devices	**G06F1/16P2P**

H04N 1/00249

[N: with a photographic apparatus, e.g. a photographic printer or a projector (photographic apparatus per se G03B, G03D)]

References relevant to classification in this group

This subclass/group does not cover:

Photographic apparatus per se	G03B, G03D

Special rules of classification within this group

Typically with apparatus of the kind classified in G03B, G03D or G03G.

H04N 1/00254

[N: with an electrophotographic copying machine, i.e. a photocopier]

Special rules of classification within this group

Typically with apparatus of the kind classified in G03G.

H04N 1/00278

[N: with a printing apparatus, e.g. a laser beam printer]

Special rules of classification within this group

Typically with apparatus of the kind classified in B41J or G06K 15/00.

H04N 1/00281

[N: with a telecommunication apparatus, e.g. a telex machine, a selective call terminal (details of transmission H04N 1/00095; establishing a communication with one of a facsimile machine or another apparatus sharing a single line H04N 1/32704; interfacing cordless telephone terminals with an accessory to increase the functionality of user interface H04M 1/72527)]

Special rules of classification within this group

Typically with apparatus of the kind classified in other H04 subclasses or other H04N main groups.

H04N 1/00283

[N: with a television apparatus]

Special rules of classification within this group

Typically with apparatus of the kind classified in other H04N main groups.

H04N 1/00286

[N: with studio circuitry, devices or equipment, e.g. television cameras (television studio circuitry, devices or equipment per se H04N 5/222)]

References relevant to classification in this group

This subclass/group does not cover:

Television studio circuitry, devices or equipment per se	H04N 5/222

Special rules of classification within this group

Typically with apparatus of the kind classified in H04N 5/222 and subgroups.

H04N 1/00291

[N: with receiver circuitry (television receiver circuitry per se H04N 5/44)]

References relevant to classification in this group

This subclass/group does not cover:

Television receiver circuitry per se	H04N 5/44

Special rules of classification within this group

Typically with apparatus of the kind classified in H04N 5/44 and subgroups.

H04N 1/00326

[N: with a data reading, recognizing or recording apparatus, e.g. with a bar-code apparatus (arrangements for the associated working of recording or reproducing apparatus with related apparatus G11B 31/00)]

Special rules of classification within this group

Typically with apparatus of the kind classified in G06K or G11B.

H04N 1/00567

[N: Handling of original or reproduction media, e.g. cutting, separating, stacking]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Handling thin or filamentary material	B65H
Supporting or handling copy material in printers	B41J 11/00, B41J 13/00, B41J 15/00
Handling of copy material in photocopiers	**G03G15/00G**

H04N 1/00838

[N: Preventing unauthorised reproduction]

References relevant to classification in this group

This subclass/group does not cover:

Marking an unauthorised reproduction with identification	H04N 1/32101
Restricting access	H04N 1/4406

Informative references

Attention is drawn to the following places, which may be of interest for search:

Preventing copies being made in photocopiers	G03G 21/04

H04N 1/024

Details of scanning heads; [N: Means for illuminating the original (circuit details thereof H04N 1/40)]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Details of scanning arrangements	H04N 1/04

H04N 1/028

for picture information pick-up

Informative references

Attention is drawn to the following places, which may be of interest for search:

Television cameras	H04N 5/225

H04N 1/0281

[N: with means for collecting light from a line or an area of the original and for guiding it to only one or a relatively low number of picture element detectors (light-guides per se G02B 6/00)]

Definition statement

This subclass/group covers:

No longer used for classification

References relevant to classification in this group

This subclass/group does not cover:

Light-guides per se	G02B 6/00

H04N 1/029

Heads optically focused on only one picture element at a time [N: (H04N 1/0281 takes precedence)]

Definition statement

This subclass/group covers:

No longer used for classification

References relevant to classification in this group

This subclass/group does not cover:

Means for collecting light from a line or an area of the original and for guiding it to only one or a relatively low number of picture element detectors	H04N 1/0281

H04N 1/032

for picture information reproduction

Definition statement

This subclass/group covers:

No longer used for classification.

This subject matter is now classified in B41J or G06K 15/00.

H04N 1/04

Scanning arrangements, [N: i.e. arrangements for the displacement of active reading or reproducing elements relative to the original or reproducing medium, or vice versa] (H04N 1/387 takes precedence; [N: scanning by varying the direction of light in general G02B 26/10])

References relevant to classification in this group

This subclass/group does not cover:

Composing, repositioning or otherwise modifying originals	H04N 1/387

Informative references

Attention is drawn to the following places, which may be of interest for search:

Optical scanning systems	G02B 26/10
Projection optics in photocopiers	G03G 15/0409
Character printers involving the fast moving of a light beam in two directions	G06K 15/1228
Details of scanning heads	H04N 1/024

Special rules of classification within this subgroup

Where possible both the main and sub scanning arrangements should be classified, using a class for the invention and an Indexing Code for subsidiary information. Manual scanning and scanning using two-dimensional arrays are exceptions to this rule.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Main scan direction	The direction of the first completed scan line

H04N 1/047

Detection, control or error compensation of scanning velocity or position ([N: H04N 1/0402 and] H04N 1/17 take precedence)

References relevant to classification in this group

This subclass/group does not cover:

Scanning different formats; Scanning with different densities of dots per unit length, e.g. different numbers of dots per inch (dpi); Conversion of scanning standards	H04N 1/0402
The scanning speed being dependent on content of picture	H04N 1/17

Informative references

Attention is drawn to the following places, which may be of interest for search:

Detection, control or error compensation of scanning velocity or opposition in photographic character printers involving the fast moving of an optical beam in the main scan direction	G06K 15/1219

Special rules of classification within this group

Where possible, when classifying in this subgroup, details of the main and subscan should also be classified using other subgroups of H04N 1/04.

H04N 1/0473

[N: in subscanning direction, e.g. picture start or line-to-line synchronisation]

Special rules of classification within this group

Where possible, when classifying in this subgroup, details of the main scan should also be classified using other subgroups of H04N 1/04.

H04N 1/053

in main scanning direction, e.g. synchronisation of line start or picture elements in a line

Special rules of classification within this group

Where possible, when classifying in this subgroup, details of the subscan should also be classified using other subgroups of H04N 1/04.

H04N 1/1004

[N: using two-dimensional electrical scanning, e.g. cathode-ray tubes (using two-dimensional arrays H04N 1/195)]

Definition statement

This subclass/group covers:

No longer used for classification

H04N 1/113

using oscillating or rotating mirrors

References relevant to classification in this group

This subclass/group does not cover:

Optical details of the scanning system	G02B 26/10

Informative references

Attention is drawn to the following places, which may be of interest for search:

Character printers involving the fast moving of a light beam in two directions	G06K 15/1228

H04N 1/1135

[N: for the main-scan only]

References relevant to classification in this group

This subclass/group does not cover:

Optical details of the scanning system	G02B 26/10, G02B 26/12

Informative references

Attention is drawn to the following places, which may be of interest for search:

Optical printers using dot sequential main scanning by means of a light deflector	B41J 2/471
Character printers involving the fast moving of an optical beam in the main scan direction	G06K 15/1204

H04N 1/12

using the sheet-feed movement [N: or the medium-advance or the drum-rotation movement] as the slow scanning component, [N: e.g. arrangements for the main-scanning] ([N: sheet-feed movement by translatory movement of a flat picture-bearing surface H04N 1/1008; main-scanning using oscillating or rotating mirrors H04N 1/113;] using multi-element arrays H04N 1/19)

Informative references

Attention is drawn to the following places, which may be of interest for search:

Character printers involving the fast moving of an optical beam in the main scan direction	G06K 15/1204

H04N 1/1205

[N: using a device, e.g. an optical fibre bundle, converting rectilinear scanning into circular line scanning or vice versa]

Definition statement

This subclass/group covers:

No longer used for classification

H04N 1/14

using a rotating endless belt carrying the scanning heads [N: or at least a part of the main scanning components]

Definition statement

This subclass/group covers:

No longer used for classification

H04N 1/16

using a rotating helical element

Definition statement

This subclass/group covers:

No longer used for classification

H04N 1/19

using multi-element arrays

Informative references

Attention is drawn to the following places, which may be of interest for search:

Optical printers using arrays of radiation sources	B41J 2/447
Photographic character printers simultaneously exposing more than one point	G06K 15/1238

H04N 1/1911

[N: Simultaneously or substantially simultaneously scanning picture elements on more than one main scanning line, e.g. scanning in swaths]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Photographic character printers simultaneously exposing more than one point on more than one main scanning line	G06K 15/1257

H04N 1/192

Simultaneously [N: or substantially simultaneously] scanning picture elements on one main scanning line [N: (details of the sub-scanning H04N 1/10, H04N 1/12)]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Photographic character printers simultaneously exposing more than one point on one main scanning line	G06K 15/1242

H04N 1/21

Intermediate information storage (H04N 1/387, H04N 1/41 take precedence; [N: for control between transmitter and receiver or between image input and image output device H04N 1/32358]; information storage in general G11; [N: indexing, editing G11B 27/00])

Definition statement

This subclass/group covers:

Where the storage results in a record that is not merely transient.

References relevant to classification in this group

This subclass/group does not cover:

Storage resulting in a transient record, for control or supervision between image input and image output device	H04N 1/32358
Composing, repositioning or otherwise modifying originals	H04N 1/387
Bandwidth or redundancy reduction	H04N 1/41

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Intermediate	having no limiting meaning

H04N 1/2112

[N: using still video cameras]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Image capture in digital cameras	H04N 5/225
Still video cameras	**H04N101/00**

H04N 1/27

involving production of a magnetic intermediate picture

Informative references

Attention is drawn to the following places, which may be of interest for search:

Magnetography	G03G 19/00

H04N 1/29

involving production of an electrostatic intermediate picture

Informative references

Attention is drawn to the following places, which may be of interest for search:

Electrography	G03G

H04N 1/31

Mechanical arrangements for picture transmission, e.g. adaptation of clutches, gearing, gear transmissions [N: contains no documents]

Special rules of classification within this group

The subject matter concerned is classified in H04N 1/00567 or H04N 1/04.

H04N 1/32

Circuits or arrangements for control or supervision between

transmitter and receiver [N: or between image input and image output device (H04N 1/38, H04N 1/387 take precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Circuits or arrangements for blanking or otherwise eliminating unwanted parts of pictures	H04N 1/38
Composing, repositioning or otherwise modifying originals	H04N 1/387

Informative references

Attention is drawn to the following places, which may be of interest for search:

Communication control for transmission of digital information in general	H04L 29/02
Digital output from electrical digital data processing unit to print unit	G06F 3/12

H04N 1/32005

[N: Automation of particular receiver jobs, e.g. rejecting unwanted calls (requesting a communication from a transmitter H04N1/327E; with picture signal storage for forwarding messages H04N 1/32358)]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Automatic arrangements for answering calls in telephonic equipment	H04M 1/64

H04N 1/32037

[N: Automation of particular transmitter jobs, e.g. multi-address calling, auto-dialing]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Telephonic equipment for signalling identity of wanted subscriber	H04M 1/26

H04N 1/32101

[N: Display, printing, storage or transmission of additional information, e.g. ID code, date and time or title]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Television bitstream transport arrangements involving transporting of additional information	**H04N7/24T4**
Television systems for the transmission of television signals using pulse code modulation, using bandwidth reduction involving the insertion of extra data	H04N 7/26372
Broadcast communication systems specially adapted for using meta-information	H04H 60/73

Synonyms and Keywords

In patent documents the word "metadata" is often used as a synonym for "additional information".

H04N 1/32144

[N: embedded in the image data, i.e. enclosed or integrated in the image, e.g. watermark, super-imposed logo or stamp]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Image watermarking	G06T 1/0021
Audio watermarking	**G10L19/00W**

H04N 1/32154

[N: Transform domain methods (H04N 1/32309 takes precedence]

References relevant to classification in this group

This subclass/group does not cover:

In colour image data	H04N 1/32309

Informative references

Attention is drawn to the following places, which may be of interest for search:

Transmission of digital television signals using bandwidth reduction and involving the insertion of extra data	H04N 7/26372

H04N 1/32358

[N: using picture signal storage, e.g. at transmitter (H04N 1/17 takes precedence)]

Definition statement

This subclass/group covers:

Storage results in a transient record, e.g. buffering

References relevant to classification in this group

This subclass/group does not cover:

Scanning speed being dependent on content of picture	H04N 1/17
Storage resulting in a record which is other than merely transient	H04N 1/21

H04N 1/324

[N: intermediate the transmitter and receiver terminals, e.g. at an exchange]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Stored and forward switching systems in transmission of digital information	H04L 12/54

H04N 1/32614

[N: related to a single-mode communication, e.g. at the transmitter or at the receiver]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Coding, decoding or code conversion, for error detection or error correction	H03M 13/00
Arrangements for detecting or preventing errors in received digital information	H04L 1/00

H04N 1/32704

[N: Establishing a communication with one of a facsimile and another telecommunication apparatus sharing a single line]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Simultaneous speech and other data transmission over the same conductors in telephonic communication systems	H04M 11/06

H04N 1/333

Mode signalling or mode changing; Handshaking therefor

Informative references

Attention is drawn to the following places, which may be of interest for search:

Negotiation of communication capabilities for communication control in transmission of digital information	H04L 29/06537

H04N 1/3333

[N: during transmission, input or output of the picture signal; within a single document or page]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Systems modifying digital information transmission characteristics according to link quality	H04L 1/0001

H04N 1/36

for synchronising or phasing transmitter and receiver

Definition statement

This subclass/group covers:

Obsolete subject matter, analog facsimile communication.

H04N 1/38

Circuits or arrangements for blanking or otherwise eliminating unwanted parts of pictures (H04N 1/387 takes precedence)

Definition statement

This subclass/group covers:

Removing parts of the image e.g. smudges, extracting part of an image, screen out unwanted image regions, removing finger shadow, removing perforated holes when copying a perforated paper.

References relevant to classification in this group

This subclass/group does not cover:

Composing, repositioning or otherwise modifying originals	H04N 1/387

Special rules of classification within this group

Drop out for parts of the image while changing color is in H04N 1/62, form drop out data in H04N 1/4177.

H04N 1/387

Composing, repositioning or otherwise [N: geometrically] modifying originals (photoelectronic composing of characters B41B 19/00; [N: image data processing or generation, in

general G06T])

Definition statement

This subclass/group covers:

Composing e.g. combining 2 images. Reading of books and correction for geometric distortions due to curved (book page) original. Geometric modifications caused through warping of image.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Editing, producing a composite image by copying with focus on copy machine	G03G 15/36
Text processing	G06F 17/20
Pagination/imposition	G06F 17/217
Geometric modification and warping in general	G06T 3/00
Teaching/communicating with deaf, blind, mute people	G09B 21/00

H04N 1/3871

[N: the composed originals being of different kinds, e.g. low- and high-resolution originals]

Definition statement

This subclass/group covers:

Eg. combining chart, text, logo (low resolution/bit depth) and photo (high resolution/bit depth) or foreground and background, with focus on image processing. Also high dynamic range (HDR) imagery when combined with H04N 1/407.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Combining objects while rendering PDL	G06T 11/60
Inserting foreground into background with focus on camera	H04N 5/272

H04N 1/3872

[N: Repositioning or masking]

Definition statement

This subclass/group covers:

Image cropping, cutting out, masking with arbitrary shape.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Selection / ordering of images (from movies)	G11B 27/034

H04N 1/3873

[N: defined only by a limited number of coordinate points or parameters, e.g. corners, centre; for trimming]

Definition statement

This subclass/group covers:

User defines the corner coordinates to extract image for repositioning. Cutting out, cropping, number of points is important. Low resolution pre-scan and high-resolution main scan of part of platen.

H04N 1/3875

[N: combined with enlarging or reducing (enlarging or reducing per se H04N 1/393)]

Definition statement

This subclass/group covers:

Part of the image is enlarged/reduced to fit new position. Reducing for medium, zoom, belief map.

References relevant to classification in this group

This subclass/group does not cover:

Corrections or small zoom factors	H04N 1/3873
Enlarging or reducing	H04N 1/393

H04N 1/3876

[N: Recombination of partial images to recreate the original image]

Definition statement

This subclass/group covers:

Combining two images which have been scanned by a scanner which does not cover the entire image. Panoramic image creation, combination, stitching. Process is done digitally and not mechanically.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Mosaic images or mosaicing.	G06T
Aligning images	G06T 7/0024
Mechanical corrections	**H04N1/04B**

H04N 1/3877

[N: Image rotation]

Definition statement

This subclass/group covers:

Rotating the image by any amount, e.g. 90degree. Also when printing double sided or 4 images on 1 page.

Informative references

Attention is drawn to the following places, which may be of interest for search:

When focus is on image processing.	G06T 3/60

H04N 1/3878

[N: Skew detection or correction]

Definition statement

This subclass/group covers:

Limited to detecting and correcting skew, i.e. errors during scanning: normally less than 45degree.

Relationship between large subject matter areas

See also in G06K 9/3275.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Mechanical skew detection	H04N 1/00681

H04N 1/393

Enlarging or reducing

Definition statement

This subclass/group covers:

Mainly the mechanical enlargement process, whole image, DIN A4 to DIN A3 (larger than DIN A4).

Special rules of classification within this group

This subgroup takes precedence over H04N 1/04.

H04N 1/3935

[N: with modification of image resolution, i.e. determining the values of picture elements at new relative positions]

Definition statement

This subclass/group covers:

Digitally enlarging or reducing images with a change of resolution including e.g. interpolation (digital).

Relationship between large subject matter areas

Beware of H04N 1/40068 which has resolution conversion where physical size is irrelevant.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Interpolation in general	G06T 3/40

H04N 1/40

Picture signal circuits (H04N 1/387 takes precedence)

Definition statement

This subclass/group covers:

General documents regarding quality aspects, quantization (errors), scanning either B/W or color, video printer, frame grabber, memory arrangement or management, smear reduction for CCD.

References relevant to classification in this group

This subclass/group does not cover:

Composing, repositioning or otherwise modifying originals	H04N 1/387

Informative references

Attention is drawn to the following places, which may be of interest for search:

Moving images, e.g. television	H04N 5/14

H04N 1/40012

[N: Conversion of colour to monochrome]

Definition statement

This subclass/group covers:

Converting coloured documents into B&W so they can be printed on monotone printers, e.g. changing green into stripes, red into dots... . Converting from RGB via thresholding to grayscale.

H04N 1/40025

[N: Circuits exciting or modulating particular heads for reproducing continuous tone value scales (H04N 1/401, H04N 1/407 take precedence)]

Definition statement

This subclass/group covers:

Writing: control of print heads, stilus heads, electrostatic heads. Continuous driving signals.

Relationship between large subject matter areas

Overlap with G06K 15/12.

References relevant to classification in this group

This subclass/group does not cover:

Compensating positionally unequal response of the pick-up or reproducing head	H04N 1/401
Control or modification of tonal gradation or of extreme levels	H04N 1/407

Informative references

Attention is drawn to the following places, which may be of interest for search:

Multipass inkjet	G06K 15/102

H04N 1/40031

[N: for a plurality of reproducing elements simultaneously]

Definition statement

This subclass/group covers:

Writing: multiple print elements, essentially LED or thermal printheads, but also using several lasers in parallel.

H04N 1/40037

[N: the reproducing element being a laser]

Definition statement

This subclass/group covers:

Mainly continuous tone laser printers.

H04N 1/40056

[N: Circuits for driving or energising particular reading heads or original illumination means (H04N 1/401, H04N 1/407 take precedence)]

Definition statement

This subclass/group covers:

Control of light during reading of a document; circuits for driving diodes, analogue switches for light control. Also exposure time of sensor etc.

References relevant to classification in this group

This subclass/group does not cover:

Compensating positionally unequal response of the pick-up or reproducing head	H04N 1/401
Control or modification of tonal gradation or of extreme levels	H04N 1/407

Informative references

Attention is drawn to the following places, which may be of interest for search:

Mechanical details	H04N 1/028
Lamps per se	H05B 39/041, H05B 41/38

H04N 1/40062

[N: Discrimination between different image types, e.g. two-tone, continuous tone]

Definition statement

This subclass/group covers:

Image segmentation, finds regions in bitmap image e.g. text, table, photo, line image; also "mixed raster content" or "MRC".

Informative references

Attention is drawn to the following places, which may be of interest for search:

For image processing per se	**G06T5/00F**
Character recognition, OCR	**G06K9/20L**

H04N 1/40068

[N: Modification of image resolution, i.e. determining the

values of picture elements at new relative positions (H04N 1/3935 takes precedence)]

Definition statement

This subclass/group covers:

Change resolution while physical size is irrelevant, e.g. original image is 600dpi and printer is only capable of printing 300dpi, so conversion is necessary.

References relevant to classification in this group

This subclass/group does not cover:

With modification of image resolution, i.e. determining the values of picture elements at new relative positions	H04N 1/3935

Informative references

Attention is drawn to the following places, which may be of interest for search:

Increasing or decreasing spatial resolution	**G06K15/02B10F2**, **G06K15/02B10F4**

H04N 1/40075

[N: Descreening, i.e. converting a halftone signal into a corresponding continuous-tone signal; Rescreening, i.e. combined descreening and halftoning]

Definition statement

This subclass/group covers:

Descreening and/or rescreening, self-explanatory.

H04N 1/40081

[N: Soft dot halftoning, i.e. producing halftone dots with gradual edges]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Resolution enhancement by intelligently pacing sub-pixels when focus is on write head control.	H04N 1/40025
General edge enhancement	H04N 1/409

H04N 1/40087

[N: Multi-toning, i.e. converting a continuous-tone signal for reproduction with more than two discrete brightnesses or optical densities, e.g. dots of grey and black inks on white paper]

Definition statement

This subclass/group covers:

Provides more than just level 0 and level 255 for image, e.g. has levels 0, 127 and 255, i.e. multi-level halftoning. Typical documents: EP817464 (Seiko) shows two types of ink C1 and C2 (color multi-toning in H04N 1/52), EP889639 (Xerox) shows levels of white, light gray, dark gray and black.

Informative references

Attention is drawn to the following places, which may be of interest for search:

General bit depth reduction	H04N 7/26968
Variation of dot size	H04N 1/4057

H04N 1/40093

[N: Modification of content of picture, e.g. retouching (geometric modifications H04N 1/387)]

Definition statement

This subclass/group covers:

Very few applications. Local modifications, e.g. making lighter and posterization of natural images.

H04N 1/401

Compensating positionally unequal response of the pick-up or reproducing head (H04N 1/403 takes precedence)

Definition statement

This subclass/group covers:

Limited to image readers, mostly line sensors. Shading correction, illumination profile, head calibration, positionally varying noise etc. Also defects in the image sensors. Compensation of ambient illumination.

References relevant to classification in this group

This subclass/group does not cover:

Discrimination between the two tones in the picture signal of a two-tone original	H04N 1/403

Informative references

Attention is drawn to the following places, which may be of interest for search:

Correction of isolated defects in image	H04N 1/409
Control of light source	H04N 1/40056
Defect maps for area sensors	H04N 5/2176
Ambient illumination also in	**T04N201/00N**

H04N 1/4015

[N: of the reproducing head]

Definition statement

This subclass/group covers:

Printers, corrects misaligned or defective heads; head calibration.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Malfunctioning inkjet nozzles	**B41J2/165D1**

H04N 1/405

Halftoning, i.e. converting the picture signal of a continuous-tone original into a corresponding signal showing only two levels

Definition statement

This subclass/group covers:

Halftoning in general, either B&W only or each color layer separately. Examples are EP126782, EP673150.

H04N 1/4051

[N: producing a dispersed dots halftone pattern, the dots having substantially the same size (different sizes H04N 1/4057)]

Definition statement

This subclass/group covers:

Dispersed dots, i.e. dots that are not concentrated in clusters which spread out from a central point. Examples are US5317418 - e.g. Gaussian filter, blue noise; US5426122 - FM rasters.

H04N 1/4052

[N: by error diffusion, i.e. transferring the binarising error to neighbouring dot decisions]

Definition statement

This subclass/group covers:

Error diffusion for halftoning, note that error diffusion is also used for other purposes in other parts of H04N 1/00. Examples are EP507354, EP808055.

H04N 1/4053

[N: with threshold modulated relative to input image data or vice-versa]

Definition statement

This subclass/group covers:

Illustrative examples of subject matter classified in this group are WO8906080, EP715451.

H04N 1/4055

[N: producing a clustered dots or a size modulated halftone pattern]

Definition statement

This subclass/group covers:

Halftone dots grow from a central point and spread in all directions. Also dispersed clusters. Illustrative examples are US3688033, EP651560.

H04N 1/4056

[N: the pattern varying in one dimension only, e.g. dash length, pulse width modulation (PWM)]

Definition statement

This subclass/group covers:

Growth of halftone dot in one direction only, includes Pulse Width Modulation. Illustrative examples are EP212990, US4951152.

H04N 1/4057

[N: the pattern being a mixture of differently sized sub-patterns, e.g. spots having only a few different diameters (multi-toning H04N 1/40087)]

Definition statement

This subclass/group covers:

Different dot sizes, each dot has the same density. Illustrative examples are EP647059 (fig.5), US4680645 (fig.1).

Special rules of classification within this subgroup

For dots of different densities (inks) classify in H04N 1/40087.

H04N 1/4058

[N: with details for producing a halftone screen at an oblique angle (H04N 1/4056 takes precedence)]

Definition statement

This subclass/group covers:

Illustrative examples are GB2026283, WO9307709.

References relevant to classification in this group

This subclass/group does not cover:

Pattern varying in one dimension only	H04N 1/4056

H04N 1/407

Control or modification of tonal gradation or of extreme levels, e.g. background level

Definition statement

This subclass/group covers:

Selection of particular gamma correction table, correction depending on media scanned or printed on, film type correction, correction of tone scale for dot gain.

Relationship between large subject matter areas

Similar to H04N 1/6027 for colour.

H04N 1/4072

[N: dependent on the contents of the original]

Definition statement

This subclass/group covers:

Analysis of image content to determine final correction to be applied, e.g. automatic background deletion.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Conversion to binary	H04N 1/403

H04N 1/4074

[N: using histograms]

Definition statement

This subclass/group covers:

Histogram analysis to determine tone correction parameters.

Informative references

Attention is drawn to the following places, which may be of interest for search:

In context of pure image processing	G06T 5/40

H04N 1/4076

[N: dependent on references outside the picture]

Definition statement

This subclass/group covers:

Pre-scanning to read reference strips (B&W), which is used to set max and min levels. Very limited test patterns containing only black (offset correction) and white (gain correction), e.g. printed next to an image or as separate image. Standard pattern on monitor (no light for black reference and light on for white reference).

Informative references

Attention is drawn to the following places, which may be of interest for search:

Monitor calibration per se	H04N 5/202, H04N 9/69

H04N 1/4078

[N: using gradational references, e.g. grey-scale test pattern analysis]

Definition statement

This subclass/group covers:

Test pattern analysis for gray scale corrections.

Informative references

Attention is drawn to the following places, which may be of interest for search:

For colour	H04N 1/6033, H04N 1/6055

H04N 1/409

Edge or detail enhancement; Noise or error suppression

Definition statement

This subclass/group covers:

Noise or error correction. Elimination of "streaky effects".

Informative references

Attention is drawn to the following places, which may be of interest for search:

Image processing per se	G06T 5/001, G06K 9/40
Scanning correction due to reader error	H04N 1/401

H04N 1/4092

[N: Edge or detail enhancement]

Definition statement

This subclass/group covers:

Fairly self-explanatory. Has also first edge detection and then correction. Edge emphasis, sharpness correction, unsharp masking, smoothing.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Image processing per se	**G06T5/00E**
For color	H04N 1/58
For cameras	H04N 5/208

H04N 1/4095

[N: Correction of errors due to scanning a two-sided document, i.e. show-through correction]

Synonyms and Keywords

In patent documents the following expressions "show-through" and "see-through" are often used as synonyms.

H04N 1/4097

[N: Removing errors due external factors, e.g. dust, scratches]

Definition statement

This subclass/group covers:

Removal of streaks, dust, blemishes, tears, scratches, hairs. Removing scratches from photographs using infrared image.

H04N 1/41

Bandwidth or redundancy reduction (by scanning H04N 1/17; [N: H04N 7/26 takes precedence; for data acquisition G06F 17/40; coding for image data processing in general G06T 9/00; data compression in general H03M 7/30])

Definition statement

This subclass/group covers:

General coding groups for still images, B&W, gray scale or each color component separately. This head group has using different coding techniques wihtin the same document, combination of different techniques, or choosing from different available coding mehtods (e.g.. characters with technique 1, pictures with technique 2).

References relevant to classification in this group

This subclass/group does not cover:

Television systems for the transmission of television signals using bandwidth reduction	H04N 7/26

Informative references

Attention is drawn to the following places, which may be of interest for search:

Coding of color images	H04N 1/64
For mixed image compression	H04N 7/26069

H04N 1/4105

[N: for halftone screened pictures]

Definition statement

This subclass/group covers:

Image to be coded must be halftoned image only.

H04N 1/411

for the transmission [N: or storage] or reproduction of

two-tone pictures, e.g. black and white pictures

Definition statement

This subclass/group covers:

B&W images, i.e. binary coding.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Continuous tone compression	H04N 7/26

H04N 1/4115

[N: involving the recognition of specific patterns, e.g. by symbol matching]

Definition statement

This subclass/group covers:

Eg. huffman coding.

H04N 1/413

Systems or arrangements allowing the picture to be reproduced without loss or modification of picture-information

Definition statement

This subclass/group covers:

Lossless coding, has a variety of coding methods, e.g. comparing different codings of a line and choosing shortest code; universal coding.

H04N 1/415

in which the picture-elements are subdivided or grouped into fixed one-dimensional or two-dimensional blocks

Definition statement

This subclass/group covers:

Block coding, also mix of Huffman and run-length coding.

H04N 1/417

using predictive or differential encoding

Definition statement

This subclass/group covers:

Predictive coding, arithmetic coding.

H04N 1/4172

[N: Progressive encoding, i.e. by decomposition into high and low resolution components]

Definition statement

This subclass/group covers:

Different resolutions of the image, wavelet coding for binary images.

H04N 1/4175

[N: involving the encoding of tone transitions with respect to tone transitions in a reference line]

Definition statement

This subclass/group covers:

Differential coding, i.e. coding the change data between two lines.

H04N 1/4177

[N: encoding document change data, e.g. form drop out data]

Definition statement

This subclass/group covers:

Templates, encodes the data change only; encode difference of image when template is known, e.g. scanned images of filled out form sheets.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Color form drop-out	G06K 9/2018

H04N 1/419

in which encoding of the length of a succession of picture-elements of the same value along a scanning line is the only encoding step [N: H04N 1/4135 to H04N 1/417 take precedence]

Definition statement

This subclass/group covers:

B&W runlength encoding.

References relevant to classification in this group

This subclass/group does not cover:

Baseband signal showing more than two values or a continuously varying baseband signal is transmitted or recorded	H04N 1/4135
Systems or arrangements allowing the picture to be reproduced without loss or modification of picture-information using predictive or differential encoding	H04N 1/417

H04N 1/42

Systems for two-way working [N: e.g. conference systems (H04N 1/32 takes precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Circuits or arrangements for control or supervision between transmitter and receiver, see: H04N 1/32

Informative references

Attention is drawn to the following places, which may be of interest for search:

Television systems for two-way working	H04N 7/14

H04N 1/44

Secrecy systems

References relevant to classification in this group

This subclass/group does not cover:

Preventing unauthorised reproduction	H04N 1/00838

Informative references

Attention is drawn to the following places, which may be of interest for search:

Security arrangements for protecting computers or computer systems against unauthorised activity	G06F 21/00
Secret communication in general	H04K
Arrangements for secret or secure communication in transmission of digital information	H04L 9/00
Television secrecy systems	H04N 7/16

H04N 1/4406

[N: Restricting access, e.g. according to user identity (mechanisms actuated by cards, PIN or the like in apparatus for dispensing G07F 7/08)]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Restricting access to computer systems	**G06F21/00N5**
Access-control involving the use of a pass	G07C 9/00007
Access control in transmission of digital information	H04L 29/06823
Protecting transmitted digital information from access by third parties	H04L 29/06632
Verifying the identity or authority of a user of a system for the transmission of digital information	H04L 9/32

H04N 1/448

[N: Rendering the image unintelligible, e.g. scrambling]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Secret communication by adding a second signal to make the desired signal unintelligible	H04K 1/02
Systems rendering a television signal unintelligible and subsequently intelligible	H04N 7/167
Ciphering or deciphering apparatus for cryptographic purposes	G09C

H04N 1/4486

[N: using digital data encryption]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements for secret or secure communication using public key encryption algorithm	H04L 9/30

H04N 1/46

Colour picture communication systems [N: (colorimetry G01J 3/46)]

Definition statement

This subclass/group covers:

Colour edit systems, printers with different recording modes for color and monochrome, decision as to print/scan color or B&W, general color applications for fax. Very general group.

H04N 1/465

[N: Conversion of monochrome to colour]

Definition statement

This subclass/group covers:

Very straightforward, conversion into color documents, e.g. pattern chart to color (opposite to H04N 1/40012). Generating false color representations.

H04N 1/48

Picture signal generators (for halftone screening H04N 1/52)

Definition statement

This subclass/group covers:

Color image readers, hardware of apparatuses.

H04N 1/482

[N: using the same detector device sequentially for different colour components]

Definition statement

This subclass/group covers:

Filter wheels to separate components.

H04N 1/484

[N: with sequential colour illumination of the original]

Definition statement

This subclass/group covers:

The use of different lights to read the image, e.g. first R, then G, finally B, e.g. successive RGB LED lighting.

H04N 1/486

[N: with separate detectors, each detector being used for one specific colour component]

Definition statement

This subclass/group covers:

Using separate R, G and B sensor elements, typically line sensors. Has also documents on correcting chromatic aberrations of 3-line CCD sensor, also RGB sensor with additional monochrome sensor.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Demosaicing	G06T 3/4015, H04N 9/045
For area sensors (Bayer matrix)	H04N 9/04

H04N 1/488

[N: using beam-splitters]

Definition statement

This subclass/group covers:

Splitting light using prisms, half (dichroic) mirrors, diffraction grating - most applications deal with line sensors.

H04N 1/50

Picture reproducers (for halftone screening H04N 1/52)

Definition statement

This subclass/group covers:

Color printers, hardware of apparatuses.

H04N 1/502

[N: Reproducing the colour component signals dot-sequentially or simultaneously in a single or in adjacent picture-element positions]

Definition statement

This subclass/group covers:

Dot by dot printing, point-wise scanning, essentially either inkjet or laser beam printer.

Informative references

Attention is drawn to the following places, which may be of interest for search:

More details on inkjets	B41J 2/21

H04N 1/504

[N: Reproducing the colour component signals line-sequentially]

Definition statement

This subclass/group covers:

Line-by-line printing.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Alignment of dots	B41J 2/2135

H04N 1/506

[N: Reproducing the colour component signals picture-sequentially, e.g. with reproducing heads spaced apart from one another in the subscanning direction]

Definition statement

This subclass/group covers:

Picture-by-picture printing, i.e. one complete color separation after the other. Focus on image signal circuits, e.g. start-of-scan determination, sync marks on print medium, misregistration correction correcting misalignment of individual print heads with respect to each other. Facet or face-to-face errors. This is the typical way color laser printers work, when one latent image is generated after the other and one after the other developped and transferred.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Temperature	G02B 26/121
Purely mechanical corrections	**G09G15/01**
Trapping is also used against misregistration, but is an image modification	H04N 1/58

H04N 1/508

[N: using the same reproducing head for two or more colour components]

Definition statement

This subclass/group covers:

Using one drum for more than one color, thermal transfer printers.

H04N 1/52

Circuits or arrangements for halftone screening

Definition statement

This subclass/group covers:

Colour halftoning, colour multi-toning e.g. with use of more than one cyan (C1 and C2), screens, error diffusion.

Special rules of classification within this group

H04N 1/40087 or some subgroup of H04N 1/405 may be applied additionally to H04N 1/52.

H04N 1/54

Conversion of colour picture signals to a plurality of signals some of which represent particular mixed colours, e.g. for textile printing

Definition statement

This subclass/group covers:

Printing with additional colours, e.g. using orange and brown pigments additionally or white or gold, CMYKRGB printers.

H04N 1/56

Processing of colour picture signals (H04N 1/52 takes precedence)

Definition statement

This subclass/group covers:

General color image processing, color to 2-color converstion (e.g.. RGB to black/red). Film type, document type, slide type, text+image, detection of mouse marker.

References relevant to classification in this group

This subclass/group does not cover:

Circuits or arrangements for halftone screening	H04N 1/52

H04N 1/58

Edge or detail enhancement; Noise or error suppression, e.g. colour misregistration correction (H04N 1/62 takes

precedence)

Definition statement

This subclass/group covers:

Self-explanatory regarding noise and edge. A substantial part of this subgroup deals with trapping (spreading and choking image objects), either on bitmap or on page description language (PDL) level.

References relevant to classification in this group

This subclass/group does not cover:

Retouching, i.e. modification of isolated colours only or in isolated picture areas only	H04N 1/62

Informative references

Attention is drawn to the following places, which may be of interest for search:

For integration of trapping in PDL workflow	**G06K15/02B8H2**

H04N 1/60

Colour correction or control [N: (H04N 1/54 takes precedence)]

Definition statement

This subclass/group covers:

All kinds of color correction. Estimating spectrum from XYZ input.

References relevant to classification in this group

This subclass/group does not cover:

Conversion of colour picture signals to a plurality of signals some of which represent particular mixed colours	H04N 1/54

H04N 1/6011

[N: with simulation on a subsidiary picture reproducer(H04N 1/622 takes precedence; matching two or more picture reproducers H04N 1/6052)]

Definition statement

This subclass/group covers:

Color corrections involving representation of the image on monitor, e.g. for interactive correction or for use as soft proofer.

References relevant to classification in this group

This subclass/group does not cover:

Matching printer and monitor for softproofing per se	H04N 1/6052, H04N 1/6055
With simulation on a subsidiary picture reproducer	H04N 1/622

H04N 1/6013

[N: by simulating several colour corrected versions of the same image simultaneously on the same picture reproducer]

Definition statement

This subclass/group covers:

Fairly self-explanatory, typically the user selects one of the several similated, corrected images.

H04N 1/6016

[N: Conversion to subtractive colour signals]

Definition statement

This subclass/group covers:

Usually transformations from RGB to CMY, but also used generally for transformations to output device values, as far as the focus is on the transformation. Here (matrix) equations are used.

H04N 1/6019

[N: using look-up tables (H04N 1/6025 takes precedence)]

Definition statement

This subclass/group covers:

Look-up tables for color conversion, typically to CMY. Also interpolation methods to calculate the in-between values not stored in the tables, e.g. tetrahedal or cubic interpolations.

References relevant to classification in this group

This subclass/group does not cover:

Generating a fourth subtractive colour signal using look-up tables	H04N 1/6025

H04N 1/6022

[N: Generating a fourth subtractive colour signal, e.g. under colour removal, black masking]

Definition statement

This subclass/group covers:

Essentially the transformations to CMYK which involve use of equations. Gray component replacement (GCR), undercolor removal (UCR).

H04N 1/6025

[N: using look-up tables]

Definition statement

This subclass/group covers:

Four-colour look-up tables, also their interpolation.

H04N 1/6027

[N: Correction or control of colour gradation or colour contrast (H04N 1/6058 takes precedence)]

Definition statement

This subclass/group covers:

General control and correction of tone reproduction curves. Gray balance, white balance as result thereof. Aspects of saturation correction.

References relevant to classification in this group

This subclass/group does not cover:

Reduction of colour to a range of reproducible colours	H04N 1/6058

Informative references

Attention is drawn to the following places, which may be of interest for search:

When focus is on white balance per se.	H04N 1/6077
White balance in cameras	H04N 9/73

H04N 1/603

[N: controlled by characteristics of the picture signal generator or the picture reproducer]

Definition statement

This subclass/group covers:

Device profiles, e.g. ICC profiles, profile management for several devices, profile editing.

H04N 1/6033

[N: using test pattern analysis (H04N 1/6055 takes precedence)]

Definition statement

This subclass/group covers:

Printer or scanner calibration using color test patterns.

References relevant to classification in this group

This subclass/group does not cover:

Matching two or more picture signal generators or two or more picture reproducers using test pattern analysis	H04N 1/6055

Informative references

Attention is drawn to the following places, which may be of interest for search:

Color charts as such	**G01G3/52**
In electrophotography	**G03G15/00C**
For B&W	H04N 1/4078
Camera calibration	H04N 17/02

H04N 1/6052

[N: Matching two or more picture signal generators or two or more picture reproducers]

Definition statement

This subclass/group covers:

Specifically matching two (or more) devices to each other, e.g. for proofing, i.e. printer to printer or printer to monitor.

H04N 1/6055

[N: using test pattern analysis]

Definition statement

This subclass/group covers:

Limited to the two device scenario.

H04N 1/6058

[N: Reduction of colour to a range of reproducible colours, e.g. to ink- reproducible colour gamut]

Definition statement

This subclass/group covers:

Gamut mapping and gamut conversion. Mainly within a device-independent space in order to map color reproducability of one device onto that of another device.

Informative references

Attention is drawn to the following places, which may be of interest for search:

In relation to general image processing and computer graphics	G06T 11/001

H04N 1/6072

[N: adapting to different types of images, e.g. characters, graphs, black and white image portions]

Definition statement

This subclass/group covers:

Corrections to an image which depends on the type of image object, i.e. different corrections within one page, e.g. text and picture differently corrected.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Discrimination of image (object) types per se - (B&W),	H04N 1/40062
Discrimination of image (object) types per se - (colour).	H04N 1/56

H04N 1/6075

[N: Corrections to the hue]

Definition statement

This subclass/group covers:

Only hue changes, not luminance or chroma or saturation.

References relevant to classification in this group

This subclass/group does not cover:

Saturation correction	H04N 1/6027

H04N 1/6077

[N: Colour balance, e.g. colour cast correction]

Definition statement

This subclass/group covers:

Correction of e.g. color fog or blue shift in image.

Special rules of classification within this group

H04N 1/6027 has precedence.

H04N 1/608

[N: within the L, C1, C2 colour signals]

Definition statement

This subclass/group covers:

Eg. histogram technique in L*a*b* color space.

H04N 1/6083

[N: controlled by factors external to the apparatus]

Definition statement

This subclass/group covers:

Environmental factors.

H04N 1/6088

[N: by viewing conditions, i.e. conditions at picture output]

Definition statement

This subclass/group covers:

Eg. correction for sunlight on monitor, artifical lighting, flare.

H04N 1/6094

[N: depending on characteristics of the input medium, e.g. film type, newspaper]

Definition statement

This subclass/group covers:

Different film types have different properties, thus need to be corrected. For newspaper, correction due to the yellowing is necessary.

H04N 1/62

Retouching, i.e. modification of isolated colours only or in isolated picture areas only

Definition statement

This subclass/group covers:

Correction limited to particular colors, e.g. the red of a red apple is selected and enhanced. Changing color information in a region.

Informative references

Attention is drawn to the following places, which may be of interest for search:

For skin color	H04N 1/628

H04N 1/622

[N: with simulation on a subsidiary picture reproducer]

Definition statement

This subclass/group covers:
With display of image on monitor for user selection and editing.

H04N 1/64

Systems for the transmission or the storage of the colour picture signal; Details therefor, e.g. coding or decoding means therefor [N: (H04N 7/26 takes precedence)]

Definition statement

This subclass/group covers:
Colour coding closely related to apparatus.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Compression of B&W	H04N 1/41
Compression per se	H04N 7/26

H04N 1/642

[N: Adapting to different types of images, e.g. characters, graphs, black and white image portions]

References relevant to classification in this group

This subclass/group does not cover:

Similar but for colour correction and not coding	H04N 1/6072
For different coding for different image types, but limited to B&W	H04N 1/41

H04N 1/644

[N: using a reduced set of representative colours, e.g. each representing a particular range in a colour space]

Definition statement

This subclass/group covers:

Palletized colors, including methods of obtaining the palletization and their coding. Rounding, change from true color to 8bit using a pallette.

H04N 1/646

[N: Transmitting or storing colour television type signals, e.g. PAL, Lab; Their conversion into additive or subtractive colour signals or vice versa therefor (H04N 1/642, H04N 1/644 take precedence)]

Definition statement

This subclass/group covers:

Limited to e.g. YUV, Lab, etc.

References relevant to classification in this group

This subclass/group does not cover:

Adapting to different types of images, e.g. characters, graphs, black and white image portions	H04N 1/642
Using a reduced set of representative colours, e.g. each representing a particular range in a colour space	H04N 1/644

H04N 1/648

[N: Transmitting or storing the primary (additive or subtractive) colour signals; Compression thereof (H04N 1/642 to H04N 1/646 take precedence)]

Definition statement

This subclass/group covers:

Limited to CMY or RGB, raw sensor data.

References relevant to classification in this group

This subclass/group does not cover:

Adapting to different types of images, e.g. characters, graphs, black and white image portions	H04N 1/642
Transmitting or storing colour television type signals	H04N 1/646

Informative references

Attention is drawn to the following places, which may be of interest for search:

Demosaicing	G06T 3/4015, H04N 9/045

H04N 3/00

Scanning details of television systems

Definition statement

This subclass/group covers:

- Scanning arrangements using moving aperture, refractor, reflector or lens
- Scanning arrangements using switched light sources, solid-state devices or cathod-ray tube by deflecting elctron beams
- Scanning arrangements for motion picture films

H04N 5/00

Details of television systems (scanning details or combination thereof with generation of supply voltages H04N 3/00; specially adapted for colour television H04N 9/00; [N: servers specially adapted for the distribution of content H04N 21/20; client devices specially adapted for the reception of or interaction with content H04N 21/40])

Definition statement

This subclass/group covers:

Hardware-related or software-related aspects of television signal processing at the transmitter side or the receiver side

Relationship between large subject matter areas

- H04N 5/00 distinguishes itself from synchronising techniques in transmission of a digital video signal with one or more other digital signals, which are found in H04N 7/00
- H04N 5/00 distinguishes itself from picture signal processing and corresponding techniques, which are found in subclasses G06T, G09G. This concerns image processing not specific to a television signal (G06T) or video signal processing specific to visual displays (G09G), e.g. LCD or plasma panels
- H04N 5/00 features transmitter techniques specially adapted to analog transmission of television signals. The corresponding function place for generic transmission are found in subclasses H04N 21/00, H04B, H04H, H04L, H04W. This concerns servers, broadcast or multicast, home networks, wireless networks per se.
- H04N 5/00 features receiver techniques specially adapted to the reception of analog television signals. The corresponding place for digital television receivers is H04N 21/00.

References relevant to classification in this group

This subclass/group does not cover:

Constructional details related to the housing of computer displays	G06F 1/1601
Constructional details or arrangements for portable computers	G06F 1/1613
Diversity receivers	H04B 7/08
Broadcast receivers	H04H 20/38
Home automation networks	H04L 12/2803

Informative references

Attention is drawn to the following places, which may be of interest for search:

Power management in computer systems	G06F 1/3203
Image enhancement or restoration	G06T 5/00
Image analysis	G06T 7/00
Control arrangements or circuits, of interest only in connection with visual indicators other than cathode-ray tubes	G09G 3/00
Control arrangements or circuits for visual indicators common to cathode-ray tube indicators and other visual indicators	G09G 5/00
Broadcast synchronizing	H04H 20/18

Synchronizing in TDMA	H04J 3/06
Receiver synchronizing	H04L 7/0012, H04L 7/0083
Selective content distribution	H04N 21/00
Wall TV displays	H04N 9/12

Special rules of classification within this group

H04N 5/00 features a number of symbols corresponding to a same number of Indexing Codes (e.g., H04N 5/4448 as symbol and H04N 5/4448 as Indexing Code symbol).

Allocation of symbols and/or Indexing Code symbols:

- A document containing invention information relating to details of television elements will be given a H04N 5/00 group.
- A document containing additional information relating to details of television elements will be given a H04N 5/00 group.
- A document merely mentioning further details of television elements will not be given a group, but it may receive an Indexing Code if the disclosure is considered relevant, e.g. when conversion of interlace to progressive scanning (**H04N5/44V**) involves motion estimation, H04N 5/145 is added.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Edging	detection of edges
Movement estimation	motion vector generation

Synonyms and Keywords

In patent documents the following abbreviations are often used:

GPS	global positioning system
PC	personal computer
STB	set top box

H04N 5/222

Studio circuitry; Studio devices; Studio equipment; [N: Cameras comprising an electronic image sensor, e.g. digital cameras, video cameras, TV cameras, video cameras, camcorders, webcams, camera modules for embedding in other devices e.g. mobile phones, computers or vehicles]

Definition statement

This subclass/group covers:

Circuitry, devices and other equipment specially adapted to be used in television studio e.g. for mixing images or generation of special effects. This group covers further process and apparatus related to the concept of electronic image capturing using an electronic image sensor and the related control and processing of the generated electronic image signals

Image pickup devices using electronic image sensors (EIS) like e.g. digital cameras, video cameras, TV cameras, CCTV camera, surveillance camera, camcorders, digital cameras embedded in mobile phones, aspects peculiar to the presence of EIS in electronic still cameras, digital still cameras etc.

Electronic image capture by methods or arrangements involving at least the following step: the scanning of a picture, i.e. resolving the whole picture-containing area or scene into individual picture-elements and the derivation of picture-representative electric signals related thereto, simultaneously or in sequence, e.g. by reading an electronic solid-state image sensor (SSIS) pickup device (e.g. CCD or CMOS image sensor) as electronic image sensor converting optical image in formation into said electrical signals;

in colloquial speech said step is frequently formulated as e.g. capturing a video sequence, digital photographing, etc

Concerning cameras:

- video cameras, TV cameras (e.g. in studios), CCTV cameras, surveillance cameras, camcorders; constructional and mechanical details related to such cameras even when not peculiar to the presence of the EIS e.g. housings
- arrangements/methods for image capture using an electronic image sensor (EIS), i.e.((i) sensor read-out; (ii) processing or use of electrical image signals from the EIS for the generation of camera control signals,
- for controlling the EIS or its read-out for e.g. exposure, scene selection for auto focussing, or electronic image enhancement or processing of image signals captured by the EIS, e.g. white balance, electronic motion blur correction, noise suppressing,
- for controlling other camera functions, e.g. exposure, shaking by influencing optical parts of the camera, focussing,
- in-camera image processing e.g. correction of lens distortion, defect pixel correction, noise suppression, removal of motion blur, improving the dynamic range of the final image;

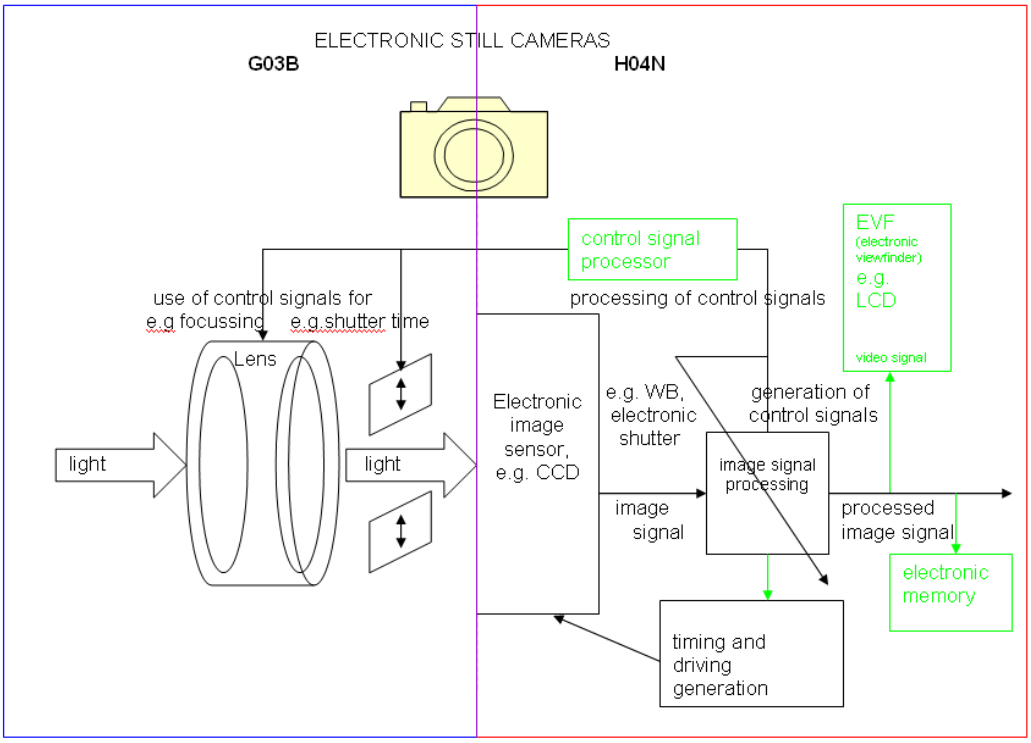
- electronic viewfinders, control of image pickup devices based on information displayed by the electronic viewfinder;
- electrical and mechanical aspects of camera modules using electronic image sensors and related constructional details as in webcams or mobile phones;
- remote control of cameras peculiar to the EIS, e.g. affecting their operation, or being based on a generated image signal;
- adaptations peculiar to the presence or use of an EIS, the transmission, recording or other use of electrical image data and related circuitry, e.g. mounting of EIS, integrated cleaning system for the EIS, dust mapping, cooling of the EIS, controlling the operation of the EIS by external input signals;
- cameras wherein the inventive contribution lies in the interaction of features covered above with those covered by G03B e.g. switch-over between electronic motion-blur correction of electronic viewfinder during focussing and optical motion-blur correction of the lens during exposure, electronic-motion blur correction of the electronic image signal based on output signals of additional sensor, or interaction between mechanical shutter and electronic control of the charge accumulation period of the EIS;
- applications concerning studios and image capturing devices that can not be classified in lower groups such as camera operation in general, like in studio or for TV events (sports,...), processing for simulating film look, virtual studio, virtual depth image, video assist system, other studio equipment e.g. prompter.

Relationship between large subject matter areas

Groups in G03B are to be considered when the following aspects are concerned:

- apparatus/methods for taking photographs using light sensitive film for image capture, apparatus/methods for printing, for projecting or viewing images using film stock, photographic film or slides by optical means, e.g. mounting of optical elements, flashes, and their related controls, e.g. exposure, focus, (opto-)mechanical motion blur (anti-shake), cooling, beam shaping;
- aspects of apparatus/methods for taking photographs using a electronic image sensor (EIS) for image capture, insofar as they correspond to those of said apparatus/methods for taking photographs using light sensitive film, i.e. insofar not peculiar to the presence or use of the EIS, e.g. mounting of optical elements or flashes, and their related controls insofar as they are not peculiar to the presence or use of the EIS, e.g. exposure, focus, (opto-)mechanical motion blur correction (anti-shake);
- optical viewfinders;
- remote control of cameras insofar not peculiar to the EIS, e.g. not affecting their operation, or being based on a generated image signal;
- optical aspects of camera modules using electronic image sensors and related constructional details (e.g. lens actuators)

The following scheme is intended to illustrate the relationship between H04N and G03B:



References relevant to classification in this group

This subclass/group does not cover:

Radiation diagnosis, diagnostic aspect of medical imaging devices	A61B, A61C
Pyrometry, measuring temperature	G01J 5/00
Measuring X-rays, gamma radiation	G01T 1/00
Image processing in general i.e. not being exclusively adapted to be used in an image pickup device containing an EIS or in studio devices or equipment	G06T
Structure of CMOS image sensors	H01L 27/146
Optical elements or arrangements associated with solid state imager structures	H01L 27/14625
Structure of CCD image sensors	H01L 27/148
Mounting structure in mobile phones	H04M 1/0264

Examples of places where the subject matter of this class is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Camera adapted for vehicles	B60R 1/00
Pattern recognition (e.g. details of face detection algorithms)	G06K 9/00
Surveillance systems with alarm	G08B 13/194 - G08B 13/196
Mobile phones	H04M 1/00
Videophones	H04N 7/14
Closed circuit television system	H04N 7/18

Informative references

Attention is drawn to the following places, which may be of interest for search:

Optical systems	G02B
Pattern recognition	G06K
Image processing	G06T
Editing of recorded image information	G11B 27/00
Solid state image structure	H01L 27/00
Broadcasting	H04H
Intermediate information storage using still video cameras	H04N 1/2112
Testing of cameras	H04N 17/00
Use of solid state image sensors	H04N 5/335
Video recording	H04N 5/76, H04N 9/76
Aspect related to colour cameras	H04N 9/04

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Photography	the process of recording pictures by means of capturing light on a light-sensitive medium, e.g. silver halide based chemical or an electronic image sensor. Light patterns reflected or emitted from objects expose such a light sensitive medium during a timed exposure, usually through a photographic lens in a device known as a camera

Camera	a device capturing image information represented by light patterns reflected or emitted from objects, and exposing a light sensitive film or an electronic image sensor during a timed exposure, usually through an optical lens, and producing an image on a light sensitive film or an electrical image information signal respectively
Projector	a device displaying image information by projection of light patterns, usually through an optical lens, wherein the light patterns are generated by illuminating an image, e.g. film or slide, or by converting an electric image signal into an optical signal using an electronic spatial light modulator
EIS	Electronic image sensor: optoelectronic transducer, converting optical image information into an electrical signal susceptible of being processed, stored, transmitted or displayed
Additional sensor	a sensor, other than the electronic image sensor, used for controlling a camera
ESLM	Electronic spatial light modulator: optoelectronic transducer converting electric signals representing image information into optical image information
Record	A registration (e.g. of sound or images) in permanent form by optical or electrical means for later reproduction

Synonyms and Keywords

In patent documents the following abbreviations are often used:

SSIS	Solid State Image Sensor
CCD	Charge-Coupled Device
APS	active pixel sensor
CDS	correlated double sensing
CMOS	Complementary metal–oxide–semiconductor
CIS	CMOS image sensor
AE	automatic exposure control
FPN	fixed pattern noise
NUC	non uniformity correction

HDR	high dynamic range
GUI	graphics user interface
AF	autofocus
AFE	analog front end
AGC	automatic gain control
DSP	digital signal processor
ENG	electronic news gathering
PTZ	pan tilt zoom
EVF	electronic viewfinder
OVF	optical viewfinder

In patent documents the following expressions/words "digital photography", "digital camera", "camcorder", "video camera", "still video", "camera" and "digital still camera" are often used as synonyms.

H04N 5/225

Television cameras [N: Cameras comprising an electronic image sensor, digital cameras, video cameras, camcorders, webcams, camera modules for embedding in other devices e.g. mobile phones, computers or vehicles (optical systems G02B; associated working of recording or reproducing apparatus with TV camera or receiver in which the television signal is not significantly involved G11B 31/006; tubes H01J)]

Definition statement

This subclass/group covers:

Constructional details of cameras (housing, mounting of optical parts, mounting of image sensing part, other camera parts). For example: camera module, endoscopes, borescopes.

References relevant to classification in this group

This subclass/group does not cover:

Constructional details not peculiar to the presence or use of the EIS in electronic still picture cameras, digital still picture camera.	G03B

Informative references

Attention is drawn to the following places, which may be of interest for search:

Optical systems	G02B
Associated working of recording or reproducing apparatus with TV camera or receiver in which the television signal is not significantly involved	G11B 31/006
Tubes	H01J

H04N 5/232

Devices for controlling television cameras, e.g. remote control; [N: Control of cameras comprising an electronic image sensor, e.g. digital cameras, video cameras, TV cameras, video cameras, camcorders, webcams, camera modules for embedding in e.g. mobile phones, computers or vehicles] (H04N 5/235 takes precedence; [N: varying magnification for cameras, e.g. angle of view, by optical means only G02B 7/00], G03B)

Definition statement

This subclass/group covers:

Internal and external camera control. For example, autofocus, computer aided image capture, camera with further processing without influencing image capture process, camera control programs, detect malfunction, dust removal, face recognition aid, GUI (graphics user interface), modes like viewfinder or playback mode, autofocus mode, video mode, still capture mode..., panoramic field of view, power saving or management, shutter delay, image capture speed, synthesis of images in camera, image resolution change, zoom, remote control, camera shake detection and correction, control via network, etc.

References relevant to classification in this group

This subclass/group does not cover:

Circuitry for compensating for variation in the brightness of the object	H04N 5/235

H04N 5/235

Circuitry [N: or methods] for compensating for variation in the

brightness of the object [N: based on an electric image signals provided by an electronic image sensor (exposure control for film cameras or cameras using an additional sensor G03B 7/00)]

Definition statement

This subclass/group covers:

Circuitry for compensating for variation in the brightness of the object. For example, dynamic range increase, bracketing, use of brightness histograms or brightness compensation by controlling shutter, filter, gain, illumination means, etc.

References relevant to classification in this group

This subclass/group does not cover:

Exposure control for film cameras or cameras using an additional sensor	G03B 7/00

H04N 5/247

Arrangements of television cameras [N: (constructional details of cameras H04N 5/2251; stereoscopic picture signal generators H04N 13/0239; H04N 13/0242)]

Definition statement

This subclass/group covers:

Systems using several cameras.

References relevant to classification in this group

This subclass/group does not cover:

Constructional details of cameras	H04N 5/2251

H04N 5/253

Picture signal generating by scanning motion picture films or slide opaques, e.g. for telecine (scanning details therefor H04N 3/36; [N: standard conversion therefor H04N 7/0112])

Definition statement

This subclass/group covers:

Picture signal generation by scanning motion picture films i.e. cinematographic films in video signals e.g. telecine.

References relevant to classification in this group

This subclass/group does not cover:

Scanning details therefor	H04N 3/36
Standards conversion therefor	H04N 7/0112

H04N 5/257

Picture signal generators using flying-spot scanners (H04N 5/253 takes precedence)

Definition statement

This subclass/group covers:

Obsolete technology.

References relevant to classification in this group

This subclass/group does not cover:

Picture signal generating by scanning motion picture films or slide opaques	H04N 5/253

H04N 5/262

Studio circuits, e.g. for mixing, switching-over, change of character of image, other special effect; [N: Cameras specially adapted for the electronic generation of special effects]

Definition statement

This subclass/group covers:

Studio circuits providing video special effects like combining different images, changing image aspect (geometric, orientation, etc.) or aesthetic/artistic aspect, providing transitions between images, background and foreground images synthesizing, mixing and switching.

H04N 5/28

Mobile studios

Definition statement

This subclass/group covers:

Mobile studios, e.g. television studio equipment installed in vehicles for outdoor broadcasting.

H04N 5/30

Transforming light or analogous information into electric information (H04N 5/222 takes precedence; scanning details H04N 3/00; light transforming elements H01J, H01L)

Definition statement

This subclass/group covers:

Photoelectric converting image sensors not classified in others subgroups.

References relevant to classification in this group

This subclass/group does not cover:

Light transforming elements	H01J, H01L
Scanning details	H04N 3/00
Studio circuitry; Studio devices; Studio equipment	H04N 5/222

H04N 5/32

Transforming X-rays [N: image transformers H01J 31/00]

Definition statement

This subclass/group covers:

Devices and applications with image sensors transforming X-rays.

References relevant to classification in this group

This subclass/group does not cover:

Image transformers	H01J 31/00

Informative references

Attention is drawn to the following places, which may be of interest for search:

Non-uniformity correction	H04N 5/357

H04N 5/33

Transforming infra-red radiation

Definition statement

This subclass/group covers:

Devices and applications with image sensors transforming infra-red radiation.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Non-uniformity correction	H04N 5/357

H04N 5/335

using solid-state image sensors [SSIS] (H04N 5/32, H04N 5/33 take precedence)

Definition statement

This subclass/group covers:

Circuitry and processing specific to e.g. CMOS or CCD solid state image sensors; includes particular sampling pattern e.g. windowing; includes noise correction e.g. defect pixels, dark current correction; includes particular functions achieved by scanning e.g. electronic shutter, control of the dynamic range.

References relevant to classification in this group

This subclass/group does not cover:

Transforming X-rays	H04N 5/32
Transforming infra-red radiation	H04N 5/33

Special rules of classification within this group

Groups H04N 5/335 to H04N 5/378 correspond to former ECLA groups H04N 5/2173-H04N 5/2176; H04N 5/335 and H04N 3/15-H04N 3/1568; they are presently being reclassified.

- In many case it is useful to supplement an identified function covered in the range [H04N 5/335-H04N 5/3675] with an Indexing Code corresponding to the sensor technology CCD/MOS covered in H04N 5/372, H04N 5/374 or H04N 5/3745. As an example a dark current correction for CCD would be classified in H04N 5/361 and additionally Indexing Code H04N 5/372.
- The sensor matrix defined in H04N 5/3745 is not meant to include the associated circuits. An A/D converter in an output register is classified in H04N 5/3742 or H04N 5/378 but not in H04N 5/37455.
- Although not always specific to SSIS the noise/distortion produced by a lens is nevertheless classified in H04N 5/3572 and not in H04N 5/217. This has been done to facilitate the search. Corrections of chromatic aberrations, which can also be related to lenses are classified in H04N 9/045. All other noise suppression or disturbance minimisation in picture signal generation e.g. in a camera having an EIS should be classified in H04N 5/217.
- Two groups specific to colour aspects are presently defined in H04N 5/3458 and H04N 5/3537, it avoids splitting an identical function between the H04N 5/335 and H04N 9/045.

H04N 5/76

Television signal recording (diagnosis, testing or measuring for television signal recorders H04N 17/06; recording in connection with measuring G01D; information storage [N: in which the television signal is not involved, driving, starting, stopping, head switching, editing, indexing] in general G11, e.g. G11B)

Definition statement

This subclass/group covers:

Video data recording:

- Specially adapted recording devices such as a VCR, PVR, high speed camera, camcorder or a specially adapted PC
- Interfaces between recording devices and other devices for input and/or output of video signals such as TVs, video cameras, other recording devices
- Video recorder programming
- Adaptations of the video signal for recording on specific recording media such as HDD, tape, drums, holographic support, semiconductor memories
- Adaptations for reproducing at a rate different from the recording rate such as trick play modes and stroboscopic recording
- Processing of the video signal for noise suppression, scrambling, field or frame skip, bandwidth reduction

- Impairing the picking up, for recording, of a projected video signal
- Regeneration of either a recorded video signal or for recording the video signal
- Video signal recording wherein the recorded video signal may be accompanied by none, one or more video signals (stereoscopic signals or video signals corresponding to different story lines)
- Production of a motion picture film from a television signal

Details specific to this group:

- The recording equipment is for personal use and not for studio use
- The subgroups H04N 5/92, H04N 5/93, H04N 5/94 and H04N 5/95 are for black and white (monochrome) video signals only while the remaining subgroups H04N 5/7605, H04N 5/765, H04N 5/78, H04N 5/80, H04N 5/84, H04N 5/89, H04N 5/903, H04N 5/907 and H04N 5/91 are for both black and white and colour video signals

Relationship between large subject matter areas

- The subject-matter in the range H04N 5/92 - H04N 5/956 deals with recording and processing for recording of only black and white video signals while H04N 9/79 - H04N 9/898 deals with recording and processing for recording colour video signals.
- H04N 5/76 (video recording) distinguishes itself from editing, which is found in G11B 27/00, in that the signals recorded and reproduced are video signals.
- H04N 5/76 is a function place for recording or processing for recording. H04N 21/433 describes applications for recording in a distribution system.
- H04N 5/76 features recording devices specially adapted to video data recording that can be programmed. The programming may be done by a user or a using an algorithm. Business methods where the video recording feature or step is well known is generally classified in **G06Q30/00A**.
- H04N 5/76 contains recording devices that are characterised by the connection to other devices through an interface. Typically information is sent or received by a recorder through an interface that impacts the recording or playback function. Interfaces in general are found in H04N 5/44.
- H04N 5/76 contains video cameras that record video data to a recording medium. Video cameras constructional details are found in H04N 5/225.
- H04N 5/76 is an application place for video data trick play. Reproducing data in general at a rate different from the recording rate is found in G11B 27/005.
- H04N 5/76 contains applications of video data processing for scrambling/encrypting video data for recording. Systems for rendering a video signal unintelligible are found in H04N 7/16 and H04N 21/00.
- H04N 5/76 is an application place for video data reduction for recording.

Video data compression is found in H04N 7/26.

References relevant to classification in this group

This subclass/group does not cover:

Video data processing for printing	G03F 1/00
Business methods related to the distribution of video data content	**G06Q30/00A**
Video editing	G11B 27/034
Recording techniques specially adapted to a recording medium for recording digital data in general	G11B 27/10
Control of video recorders where the video signal is not substantially involved	G11B 31/00
Video camera constructional details	**H04N4/225**
Network video distribution	**H04N5/24T6**
Production of a video signal from a motion picture film	H04N 5/253
Interfaces	H04N 5/44
User interface of set top boxes	H04N 5/44543
Video data coding	H04N 7/26

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Systems for buying and selling, i.a., video content	G06Q 30/00
Alarm system using video cameras	G08B 13/00
Selective content distribution	H04N 21/00
Controlling video cameras	H04N 5/232
Video surveillance	H04N 7/18

Special rules of classification within this group

H04N 5/76 features a small number of ECLA subdivisions and has an additional associated Indexing Code scheme **T04N576/00** (Indexing Code). A document does not explicitly mention that the video signal is a monochrome video signal is to be interpreted as being a colour video signal. As a

consequence some classes in H04N 5/76 specific to monochrome signal recording have fallen out of use. Instead the corresponding colour symbols should be given to such documents:

Allocation of EC symbols:

- A document containing invention information relating to video data recording will be given an H04N 5/76 EC group.
- A document containing additional information relating to video data recording (in particular, if the document discloses a detailed video recording device) will be given a H04N 5/76 Indexing Code symbol.
- A document containing invention information for more than one invention it may be given more than one H04N 5/76 EC group.
- A document merely mentioning recording will not be given an EC group, but it may receive an Indexing Code if the disclosure is considered relevant.

Allocation of Indexing Code symbols in combination with EC:

- When assigning H04N 5/76 as EC group, giving an additional Indexing Code is mandatory.

Combined use of Indexing Code symbols:

- Indexing Code symbols maybe allocated as necessary to describe additional information in document.

Symbol allocation rules:

- Documents defining recording devices that have an interface, e.g., connected to a network, should have at least one of the more specific H04N 5/765 Indexing Code symbols.
- Documents dealing with invention information about measures to prevent recording of projected images should be given the H04N 2005/91392 Indexing Code symbol.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Video or video data	Video signal, analogue or digital, with or without accompanying audio

H04N 5/772

[N: the recording apparatus and the television camera being placed in the same enclosure]

Definition statement

This subclass/group covers:
Video cameras as recording devices.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Television cameras	H04N 5/225

H04N 5/775

between a recording apparatus and a television receiver

Informative references

Attention is drawn to the following places, which may be of interest for search:

TV-receiver details	H04N 5/44
Recording/reproduction devices integrated in TV-receivers	H04N 5/445

H04N 5/781

on discs or drums

Definition statement

This subclass/group covers:
Magnetic disks.

H04N 5/782

on tape

Definition statement

This subclass/group covers:
Video recording programming applications, although it reads (recording) "on tape".

Video recorder programming (reservation recording).

H04N 5/783

Adaptations for reproducing at a rate different from the recording rate

Definition statement

This subclass/group covers:

- Trick play modes as well as processing for recording to enable the reproduction of video data at a rate different from the recording rate.
- High speed recording cameras.
- Speed control during recording, reproducing, reproducing at variable speed.

H04N 5/85

on discs or drums

Definition statement

This subclass/group covers:

Optical discs.

H04N 5/913

for scrambling; [N: for copy protection] (scrambling of a television signal for transmission H04N 7/167)

Definition statement

This subclass/group covers:

- Scrambling and encryption of video data for recording.
- Copy-protection systems.

Special rules of classification within this group

At least one Indexing Code H04N 5/913 symbol should be allocated to such document to further specify the scrambling method.

H04N 5/917

for bandwidth reduction (bandwidth reduction H04N 7/12; using pulse code modulation H04N 7/24)

Definition statement

This subclass/group covers:

Compression of analogue video signals.

References relevant to classification in this group

This subclass/group does not cover:

Compression of video signals	H04N 5/926, H04N 9/804

H04N 5/92

Transformation of the television signal for recording, e.g. modulation, frequency changing; Inverse transformation for playback [N: (transmitter circuitry H04N 5/38; receiver circuitry H04N 5/44)]

Definition statement

This subclass/group covers:

No longer used for classification

Special rules of classification within this group

The corresponding colour symbol should be allocated: H04N 9/82

H04N 5/93

Regeneration of the television signal or of selected parts thereof

Definition statement

This subclass/group covers:

No longer used for classification

Special rules of classification within this group

The corresponding colour symbol should be allocated: H04N 9/87

H04N 5/94

Signal drop-out compensation

Definition statement

This subclass/group covers:

No longer used for classification

Special rules of classification within this group

The corresponding colour symbol should be allocated: H04N 9/88

H04N 5/95

Time-base error compensation [N: (H04N 5/932 takes precedence)]

Definition statement

This subclass/group covers:

No longer used for classification

References relevant to classification in this group

This subclass/group does not cover:

Regeneration of analogue synchronisation signals	H04N 5/932

Special rules of classification within this group

The corresponding colour symbol should be allocated: H04N 9/89

H04N 7/00

Television systems (details H04N 3/00, H04N 5/00; systems specific to colour television H04N 11/00; stereoscopic television systems H04N 13/00; selective content distribution H04N 21/00)

Definition statement

This subclass/group covers:

- structural or hardware-related aspects of television systems, involving
- analogue television signals or digital television signals processed at low level (e.g. physical layer in the OSI model);
- details on conversion of television standards;
- circuits for recovering digital non-picture data in analogue television signals;
- specific arrangements allowing transmission of television signals via electric cables, optical fibres or using a GHz frequency band.

Relationship between large subject matter areas

H04N 5/00 covers details of television systems and circuitry for processing analogue television signals or digital television signals processed at pixel

level. Conversion between television standards and circuits for recovering digital non-picture data (slicers) are however classified in H04N 7/00.

H04N 9/00 and H04N 11/00 are to be considered when the focus is on colour aspects.

Aspects of diagnosis, testing and measuring for television systems are covered by H04N 17/00.

Television systems involving digital television signals not processed at low level should normally be classified in H04N 21/00.

Broadcast systems which are not specifically adapted for television signals should be classified in H04H.

Systems foreseen for the transmission/reception of data which may comprises inter alia television or video signals should be classified in respective telecommunication areas H04B, H04L, H04M and H04W.

General image processing not specific to television signals belongs to G06T. Video signal processing specific to visual displays belongs to G09G.

References relevant to classification in this group

This subclass/group does not cover:

Aspects of video games	A63F 13/00
Recognition of data in general	G06K
Image data processing or generation, in general	G06T
Combined visual and audible advertising or displaying, e.g. for public address	G09F 27/00
Broadcast communication in general	H04H
Systems specific to colour television	H04N 11/00
Stereoscopic television systems	H04N 13/00
Selective content distribution	H04N 21/00
Scanning details of television systems	H04N 3/00
Details of television systems	H04N 5/00
Details of systems specific to colour television	H04N 9/00
Wireless networks in general	H04W

Informative references

Attention is drawn to the following places, which may be of interest for search:

Instruments for performing medical examinations of the interior of cavities or tubes of the body by visual or photographical inspection, e.g. endoscopes	A61B 1/00
Arrangements in vehicles for holding or mounting or controlling radio sets, television sets, telephones, or the like	B60R 11/02
Mounting of cameras operative during drive (of a vehicle)	B60R 11/04
Arrangements for entertainment or communications for passenger or crew in aircraft, e.g. radio, television	B64D 11/0015
Commerce, e.g. shopping or e-commerce	G06Q 30/00
Remote control devices	G08C 17/00
Electrically-operated teaching apparatus or devices working with questions and answers	G09B 7/00
Simulators for teaching or training purposes	G09B 9/00
Miscellaneous advertising or display means not provided for elsewhere	G09F 19/00
Combined visual and audible advertising or displaying, e.g. for public address	G09F 27/00

Special rules of classification within this group

A document containing invention information relating to one of the subgroups will be given the relating EC symbol.

A document containing additional information relating to one of the subgroups will be given the relating Indexing Code.

A document merely mentioning a television system will not be given an EC symbol, but it may receive an Indexing Code if the disclosure is considered relevant.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

3:2 pull-down pattern	a pattern of images where the first image is repeated 3 times and the second image is repeated twice
HDTV	High Definition TeleVision
ISDN	Integrated Services Digital Network (ISDN): a circuit-switched telephone network system
Letter-box system	television system which displays images comprising a central part and black bars above and below the central part
MAC	Multiplexed Analogue Components (MAC): a satellite television transmission standard
Video signal	television signal

Synonyms and Keywords

In patent documents the following abbreviations are often used:

CRT	Cathode Ray Tube, a technology of display
CATV	Community Antenna Television
CCTV	Closed Circuit TeleVision
EPG	Electronic Programme Guide
GUI	Graphics User Interface
MATV	Master Antenna TeleVision
MPEG	Motion Picture Experts Group; a family of standards used for coding audio-visual information in a digital compressed format
PC	Personal Computer
PVR	Personal Video Recorder
STB	Set-Top Box
URL	Uniform Resource Locator
VOD	Video On Demand

H04N 7/002

[N: Special television systems not provided for by H04N 7/007 to H04N 7/18 (still pictures via a television channel

H04N 1/00098)]

References relevant to classification in this group

This subclass/group does not cover:

Transmission of still pictures via a television channel	H04N 1/00098

Places in relation to which this subgroup is residual:

Systems with supplementary picture signal insertion during a portion of the active part of a television signal, e.g. during top and bottom lines in a HDTV letter-box system	H04N 7/007
Conversion of standards	H04N 7/01
High-definition television systems	H04N 7/015
Systems for the transmission of digital non-picture data, e.g. of text during the active part of a television frame	H04N 7/025
Systems for the transmission of one television signal, i.e. both picture and sound, by a single carrier	H04N 7/04
Systems for the simultaneous transmission of one television signal, i.e. both picture and sound, by more than one carrier	H04N 7/06
Systems for the simultaneous or sequential transmission of more than one television signal, e.g. additional information signals, the signals occupying wholly or partially the same frequency band	H04N 7/08
Adaptations for transmission by electric cable	H04N 7/10
Systems in which the television signal is transmitted via one channel or a plurality of parallel channels, the bandwidth of each channel being less than the bandwidth of the television signal	H04N 7/12
Systems for two-way working	H04N 7/14
Analogue secrecy systems; Analogue subscription systems	H04N 7/16
Closed circuit television systems, i.e. systems in which the signal is not broadcast	H04N 7/18

Adaptations for transmission via a GHz frequency band, e.g. via satellite	H04N 7/20
Adaptations for optical transmission	H04N 7/22
Systems for the transmission of television signals using pulse code modulation	H04N 7/24

H04N 7/007

[N: Systems with supplementary picture signal insertion during a portion of the active part of a television signal, e.g. during top and bottom lines in a HDTV letter-box system]

Definition statement

This subclass/group covers:

- systems with auxiliary information data allowing improved picture quality transmitted during the active part of the TV signal, e.g. in black bands at the upper and lower edges of the picture;
- letter-box systems.

H04N 7/01

Conversion of standards [N: involving analogue television standards or digital television standards processed at pixel level (video transcoding H04N 7/26941; image scaling in general G06T 3/40; adapting incoming signals to the display format of the display terminal G09G 5/005)]

References relevant to classification in this group

This subclass/group does not cover:

Image scaling in general	G06T 3/40
Video signal processing specific to visual displays	G09G
Frame rate conversion for reducing blurring effect in a hold-type liquid crystal display (LCD)	G09G 2320/0257
Adapting incoming signals to the display format of the display terminal	G09G 5/005
Interpolation filters	H03H 17/0444 H03H 17/0657

Studio circuits for television systems involving alteration of picture size or orientation	H04N 5/2628
Saving bandwidth in low bit-rate video transmission	H04N 7/26893
Processing specific to video coder/decoder: transcoding to realise interoperability between different video coding standards	H04N 7/26941
Processing specific to video coder/decoder: subsampling at the coder and/or sample restitution by interpolation at the coder or decoder	H04N 7/46 H04N 7/465 H04N 7/467
Circuits specific for processing colour signals	H04N 9/64
Conversion of colour television standards	H04N 11/20

Informative references

Attention is drawn to the following places, which may be of interest for search:

Receiver circuitry for receiving on more than one standard at will	H04N 5/46

Synonyms and Keywords

In patent documents the following abbreviations are often used:

FRC	Frame Rate Converter
FRUC	Frame Rate Up-Converter
MC-FRC	Motion Compensation - Frame Rate Converter
NTSC	National Television System Committee
PAL	Phase alternating line
SECAM	Séquentiel couleur à mémoire (Sequential Colour with Memory)

H04N 7/015

High-definition television systems

Definition statement

This subclass/group covers:

- analogue high-definition systems;
- digital high-definition systems when they do not fall within the scope of other groups (H04N 13/00, H04N 19/00, H04N 21/00).

References relevant to classification in this group

This subclass/group does not cover:

Examples of places where the subject matter of this subgroup is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

High-definition colour television systems	**H04N11/24**

H04N 7/025

Systems for the transmission of digital non-picture data, e.g. of text during the active part of a television frame [N: (transmission of digital non-picture data during the vertical blanking interval only H04N 7/088)]

Definition statement

This subclass/group covers:

Systems using the active part of a television signal or part of it for transmitting digital non-picture data not foreseen to be watched as such on a display.

References relevant to classification in this group

This subclass/group does not cover:

Transmission of still pictures via a television channel	H04N 1/00098
Transmission of digital non-picture data during the vertical blanking interval	H04N 7/088

H04N 7/035

Circuits for the digital non-picture data signal, e.g. for slicing of the data signal, for regeneration of the data-clock signal, for error detection or correction of the data signal

Definition statement

This subclass/group covers:

- Circuits for recovering data transmitted during the non-active part of the television signal, e.g. vertical or horizontal blanking interval;
- Circuits for recovering data transmitted during the active part of the television signal instead of the pictorial signal.

H04N 7/04

Systems for the transmission of one television signal, i.e. both picture and sound, by a single carrier [N: (H04N 7/084, H04N 7/087 take precedence)

Definition statement

This subclass/group covers:

Systems for transmitting in a particular way both picture and sound by a single carrier.

References relevant to classification in this group

This subclass/group does not cover:

Systems for the transmission of more than one television signal of with signal insertion during the horizontal blanking interval	H04N 7/084
Systems for the transmission of more than one television signal of with signal insertion during the vertical blanking interval	H04N 7/087

H04N 7/06

Systems for the simultaneous transmission of one television signal, i.e. both picture and sound, by more than one carrier [N: (H04N 7/084, H04N 7/087 take precedence)]

Definition statement

This subclass/group covers:

Systems for transmitting in a particular way both picture and sound by more than one carrier.

References relevant to classification in this group

This subclass/group does not cover:

Systems for the transmission of more than one television signal of with signal insertion during the horizontal blanking interval	H04N 7/084
Systems for the transmission of more than one television signal of with signal insertion during the vertical blanking interval	H04N 7/087

H04N 7/08

Systems for the simultaneous or sequential transmission of more than one television signal, e.g. additional information signals, the signals occupying wholly or partially the same frequency band, [N: e.g. by time division (H04N 7/007 takes precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Examples of places where the subject matter of this subgroup is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Systems with supplementary picture signal insertion during a portion of the active part of a television signal, e.g. during top and bottom lines in a HDTV letter-box system	H04N 7/007

Synonyms and Keywords

In patent documents the following abbreviations are often used:

CC	Closed Caption
CRI	Clock Run-In
HBI	Horizontal Blanking Interval
RIC	Run-In Clock
VBI	Vertical Blanking Interval

H04N 7/10

Adaptations for transmission by electric cable (H04N 7/12 takes precedence; [N: transmission by lines H04B 3/00; wired

broadcast systems H04H 20/76; CATV (Community Antenna Television) systems H04H 20/78])

References relevant to classification in this group

This subclass/group does not cover:

Systems in which the television signal is transmitted via one channel or a plurality of parallel channels, the bandwidth of each channel being less than the bandwidth of the television signal	H04N 7/12

Informative references

Attention is drawn to the following places, which may be of interest for search:

Coaxial connectors for coaxial cables	**H01R17/12**
Networks for connecting several sources or loads, working on different frequencies or frequency bands, to a common load or source, particularly adapted for use in common antenna systems	H03H 7/461
Networks for connecting several sources or loads, working on the same frequency or frequency band, to a common load or source, particularly adapted for use in common antenna systems	H03H 7/482
Line transmission systems, in general	H04B 3/00
Repeater circuits for signals in two different frequency ranges transmitted in opposite directions over the same transmission path	H04B 3/38
Arrangements of wired systems for broadcast	H04H 20/76 H04H 60/93
CATV systems	H04H 20/78
Home automation networks	H04L 12/2803
Distribution of signals within a home automation network, e.g. involving splitting/multiplexing signals to/from different paths	H04L 12/2838

H04N 7/12

Systems in which the television signal is transmitted via one

channel or a plurality of parallel channels, the bandwidth of each channel being less than the bandwidth of the television signal (H04N 7/24 takes precedence; [N: by special scanning H04N 3/00]; high definition television systems H04N 7/015)

References relevant to classification in this group

This subclass/group does not cover:

Scanning details of television systems	H04N 3/00
High-definition television systems	H04N 7/015
Systems for the transmission of television signals using pulse code modulation	H04N 7/24

Examples of places where the subject matter of this subgroup is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Colour television systems with bandwidth reduction	H04N 11/02

H04N 7/14

Systems for two-way working ([N: H04N 7/12,] H04N 7/173 take precedence)

References relevant to classification in this group

This subclass/group does not cover:

Systems in which the television signal is transmitted via one channel or a plurality of parallel channels, the bandwidth of each channel being less than the bandwidth of the television signal	H04N 7/12
Systems with two-way working, e.g. subscriber sending a programme selection signal	H04N 7/173
Telephonic communication systems combined with television receiver for reception of entertainment or information matter	H04M 11/085

Examples of places where the subject matter of this subgroup is covered when specially adapted, used for a particular purpose, or incorporated in a

larger system:

Client devices specifically adapted for the reception of, or interaction with, content, e.g. STB [set-to-box]; Operations thereof	H04N 21/40

Informative references

Attention is drawn to the following places, which may be of interest for search:

Systems for two-way working in the scanning, transmission or reproduction of documents or the like	H04N 1/42

H04N 7/15

Conference systems ([N: video terminal details H04N 7/141]; telephonic conference arrangements H04M 3/56; [N: computer conferencing H04L 12/1813])

References relevant to classification in this group

This subclass/group does not cover:

Constructional details of the terminal equipment, e.g. arrangements of the camera and the display	H04N 7/142

Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements for conference in data switching networks	H04L 12/18
Telephonic conference arrangements	H04M 3/56
Multimedia conference systems	H04M 3/567

H04N 7/16

Analogue secrecy systems; Analogue subscription systems

Definition statement

This subclass/group covers:

Television systems, where transmitters such as head-ends distribute analog television signals to television receivers. Typically, the access to analog television information is restricted based on a subscription system, where the television viewer will be charged for accessing the programs he/she has selected. To prevent eavesdropping, the transmitted analog signals are scrambled by the transmitter, e.g. in the time or amplitude domain, and descrambled at reception. Such systems can work in a unidirectional mode, where the transmitter decides which analog television programs the subscriber is entitled to view or in a bidirectional mode, where the user can request to view a movie.

Relationship between large subject matter areas

Unidirectional or bidirectional television systems involving the distribution of digital video signals fall within the scope of H04N 21/00.

H04N 7/161

[N: Constructional details of the subscriber equipment (H04N 7/164 takes precedence; coin-freed and like apparatus in general G07F)])]

References relevant to classification in this group

This subclass/group does not cover:

Coin-freed and like apparatus in general	G07F
Coin-freed apparatus	H04N 7/164

H04N 7/162

[N: Authorising the user terminal, e.g. by paying; Registering the use of a subscription channel, e.g. billing]

Definition statement

This subclass/group covers:

- Entitlement systems, where the receiver is entitled to access the analog television program. Usually the user is billed therefor
- Analog conditional access systems

Informative references

Attention is drawn to the following places, which may be of interest for search:

Payment schemes	G06Q 20/00
E-commerce	G06Q 30/00

H04N 7/163

[N: by receiver means only]

Definition statement

This subclass/group covers:

Television programs are broadcast in a scrambled form and only receivers fitted with e.g. a conditional access card can descramble them.

H04N 7/165

[N: Centralised control of user terminal (subsequent to an upstream request signal H04N 7/17345); Registering at central (by two-way working H04N 7/17309)]

Definition statement

This subclass/group covers:

Systems where typically head-ends select which receivers are entitled to receive the analog television programs.

References relevant to classification in this group

This subclass/group does not cover:

Registering at central by two-way working	H04N 7/17309
Centralised control of user terminal subsequent to an upstream request signal	H04N 7/17345

H04N 7/167

Systems rendering the television signal unintelligible and subsequently intelligible [N: secret communication in general H04K 1/00]

Definition statement

This subclass/group covers:

- Systems operating in the time domain, e.g. by displacing synchronisation signals relative to active picture signals or vice versa or

by changing or reversing the order of active picture signal portions

- Systems operating in the amplitude domain, e.g. by modifying synchronisation signals or by inverting the polarity of active picture signal portions

References relevant to classification in this group

This subclass/group does not cover:

Secret communication in general	H04K 1/00

H04N 7/1675

[N: Providing digital key or authorisation information for generation or regeneration of the scrambling sequence (pseudo-random number generators in general G06F 7/58)]

Definition statement

This subclass/group covers:

Scrambling or descrambling of analog television signals based on digital keys

References relevant to classification in this group

This subclass/group does not cover:

Pseudo-random number generators in general	G06F 7/58
Computer security	G06F 21/00
Cryptography in general	H04L 9/00
Network security	H04L 29/06551

H04N 7/173

with two-way working, e.g. subscriber sending a programme selection signal

Definition statement

This subclass/group covers:

Bidirectional systems

H04N 7/17309

[N: Transmission or handling of upstream communications]

Definition statement

This subclass/group covers:

Details of analog signal processing, coding or modulating in the upstream channel

H04N 7/17318

[N: Direct or substantially direct transmission and handling of requests]

Definition statement

This subclass/group covers:

Typically on-demand systems for analog TV programs

H04N 7/17336

[N: Handling of requests in head-ends]

Definition statement

This subclass/group covers:

Details of analog Video-on-Demand servers

H04N 7/18

Closed circuit television systems, i.e. systems in which the signal is not broadcast [N: (television transmission of measured quantities G01D 5/39; intruder alarm or detection by television surveillance G08B 13/196, G08B15/00B)]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Instruments for performing medical examinations of the interior of cavities or tubes of the body combined with television appliances	A61B 1/04
Arrangements in vehicles for holding or mounting or controlling radio sets, television sets, telephones, or the like	B60R 11/02

Mounting of cameras operative during drive of a vehicle; Arrangements of control thereof relative to the vehicle	B60R 11/04
Arrangements for entertainment or communications for passenger or crew in aircraft, e.g. radio, television	B64D 11/0015
Scanning a visible indication of a measured value and reproducing this indication at a remote place, e.g. on the screen of a cathode-ray tube	G01D 5/39
Recognition of data in general	G06K
Image processing in general	G06T
Burglar, theft, or intruder alarms using television cameras	G08B 13/196
Signal generation from motion picture films	H04N 5/253

H04N 7/20

Adaptations for transmission via a GHz frequency band, e.g. via satellite

Informative references

Attention is drawn to the following places, which may be of interest for search:

Space-based or airborne stations for radio transmission systems	H04B 7/185
Arrangements of satellite networks for broadcast	H04H 20/74

H04N 7/22

Adaptations for optical transmission

Informative references

Attention is drawn to the following places, which may be of interest for search:

Transmission systems employing electromagnetic waves other than radio waves, e.g. light	H04B 10/00

Arrangements of optical systems for broadcast	H04H 20/69

H04N 7/24

Systems for the transmission of television signals using pulse code modulation (H04N 21/00 takes precedence)

References relevant to classification in this group

This subclass/group does not cover:

Selective content distribution, e.g. interactive television	H04N 21/00
Source coding or decoding of a digital video signal	H04N 7/26
Error protection or correction of a digital video signal	H04N 7/64

Special rules of classification within this group

H04N 21/00 takes precedence, except for source coding or decoding of a digital video signal (H04N 7/26 takes precedence in this case), and for error protection, detection or correction of a digital video signal (H04N 7/64 takes precedence in this case):

- in particular, for video bitstream assembling and disassembling, H04N 21/236 and H04N 21/434 take precedence;
- for channel coding and decoding of a digital video signal, H04N 21/2383 and H04N 21/4382 take precedence.

H04N 7/52

Systems for transmission of a pulse code modulated video signal with one or more other pulse code modulated signals, e.g. an audio signal or a synchronizing signal (assembling of a multiplex stream by combining a video stream with other content or additional data, remultiplexing of multiplex streams, insertion of stuffing bits into the multiplex stream, assembling of a packetised elementary stream at server side H04N 21/236; disassembling of a multiplex stream, remultiplexing of multiplex streams, extraction or processing of Service Information, disassembling of packetised elementary stream at client side H04N 21/434)

References relevant to classification in this group

This subclass/group does not cover:

Assembling of a multiplex stream, by combining a video stream with other content or additional data, remultiplexing of multiplex streams, insertion of stuffing bits into the multiplex stream, assembling of a packetised elementary stream at server side	H04N 21/236
Disassembling of a multiplex stream, remultiplexing of multiplex streams, extraction or processing of Service Information, disassembling of packetised elementary stream at client side	H04N 21/434

H04N 7/54

the signals being synchronous [N: (H04N 21/23602, H04N 21/23614, H04N 21/2365, H04N 21/2368, H04N 21/4341, H04N 21/4342, H04N 21/4347, H04N 21/4348 take precedence)]

Definition statement

This subclass/group covers:

older multiplexing/demultiplexing and transport technologies which were used before the introduction of MPEG system layer, based on a format, e.g. a frame format, usable for transmission or recording of compressed or uncompressed video data, possibly combined with other content, e.g. audio

References relevant to classification in this group

This subclass/group does not cover:

Multiplexing/demultiplexing of asynchronous signals, e.g. MPEG system layer type signals, involving the use of transport streams, program streams	H04N 21/236, H04N 21/434
Use of PCR for clock recovery	H04N 21/242, H04N 21/4305
Use of time stamps (PTS, DTS) for content synchronisation	H04N 21/242, H04N 21/4307

Special rules of classification within this group

Multiplexing/demultiplexing video and audio: H04N 21/2368, H04N 21/4341 take precedence;

multiplexing/demultiplexing video and additional data: H04N 21/23614,

H04N 21/4348 take precedence;

multiplexing/demultiplexing several video streams: H04N 21/2365,
H04N 21/4347 take precedence;

multiplexing/demultiplexing isochronously with video sync, e.g. according to bit-parallel or bit-serial interface formats, as SDI: H04N 21/23602,
H04N 21/4342 take precedence.

H04N 7/56

Synchronising systems therefor

Definition statement

This subclass/group covers:

Synchronisation for signals falling under H04N 7/54

References relevant to classification in this subgroup

This subclass/group does not cover:

Use of PCR for clock recovery	H04N 21/242, H04N 21/4305
Use of time stamps (PTS, DTS) for content synchronisation	H04N 21/242, H04N 21/4307

H04N 9/00

Details of colour television systems

Definition statement

This subclass/group covers:

- Picture signal generators
- Picture reproducers using opto-mechanical scanning, cathod-ray tubes, solid-state colour displays or projection devices
- Conversion of monochrome to colour image signals
- Colour synchronisation
- Processing brightness and chrominance signal in relation with each other
- Processing of colour signals in general as well as specifically for recording

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

ESLM	Electronic Spatial Light Modulator
DMD	Deformable mirror device
LCLV	Liquid Crystal Light Valve
D-ILA	Direct Drive Image Light Amplifier
HDR	High Dynamic Range
LCOS	Liquid Crystal On Silicon
DSP	Digital Signal Processor
DLP	Digital Light Processor
CRT	Cathode Ray Tube
RGB	Red Green Blue
CYM	Cyan Yellow Magenta

H04N 9/12

Picture reproducers (devices or arrangements for the electro-, magneto- or acousto-optical modulation or deflection of light beams G02F)

Definition statement

This subclass/group covers:

Video walls (excluding multi-projection displays)

References relevant to classification in this group

This subclass/group does not cover:

Video walls or multiscreen displays when each modular display is a projection device.	H04N 9/3147

H04N 9/29

using demagnetisation or compensation of external magnetic fields

Definition statement

This subclass/group covers:

Details of degaussing circuits.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Details of CRT or electron-beam tubes	H01J 29/003

H04N 9/31

Projection devices for colour picture display [N: e.g. using electronic spatial light modulators (ESLM) (projection devices using film stock, photographic film or slides, G03B 21/00 and subgroups)]

Definition statement

This subclass/group covers:

- Image projection using an electronic spatial light modulator [ESLM], i.e. processing of electrical image signals provided to the ESLM for the generation of projector control signals, for controlling the ESLM, e.g. control of the light source
- based on electronic image signal, light conditioning specially adapted for the ESLM
- in-projector image processing, electronic image data manipulation, e.g. during display or projection
- details of projectors peculiar to the use of an ESLM, e.g. dichroic
- and polarizing arrangements specially adapted for the ESLM
- remote control of projectors peculiar to the ESLM, e.g. affecting their operation, or based on a generated image signal;
- adaptations peculiar to the use of an ESLM and/or the display, the transmission, recording or other use of electrical image data
- and related circuitry, e.g. mounting of ESLM, integrated

Relationship between large subject matter areas

Subclass G03B contains subject-matter relating to the following aspects:

- Aspects of apparatus/methods for projecting or viewing images using an electronic spatial light modulator [ESLM], insofar as they correspond to those of said apparatus/methods for projecting or viewing images using film stock, photographic film or slides, i.e. insofar as not peculiar to the presence of the ESLM, e.g. mounting of optical elements not peculiar to the presence of the ESLM, and their related controls not peculiar to the presence of the ESLM, e.g. cooling, beam shaping, optical keystone correction;

- (opto-)mechanical image enhancement in printers or projectors (e.g. keystone correction);
- constructional aspects of projectors, e.g. cooling, beam shaping, light
- integrating means not peculiar to the ESLM;

Subclass G02B contains subject-matter relating to the following aspects:

- Optical image modulation using direction light control e.g. deformable mirror devices (DMD's),
- laser speckle optics,
- head-up projection displays (head-mounted displays).

Subclass G02F contains subject-matter relating to the following aspects:

- Control of light using liquid crystals.

Subclass G09F 9/00 contains subject-matter relating to the following aspects:

- Indicating arrangements for variable information (e.g. street or stadium displays).

References relevant to classification in this group

This subclass/group does not cover:

Optical systems in general	G02B
Dichroic and polarizing arrangements in general	G02B, G03B
Devices for controlling direction of light e.g. DMD's	G02B 26/08
Head-up displays	G02B 27/01
Speckle reduction	G02B 27/48
Film projectors	G03B 21/00
Details	G03B 21/14
Projection screens	G03B 21/56
Image processing per se	G06T
Displaying of variable information using colour tubes	G09G 1/28
Control of colour illumination sources	G09G 3/3413
Liquid crystal colour display with specific pixel layout	G09G 3/3607
Characterised by the way in which colour is displayed	G09G 5/02

Using circuits for interfacing with colour displays	G09G 5/04
Using colour palettes	G09G 5/06
3D picture reproducers	H04N 13/04

Informative references

Attention is drawn to the following places, which may be of interest for search:

Optical systems	G02B
Light control	G02F
Film projection and photography	G03B
Projection arrangements for image reproduction e.g. using eidophor	H04N 5/74 - H04N 5/7491

H04N 9/3129

[N: scanning a light beam on the display screen (scanning a light beam on a screen in displays other than projection devices G09G 3/02; scanning systems in general G02B 26/10; projectors using laser light sources in general H04N 9/3161]

Definition statement

This subclass/group covers:

Scanning projection devices wherein a light beam (e.g. a point beam or a linear beam from a laser or an LED) is scanned across a screen (e.g. using scanning mirrors).

Informative references

Attention is drawn to the following places, which may be of interest for search:

XY Scanning, scanning systems in general	G02B 26/10
Laser speckle optics	G02B 27/48
Semiconductors lasers	H01S 5/00
Projectors using laser light sources in general	H04N 9/3161

H04N 9/44

Colour synchronization

Definition statement

This subclass/group covers:

- Synchronisation of the modulated colour signal in relationship with the colour subcarrier,
- colour subcarrier generation in relationship with the extracted burst.

H04N 9/64

Circuits for processing colour signals (H04N 9/77 takes precedence)

Definition statement

This subclass/group covers:

- Color video sampling format conversion e.g. 4:2:2 to 4:2:0
- Gamut mapping and Colour Space Conversions
- Multiprimary colour signal conversion
- Colour sampling in digital video e.g. 4:4:4, 4:2:0, 4:1:1
- Processing of the modulated or demodulated colour television signal
- Input colour signal detection relating to the type and standard of colour signals
- Synchronous modulation and demodulation of the colour signals
- Image enhancement or disturbance suppression specific to the modulated or demodulated colour television signal
- Colour space transformation of the demodulated colour signal
- Amplitude contol and gamma control of the modulated or demodulated colour television signal
- DC contol control of the modulated colour television signal according to vertical blanking reference
- White balance control of the demodulated colour signal for display or at electronic image capture level
- Mixing of foreground and background colour video signals using chroma keying

Relationship between large subject matter areas

With respect to colour or chrominance aspects, subclass H04N 1/00 contains subject-matter relating to the following aspects:

- Aspects of apparatus/methods for controlling or correcting colour video signals originating from a scanned picture signal e.g. facsimile, document, photo.
- Subclass G06T contains subject-matter relating to the following aspects:

- General purpose data processing of an image or enhancement of such image not particularly adapted to a motion video signal
- Subclass H03D contains subject-matter relating to the following aspects:
- Demodulation of amplitude modulated signals

References relevant to classification in this group

This subclass/group does not cover:

Image processing per se	G06T
Amplitude modulated demodulation	H03D 1/00
Colour picture communication system	H04N 1/46

Informative references

Attention is drawn to the following places, which may be of interest for search:

Image processing, image enhancement	G06T
Amplitude demodulation	H03D
Colour picture signal processing	H04N 1/56
Facsimile colour picture signal processing	H04N 1/60
Colour television signal testing	H04N 17/02
Colour TV processing for recording	H04N 9/79

Special rules of classification within this group

Demodulation circuits adapted to a particular standard are classified in:

- H04N 11/146 for NTSC,
- H04N 11/165 for PAL, and
- H04N 11/186 for SECAM.

H04N 9/641

[N: Multi-purpose receivers, e.g. for auxiliary information (H04N 9/642 takes precedence)]

Definition statement

This subclass/group covers:

Circuits for multiple input selection or for selecting a particular colour signal type.

References relevant to classification in this group

This subclass/group does not cover:

Multi-standard receivers	H04N 9/642

H04N 9/642

[N: Multi-standard receivers]

Definition statement

This subclass/group covers:
Multistandard colour decoding circuits.

H04N 9/643

[N: Hue control means, e.g. flesh tone control]

Definition statement

This subclass/group covers:

- Face detection circuits,
- Hue control.

References relevant to classification in this group

This subclass/group does not cover:

Acquiring or recognising human faces, facial parts, facial sketches, facial expressions	G06K 9/00221

Informative references

Attention is drawn to the following places, which may be of interest for search:

Hue control relating to non moving picture signals	H04N 1/6075

H04N 9/66

for synchronous demodulators

Informative references

Attention is drawn to the following places, which may be of interest for search:

Demodulation circuits adapted to the NTSC standard	H04N 11/146
Demodulation circuits adapted to the PAL standard	H04N 11/165
Demodulation circuits adapted to the SECAM standard	H04N 11/186

H04N 9/67

for matrixing

Definition statement

This subclass/group covers:
Colour space transformation circuits.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Color space transformation circuits relating to non moving picture signals	H04N 1/6077

H04N 9/73

colour balance circuits, e.g. white balance circuits, colour temperature control

Definition statement

This subclass/group covers:
Colour balance control.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Color balance control relating to non moving picture signals	H04N 1/60

H04N 9/77

Circuits for processing the brightness signal and the chrominance signal relative to each other, e.g. adjusting the phase of the brightness signal relative to the colour signal, correcting differential gain or differential phase (circuits for matrixing H04N 9/67)

Definition statement

This subclass/group covers:

- Separation of luminance and chrominance signals from a multiplexed composite colour television signal
- Processing of luminance and chrominance signals in relationship to each-other (differential gain, differential phase, luminance and chrominance correlated enhancement or noise suppression ...)

H04N 9/79

Processing of colour television signals in connection with recording

Definition statement

This subclass/group covers:

Video data recording:

- Specially adapted recording devices such as a VCR, PVR, high speed camera, camcorder or a specially adapted PC
- Interfaces between recording devices and other devices for input and/or output of video signals such as TVs, video cameras, other recording devices
- Video recorder programming
- Adaptations of the video signal for recording on specific recording media such as HDD, tape, drums, holographic support, semiconductor memories
- Adaptations for reproducing at a rate different from the recording rate such as trick play modes and stroboscopic recording
- Processing of the video signal for noise suppression, scrambling, field or frame skip, bandwidth reduction
- Impairing the picking up, for recording, of a projected video signal
- Regeneration of either a recorded video signal or for recording the video signal
- Video signal recording wherein the recorded video signal may be accompanied by none, one or more video signals (stereoscopic signals or video signals corresponding to different story lines)
- Production of a motion picture film from a television signal

Details specific to this group:

- The recording equipment is for personal use and not for studio use
- The subgroups of H04N 9/79 are for colour video signals

Relationship between large subject matter areas

- Recording and processing for recording of video signals covered by the subject-matter in the range H04N 5/76 - H04N 5/907 is classified in said range irrespectively of said video signals being in colour or black and white.
- The range H04N 9/79 - H04N 9/898 deals with recording and processing for recording colour video signals while the corresponding range H04N 5/92 - H04N 5/956 deals with recording and processing for recording black and white video signals.
- H04N 9/79 (video recording) distinguishes itself from editing, which is found in G11B 27/00, in that the signals recorded and reproduced are video signals.
- **H04N5/79** is a function place for recording or processing for recording. H04N 21/433 describes applications for recording in a distribution system.
- H04N 9/79 features recording devices specially adapted to video data recording that can be programmed. The programming may be done by a user or a using an algorithm. Business methods where the video recording feature or step is well known is generally classified in **G06Q30/00A**.
- H04N 9/79 contains recording devices that are characterised by the connection to other devices through an interface. Typically information is sent or received by a recorder through an interface that impacts the recording or playback function. Interfaces in general are found in H04N 5/44.
- H04N 9/79 contains video cameras that record video data to a recording medium. Video cameras constructional details are found in H04N 5/225.
- H04N 9/79 is an application place for video data trick play. Reproducing data in general at a rate different from the recording rate is found in G11B 27/005.
- H04N 9/79 contains applications of video data processing for scrambling/encrypting video data for recording. Systems for rendering a video signal unintelligible are found in H04N 7/16 and H04N 21/00.
- H04N 9/79 is an application place for video data reduction for recording. Video data compression is found in H04N 7/26.

References relevant to classification in this group

This subclass/group does not cover:

Video data processing for printing	G03F 1/00

Business methods related to the distribution of video data content	**G06Q30/00A**
Video editing	G11B 27/034
Recording techniques specially adapted to a recording medium for recording digital data in general	G11B 27/10
Control of video recorders where the video signal is not substantially involved	G11B 31/00
Video camera constructional details	**H04N4/225**
Network video distribution	**H04N5/24T6**
Production of a video signal from a motion picture film	H04N 5/253
Interfaces	H04N 5/44
User interface of set top boxes	H04N 5/44543
Video data coding	H04N 7/26

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Systems for buying and selling, i.a., video content:	G06Q 30/00
Alarm system using video cameras	G08B 13/00
Selective content distribution	H04N 21/00
Controlling video cameras:	H04N 5/232
Video surveillance:	H04N 7/18

Special rules of classification within this group

H04N 9/79 features a small number of ECLA subdivisions and has an additional associated Indexing Code scheme **T04N576/00** (Indexing Code). A document does not explicitly mention that the video signal is a monochrome video signal is to be interpreted as being a colour video signal. As a consequence some classes in H04N 5/76 specific to monochrome signal recording have fallen out of use. Instead the corresponding colour symbols should be given to such documents.

Allocation of EC symbols:

- A document containing invention information relating to video data recording will be given an H04N 9/79 EC group.
- A document containing additional information relating to video data recording (in particular, if the document discloses a detailed video recording device) will be given a H04N 9/79 Indexing Code symbol.
- A document containing invention information for more than one invention it may be given more than one H04N 9/79 EC group.
- A document merely mentioning recording will not be given an EC group, but it may receive an Indexing Code if the disclosure is considered relevant.
- Allocation of Indexing Code symbols in combination with EC:
- When assigning H04N 9/79 or a subclass thereof as EC group, giving an additional Indexing Code is optional.
- Combined use of Indexing Code symbols:
- Indexing Code symbols maybe allocated as necessary to describe additional information in document.
- Symbol allocation rules:
- Documents defining recording devices that have an interface, e.g., connected to a network, should have at least one of the more specific H04N 5/765 Indexing Code symbols.
- Documents dealing with invention information about measures to prevent recording of projected images should be given the H04N 2005/91392 Indexing Code symbol.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Video or video data	video signal analogue or digital with or without accompanying audio

H04N 9/7925

[N: for more than one standard]

Special rules of classification within this group

The symbols H04N 9/7925 and corresponding H04N 9/7925 are not used. Instead documents that deal with the subject-matter of recording a plurality of video formats should be given the H04N 9/7921 or the corresponding H04N 9/7921 symbol.

H04N 9/8042

[N: involving data reduction]

Definition statement

This subclass/group covers:

Coding/decoding when done using an MPEG standard.

H04N 9/8205

[N: involving the multiplexing of an additional signal and the colour video signal]

Definition statement

This subclass/group covers:

Systems, where additional information, necessary to retrieve the video data, e.g., chapter marks, navigation packs, time stamps is recorded with the video information, either on the same recording medium or on an associated recording medium.

H04N 11/00

Colour television systems (details H04N 9/00)

Definition statement

This subclass/group covers:

Hardware-related or software-related aspects specific to transmission of colour television signal, in particular for transmission of analog colour television signal (e.g. NTSC, PAL, SECAM)

Relationship between large subject matter areas

H04N 11/00 distinguishes itself from transmission systems using pulse code modulation with bandwidth reduction, wherein the chrominance component or any type of colour component is submitted to a processing equivalent to the processing of the luminance component, e.g. MPEG standards, which are found in H04N 7/00, H04N 21/00.

References relevant to classification in this group

This subclass/group does not cover:

Colour picture communication systems	H04N 1/46

Informative references

Attention is drawn to the following places, which may be of interest for search:

High-definition television systems	H04N 7/015

Special rules of classification within this group

H04N 11/00 features a number of EC symbols corresponding to a same number of Indexing Codes (e.g., H04N 11/14 as EC symbol and H04N 11/14 as Indexing Code symbol)

Allocation of EC symbols and/or Indexing Code symbols:

A document containing invention information relating to colour television systems will be given a H04N 11/00 EC group

A document containing additional information relating to colour television systems will be given a H04N 11/00 EC group

A document merely mentioning details of colour television systems will not be given an EC group, but it may receive an Indexing Code if the disclosure is considered relevant.

H04N 13/00

Stereoscopic [N: or multiview] television systems; Details thereof

Definition statement

This subclass/group covers:

Systems where a three-dimensional effect or different views according to the viewpoint location are provided to one or more viewers by means of electronic signals representing a plurality of images or signals including depth information, e.g. taken from different viewpoint locations representing the interocular distance.

In particular, this group covers systems which :

- include electronic signal processing aspects, e.g. to provide signals for driving a stereoscopic display, or to generate signals by means of a stereoscopic camera; wherein
- said processing aspects are specially adapted to stereoscopic (or multiview) devices, i.e. different from the corresponding normal, non-stereoscopic aspects due to the presence of different pictures to be sent to the viewers' eyes.

Examples:

- Stereoscopic and multiview electronic image pick up devices (video cameras, digital still cameras)

- Stereoscopic and multiview display devices
- Electronic signal processors

- for stereoscopic television signal processing

- for monoscopic to stereoscopic conversion (including computer systems)

- for stereoscopic image generation (including from a computer model)

- for stereoscopic displays (e.g. left/right synchronization, stereoscopic format conversion, depth adaptation)

- for displays providing different 2D images to different viewers (e.g. for use in vehicles)

- for devices which generate a two-dimensional "look around" effect, e.g. non-stereoscopic multiview systems (see however exclusions here below).

- Devices generating a real 3D image, i.e. an image having a volume (volumetric displays)
- Pseudostereoscopic systems

Some systems falling under the definition set out above of "stereoscopic systems" but wherein the viewer's eyes do not see different images, may provide a pseudo-stereoscopic effect and are classified in H04N 13/00. The effect must go beyond that provided by the mere display of a 3D object on a 2D screen (like in a CAD system).

An Indexing Code (see below) is to be allocated to such systems, which in the main scheme are to be classified under the head group if no better class is found.

Example:Wiggle stereoscopy: pseudo-stereo systems providing a three-dimensional effect by means of normal 2D image signals, by periodic oscillating motion of a 3D object.

- Multiview systems:

- systems providing different 2D or 3D views of the same scene to one or more viewers according to the viewpoint location (called "look around" effect)

- systems providing different 2D or 3D views of different scenes to different viewers (called "privacy")

These systems are classified in H04N 13/00 if they provide said views simultaneously or at least at a high frame rate so as to be simultaneously viewed by the observers.

However, multiview systems wherein said 2D views are provided to a viewer one at a time, e.g. by user selection, are not classified in H04N 13/00, because they are actually normal 2D systems although the viewpoint can be selected at will.

Examples of multiview devices falling under H04N 13/00:

- the so called "look-around" display systems including display with lenticular screen providing different views of a common scene at different viewing positions

- the so called "privacy" display systems including display with parallax barrier providing different views of different scenes to different viewers in 2D or 3D (for example in a vehicule, wherein on a common screen the driver is watching GPS while the passenger is watching a movie)

- Multi-user displays displaying different pictures for different viewers wearing shutter glasses to select one of said pictures (this is also "privacy"), wherein said pictures are 2D or 3D pictures.

Relationship between large subject matter areas

Several sections in H04N 5/00 and H04N 7/00 relate to the basic monoscopic video aspects from which corresponding stereoscopic aspects are derived. Classification and search in these sections is therefore to be considered every time no specifically stereoscopic aspects are present.

G06T, image processing and generation in general, includes **G06T7/00X** which relates to stereoscopic image processing in general, i.e. not being adapted to be used with devices falling under H04N 13/00, e.g. stereoscopic image analysis, generation of depth values from stereoscopic images, stereoscopic image segmentation, generation of monoscopic images from stereoscopic images, etc.

Image processing adapted for driving or controlling stereoscopic image devices falling under H04N 13/00 may be classified in H04N 13/00 as well or even just in H04N 13/00. E.g. analysis of video signal to perform real time control of a stereoscopic video camera, or to identify the image transmission format to drive a stereoscopic display is classified just in H04N 13/00 if there are no image analysis aspects.

Sometimes a normal 2D display displaying solid objects, e.g. a CAD system wherein the viewer can rotate 3D objects to see them from any direction, is called "a 3D display". Of course such displays are not to be classified in H04N 13/00 because a viewer sees the same picture with both eyes and because, if there is more than one viewer, all viewers see the same picture. Such documents are classified in G06T 19/00.

Concerning G02B (optical systems), optical devices are often inextricably connected with the devices falling under H04N 13/00, because essential to provide the stereoscopic effect. Classification also in G02B should be considered every time a relevant optical aspect is present in a stereoscopic system. Classification only in G02B should be considered every time no electronic control aspects are present.

References relevant to classification in this group

This subclass/group does not cover:

Stereoscopic endoscopes	**A61B1/00R** G02B 23/2415
Arrangements for determining or recording eye movement (e.g. for gaze detection)	A61B 3/113
Printing stereoscopic images	B41M 3/06
Illumination with structured light for measuring contours or curvature of an object	G01B 11/25
Optical systems with means for monitoring data relating to the user, e.g. head-tracking, eye-tracking	G02B 27/0093
Head mounted displays	G02B 27/017
Optical systems for producing stereoscopic or other three dimensional effects	G02B 27/22
Spectacles having an electro-optical light valve (not switching at video field frequency)	G02C 7/101
Spectacles having passive polarizing filters	G02C 7/12
Stereoscopic film apparatus	G03B 35/00
Stereoscopic photographic or similar processes	G03C 9/00
Holographic imaging devices, even if providing a tv-like experience	G03H 1/00
Input/output in interaction with the human body (virtual reality)	G06F 3/011
Stereoscopic image processing in general, i.e. not being specially adapted to be used with devices falling under H04N 13/00, e.g. stereoscopic image analysis, generation of depth values from stereoscopic images, stereoscopic image segmentation, generation of monoscopic images from stereoscopic images	**G06T7/00X**
Stereoscopic television signal compression encoding, including stereoscopic and multiview signal encoding	H04N 19/00769

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Stereoscopic endoscopes and medical devices	A61B

Vehicle mounted cameras, including stereoscopic cameras	B60R 11/00

Informative references

Attention is drawn to the following places, which may be of interest for search:

Optical systems (comprising elements used in stereoscopic systems)	G02B 27/00
Calculation or rendering of a monoscopic view of a 3D graphics object	G06T 15/20
Generation of 3D graphical models or scenes	G06T 17/00
Video stream synchronization / multiplexing / packetization aspects	H04N 21/00
Video signal reformatting	H04N 21/4402 H04N 21/2343
Aspects concerning subtitles or other OSD information	H04N 21/488
Generation or processing of metadata	H04N 21/84
Television cameras	H04N 5/225
Arrangements of television cameras (not for capturing stereoscopic images)	H04N 5/247
Projection displays	H04N 5/74, H04N 9/31
Recording, including multiplexing another television signal	H04N 5/9205 H04N 9/8227
Video standard conversion	H04N 7/01
Colour signal processing circuits	H04N 9/64

Special rules of classification within this group

Classification of additional information corresponding to the contents of the orthogonal groups (see here below) is compulsory.If additional information relates to technical aspects which are not strictly connected with the main technical features classified, classification is not compulsory but advisable. On the other hand, embodiments equivalent to the main embodiments classified by default should not classified even if explicitly described; classification of the main embodiments is considered to be sufficient.

Example:

An invention concerning a time variant parallax barrier display is to be

classified in **H04N13/00A3B**. If there are colour aspects, H04N 13/0422 must be added. If in one of the embodiments the invention is applied to a lenticular screen display, addtional classification in **H04N13/00A1** is not considered to be necessary. If on the other hand one of the embodiments discloses aspects concerning image processing, classification in the relevant subgroups of H04N 13/0003 should be considered.

- Orthogonal groups

Some H04N 13/00 groups are to be regarded as "orthogonal", i.e. groups where stereoscopic aspects are classified as ECLA codes even though they are not strictly connected to the main teaching of the document (provided that such aspects are relevant), in order to make a search more efficient by AND-ing said codes with the codes relating to the main aspects. The orthogonal groups of each of the three main subsections H04N 13/0003, H04N 13/02 and H04N 13/04 are listed therein.

These groups are orthogonal to all groups.

Examples: see the above mentioned subsections.

- ECLA codes

In the past, ECLA codes were allocated with a kind of deep indexing system, i.e. any relevant aspect, even not strictly connected with the main teaching of the document, was given a corresponding ECLA code. There is therefore a large number of documents (provisionally) having quite many ECLA and Indexing Codes. This practice has been discontinued and should presently not be followed.

- Indexing Codes

In the past, Indexing Codes have been used during a reorganization made by students, wherein students allocated a set of Indexing Codes to be reviewed later by examiners. However, such codes were seldom removed by the examiners when the corresponding ECLA codes were allocated. There is therefore a large number of documents (provisionally) having identical ECLA and Indexing Codes, and even some irrelevant Indexing Codes. This practice has been discontinued and should presently not be followed. These Indexing Codes should be disregarded.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Stereoscopic	Providing (exactly) two different views, one for the left eye and one for the right eye
2D	Two dimensional

3D	Three dimensional, sometimes also used to mean stereoscopic
Autostereoscopic display	A display device not requiring glasses to provide a stereoscopic effect to the viewer
Multiview	Providing more than two different views to one or more viewers according to their viewing position or direction; the views can be 2D or 3D
Volumetric display	A device generating a "solid" image, i.e. not an image on the surface of a display, but one having a real depth. Such systems have been considered to fall within the definition of stereoscopic systems because the viewer's eyes perceive two different pictures.
Lenticular lens (screen)	An array of very thin cylindrical lenslets (normally less than 1mm wide) placed vertically in front or behind a display or light modulator in order to generate optically directive views in autostereoscopic displays / cameras
Parallax barrier	An array of very thin slits performing the same function of the lenticular screen; it may be electronically generated, switchable, adaptive, etc
Fly-eye lenticular screen	An array of very small bidimensional lenses (typically circular / hemispherical) placed in front of a display, light modulator or image sensor like a normal lenticular screen, providing bidimensional parallax
Pseudostereo(scopic) effect	Stereoscopic or 3D visual effect obtained without sending different views to the viewer's eyes; the same term is sometimes used to denote the effect due to a wrong viewer's position in front of an autostereoscopic effect, whereby the right image is seen by the left eye and vice versa
Integral imaging	A technique of image capture or display which uses a fly's eye or a lenticular screen in front of the image sensor/display in order to capture/display images with parallax
Plenoptic camera	A camera, normally non-stereoscopic, using a technique allowing focussing after image capture, by means of a lenticular lens array combined with a plurality of (small) image sensors
Light-field camera	See plenoptic camera

Synonyms and Keywords

In patent documents the following abbreviations are often used:

LCD	Liquid Crystal Display
SLM	Spatial Light Modulator
OSD	On-Screen Display
CAD	Computer Aided Design

In patent documents the terms "3D"and "stereoscopic" are sometimes used as synonyms.

The terms "lenticular screen", "lenticular lens array" and "lenticular array" are used as synonyms.

H04N 13/0003

[N: Stereoscopic image signal coding, multiplexing, processing, recording or transmission (television signal bandwidth reduction H04N 7/26; image coding for general purpose image data processing G06T 9/00; transformation of the video signal for recording, including multiplexing of another television signal H04N 5/9205; for colour signals, H04N 9/8227; selective content distribution, e.g. interactive television, VOD H04N 21/00; assembling of a multiplex stream, e.g. transport stream, by combining a video stream with other content or additional data, remultiplexing of multiplex streams, insertion of stuffing bits into the multiplex stream, assembling of a packetized elementary stream H04N 21/236; disassembling of a multiplex stream, e.g. demultiplexing audio and video streams or extraction of additional data from a video stream, remultiplexing of multiplex streams, extraction or processing of service information at client side, disassembling of packetized elementary stream H04N 21/434)]

Definition statement

This subclass/group covers:

Processing of stereoscopic image communication signals not strictly connected to the devices forming the subject of H04N 13/02 and H04N 13/04.

Special rules of classification within this group

Orthogonal groups (definition of orthogonal groups: see H04N 13/00) :

- colour aspects H04N 13/0037
- stereoscopic transmission H04N 13/0059
- recording / reproducing H04N 13/0055
- additional information concerning stereoscopic features (metadata) H04N 13/0062
- generation of intermediate viewpoints H04N 13/0011
- eye strain or flicker reduction aspects H04N 13/0033

It is however not excluded that in some cases one of the above groups may be assigned as the sole classification code.

As regards the H04N 13/00 Indexing Codes, see bullet point "Indexing Codes" in paragraph "Special rules of classification" here above.

The additional scheme H04N 2213/00 includes Indexing Codes **T04N213/00X** which relate to general aspects concerning the whole H04N 13/00.

Selected codes are listed here below.

H04N 2213/002 (Eyestrain reduction by processing stereoscopic signals or controlling stereoscopic devices)

This code is used to indicate eye strain aspects in general, i.e. not necessarily falling under the definition of H04N 13/0033. E.g. eye strain reduction not obtained by processing the stereoscopic video signal, but by controlling a display device so that disparity is reduced.

H04N 2213/003 and H04N 2213/005 (aspects relating to the "2D+depth" and

"3D+depth" image format)

This code is used to indicate that aspects concerning the above formats are present in a document. If a depth map is processed, H04N 13/0022 should be allocated.

Classification in these Indexing Codes is not mandatory.

H04N 2213/006 (Pseudostereoscopic systems)

See the bullet point "Pseudostereoscopic systems" in paragraph "Special rules of classification" here above.

Further classification information on subgroups of H04N 13/0003:

H04N 13/0011 (Transformation of stereoscopic image signals corresponding to virtual viewpoints):

Attention should be paid to the word "transformation": here a new virtual image is generated starting from one or more already existing stereoscopic images, e.g. by interpolation. A computer-generated new stereoscopic image not deriving from existing images is to be classified in H04N 13/0275.

H04N 13/0018 (Improving the 3D impression of a displayed stereoscopic image by modifying the image content):

If the content is not modified, this group is not relevant. E.g. if the 3D impression is improved by horizontally shifting one of the images with respect to the other, or by modifying the depth map, then the document should be classified in H04N 13/0022.

Examples of features which should be classified in this group (if their purpose is that indicated in the title):

- Addition of depth cues such as defocusing, coloring, shadows
- Geometric correction or warping
- Left/right or temporal crosstalk reduction

H04N 13/0022 (Aspects relating to depth or disparity adjustment):

This group comprises the documents dealing with depth adjustment. E.g.

- Control of disparity between L and R images
- Processing of depth map
- Non-linear processing of depth in order to adapt it to display features such as screen size

Aspects relating to eye strain (fatigue) reduction by reducing depth should be classified here and in H04N 13/0033 if they are independent from the display device, i.e. if depth is obtained by acting on the video signal and not on display features (in both cases, the Indexing Code H04N 2213/002 can additionally be allocated).

If depth adjustment is obtained by acting only on device parameters, i.e. there is no stereoscopic signal processing, the document should not be classified here but only in the relevant device groups, H04N 13/02 and H04N 13/04.

E.g. if depth is adjusted by controlling the baseline (the distance between two cameras of a stereo camera), it should be classified in H04N 13/0239 in combination with H04N 13/0296 (or possibly with H04N 13/0246).

H04N 13/0029 (Format conversion):

This group deals with the conversion of any kind of stereoscopic format into another one, e.g. from side-by-side to top-bottom or "2D+depth", or still to side-by-side but with a different size, resolution or frame rate.

Documents wherein a stereoscopic signal (format) is generated from monoscopic source signals should not be classified here but in H04N 13/0048 or in the relevant groups in H04N 13/02.

Aspects concerning format conversion should be classified here if (as for all processing aspects) they go beyond the equivalent processing of monoscopic tv signals, e.g. a PAL to NTSC conversion wherein no particular stereoscopic features are involved is to be classified in H04N 7/01 only.

H04N 13/004 (Mixing stereoscopic image signals):

This group deals with the generation of one image including the weighted sum of two source images, i.e. wherein the contents of both source images are visible (as opposed to overlaid pictures).

A window showing a second image within a first one (e.g. picture-in-picture) should be classified in H04N 13/0456.

Overlays such as subtitles and similar graphic images are to be classified in H04N 13/007.

H04N 13/0048 (Encoding, multiplexing or demultiplexing different image signal components in stereoscopic image signals):

This group deals with the structure of the stereoscopic video signal, i.e. how the different image signals which constitute a stereoscopic (or multiview) image signal are put together in order to form a complete video signal e.g. for storage or transmission. As for the preceding group, only stereoscopic features are classified - see the references in the note attached to the definition of this group for non-stereoscopic features.

As indicated in the ECLA definition of this group, "encoding" does not include compression encoding, which is to be classified in H04N 19/00769.

"Multiplexing" and "demultiplexing" are to be meant in the general sense mentioned above, i.e. any manner to form a stereoscopic image frame, stream or signal from e.g.

- left and the right signals
- a 2D image and a depth image

by arranging the components in a format having e.g.

- alternate L/R frames or fields
- side by side L/R images
- top/down L/R images
- main layer / enhancement layer
- component images having different resolutions

Further, attention should be paid to the term "image signal components" which is meant in a strict sense. Non-image signal components are to be classified in H04N 13/0062 and subgroups, however, due to the lack of a better place, documents comprising metadata or other non-image signal components were classified here till October 2011. Until the reorganization of H04N 13/00 is completed, a search for such aspects should include this group as well.

H04N 13/0055 (Recording or reproducing stereoscopic image signals),

H04N 13/0059 (Transmission of stereoscopic image signals):

These "orthogonal" groups are used to classify the corresponding aspects,

even though such aspects are often quite close to the corresponding monoscopic ones, because once a stereoscopic video stream has been assembled, it is generally recorded or transmitted with conventional techniques. Special attention should therefore be paid to the groups indicated in the note attached to these groups and to H04N 13/0003.

H04N 13/0066 (Metadata associated to a stereoscopic image signal):

Metadata concerning stereoscopic features included in a stereoscopic video stream or image file should be classified here. Other types of metadata are not to be taken into account, they are classified in H04N 21/00, see the note attached to this group and to H04N 13/0062.

Concerning non-stereoscopic metadata multiplexing, please see also the paragraph at the end of the note concerning H04N 13/0048.

H04N 13/007 (Subtitles or other OSD information associated to a stereoscopic image signal):

Stereoscopic features of subtitles or other OSD information included in a stereoscopic video stream (separate from the image(s)) should be classified here, e.g. how to three-dimensionally merge a subtitle with the main image, how to avoid depth conflicts, depth interference, etc.

The same comments made for metadata apply for non-stereoscopic aspects of these features.

H04N 13/02

Picture signal generators

Definition statement

This subclass/group covers:

- Devices for stereoscopic or multiview electronic image signal generation, including computer-generated stereoscopic image signals;
- Signal processing and control systems therefor.

Note:

The generated stereoscopic signals may be in any format, e.g. L + R, 2D + depth map, 3D + depth map. Note however that the devices which do not capture optical images (e.g. 3D scanners, time-of-flight cameras, rangefinders etc) are not classified in H04N 13/00: they are classified in the groups indicated here below.

Informative references

Attention is drawn to the following places, which may be of interest for search:

3D scanners	G06F 3/01
Time-of-flight [TOF] cameras	G01S 17/08
Depth or shape recovery	G06T 7/0051
Generation of a depth map from stereoscopic image signals	**G06T7/00X2**
Optical systems (comprising elements used in stereoscopic systems)	G02B 27/00
Calculation or rendering of a monoscopic view of a 3D graphics object	G06T 15/20
Generation of 3D graphical models or scenes	G06T 17/00
Video stream synchronization / multiplexing / packetization aspects	H04N 21/00
Video signal reformatting	H04N 21/4402 H04N 21/2343
Aspects concerning subtitles or other OSD information	H04N 21/488
Generation or processing of metadata	H04N 21/84
Television cameras	H04N 5/225
Arrangements of television cameras (not for capturing stereoscopic images)	H04N 5/247
Projection displays	H04N 5/74, H04N 9/31
Recording, including multiplexing another television signal	H04N 5/9205 H04N 9/8227
Video standard conversion	H04N 7/01
Colour signal processing circuits	H04N 9/64

Special rules of classification within this group

Examples of orthogonal groups:

- colour aspects H04N 13/0257
- synchronization and controlling aspects H04N 13/0296
- devices generating monoscopic and stereoscopic images H04N 13/0285 and H04N 13/0292
- multiview cameras H04N 13/0282

Plenoptic cameras which do not generate more than one viewpoint are to be classified in the relevant groups of H04N 5/00.

Plenoptic cameras / integral imaging cameras, which provide more than one

viewpoint, are to be classified in H04N 13/02, in particular in H04N 13/0282 if they provide more than two different geometrical viewpoints.

Further/other classes are allocated as normal, according to the special technical features of the device concerned, e.g. H04N 13/0232.

Further classification information on subgroups of H04N 13/02:

H04N 13/0232 (Stereoscopic cameras having a fly-eye lenticular screen):

Plenoptic cameras i.e. lens array cameras for providing stereoscopic or 3D images are classified here even if each lens of the fly-eye lenticular screen is placed on a different chip (the image sensor is considered to be one even if it is composite).

H04N 13/0246 (Calibration aspects relating to the control of a stereoscopic camera):

Aspects relating to the control of a stereoscopic camera in order to obtain aligned images, i.e. images which only differ by a horizontal disparity but have no rotation, or other geometric distortion therebetween. As indicated in the note attached to this group, the so-called stereo (camera) calibration aspects wherein an already captured image pair is processed to determine and compensate the same above mentioned distortions are to be classified in G06T 7/002, such aspects differing from the aspects classified in this group in that they do not "relate to the control of a stereoscopic camera".

H04N 13/0253 (Stereoscopic cameras in combination with an electromagnetic radiation source for illuminating the subject):

Only aspects relating to the use of light for obtaining a stereoscopic image are to be classified here, e.g. illumination with structured light in order to capture depth, illumination from different sides or with different colours for left and right images etc. Normal illumination devices (flash or continuous illumination) are classified in H04N 5/2256 and if exposure aspects are involved, in H04N 5/2354. If structured illumination is used for measuring contours or curvatures, see G01B 11/25.

H04N 13/026 (Stereoscopic picture signal generators with monoscopic to stereoscopic image conversion):

Devices obtaining a stereoscopic image from one or more existing monoscopic images are to be classified here. In this group the capturing conditions of the monoscopic images are unknown or irrelevant, whereas in H04N 13/0207 and subgroups stereoscopic images are generated from a camera controlled to provide images of different viewpoints, so that no "conversion" is necessary. There is thus no overlap between these two groups.

Please note that this group provisionally includes also the documents classified before 6/10/2011 which, in the present new scheme, should be classified in its subgroups. These documents will be reclassified in due time.

H04N 13/0275 (Stereoscopic picture signal generation from a 3D object model, e.g. computer generated stereoscopic image signals):

This group and its subgroup H04N 13/0278 relate to systems using a computer for generating a stereoscopic image, e.g. a fully synthetic stereoscopic image from a CAD-type 3D object model. Note that the generation of a virtual image starting from already existing stereoscopic images is to be classified in H04N 13/0011 and subgroups. Attention should be paid to this detail in order to decide whether to search / classify in this group.

H04N 13/0285 and N (Stereoscopic picture signal generators generating monoscopic and stereoscopic images):

Please note that H04N 13/0292 provisionally includes also the documents classified before 6/10/2011 which, in the present new scheme, should be classified in H04N 13/0285 and M1. These documents will be reclassified in due time.

H04N 13/04

Picture reproducers [N: (optical systems for producing stereoscopic or other three dimensional effects G02B 27/22)]

Definition statement

This subclass/group covers:

- Devices for stereoscopic or multiview electronic image signal display;
- Devices for volumetric three dimensional electronic image signal display;
- Signal processing and control systems therefor.

Attention should be paid to the optical structure and optical devices of some stereoscopic displays (e.g. those provided with lenticular screens), which are to be classified and searched also (or exclusively) in G02B 27/22.

Special rules of classification within this group

Image processing specially adapted for use with a specific display device should be classified in this section, not in H04N 13/0003. E.g. signal multiplexing (interlacing) for displaying a stereoscopic input signal by means of a lenticular screen display is classified in H04N 13/0404; however, if the multiplexed signal is not just used within the display but e.g. created to be transmitted elsewhere, then H04N 13/0048 should be added.

Several H04N 13/04 sections are to be regarded as "orthogonal" groups (see the corresponding note of H04N 13/00). Examples:

- Colour aspects H04N 13/0422
- Display with slanted parallax optics H04N 13/0415

- Multiview displays H04N 13/0445
- Displays with viewer tracking H04N 13/0468
- Calibration aspects H04N 13/0425
- Aspects relating to the presence of digital micro mirror devices or of a half transparent mirror or screen H04N 13/0427
- Aspects relating to the generation of monoscopic and stereoscopic images H04N 13/0452 and H04N 13/0456
- Synchronization or controlling aspects H04N 13/0497

It is however not excluded that in some cases one of the above groups may be assigned as the sole classification code.

Besides codes corresponding to the H04N 13/00 codes, the Indexing Code scheme further comprises the following three Indexing Codes:

T04N13/00S, **T04N13/00S1** and **T04N13/00S2**

which relate to the so-called "Privacy" aspects i.e. devices displaying different images to different viewers, the images not being different viewpoints of the same scene. A typical example of such systems is a display used in vehicles wherein the driver sees navigation-related information whereas the passenger sees a TV film.

As regards the additional scheme H04N 2213/00, section **T04N213/04** relates to aspects concerning displays. It includes the following two Indexing Codes:

H04N 2213/007 (Aspects relating to detection of stereoscopic image format)

This is typically made by analysis of the video signal or detection of embedded metadata e.g. to ascertain if a received stereoscopic signal is compatible with a display device (if it's not compatible, and it is converted to a compatible format, then H04N 13/0029 should additionally be allocated).

H04N 2213/008 (Aspects relating to glasses for viewing stereoscopic images): Here typically shutter glasses or polarizing glasses are meant. Note that only non-trivial aspects should be classified here, i.e. not all documents where shutter glasses are driven or synchronized. E.g. this Indexing Code should be allocated to documents dealing with glasses having integrated devices providing power supply for the LCD shutters, or comprising special synchronization receivers capable of driving the glasses in absence of a continuous sync signal from the display.

Further classification information on subgroups of H04N 13/04

H04N 13/0415 (Autostereoscopic displays with slanted parallax optics):

By "slanted parallax optics" it is meant a lenticular screen or parallax barrier placed at an angle with respect to the pixel columns of the display, so that a cylindrical lenslet of the lenticular array or a slit of the parallax barrier overlap more than one pixel column.

Note that this group is "orthogonal" - a slanted lenticular screen display will be

classified in H04N 13/0404 and here.

H04N 13/0418 (Autostereoscopic displays using an array of controllable light sources or a moving aperture or light source):

Here are to be classified displays working on the principle of using an illumination source (e.g. a collimated light beam illuminating a light modulator) to provide directivity to the light emitted by the display, so as to direct an image to one viewer's eye. Typically, the emitted light direction is changed by controlling the position of the illumination source.

H04N 13/0438 (Temporally multiplexed displays):

Here are to be classified those displays working on the principle of temporally (alternatively) switching one or more pictures and using synchronized spectacles to select the picture to be sent to a viewer's eye. Note that polarization switching is to be classified here since all other H04N 13/0429 subgroups relate to spatially multiplexed displays.

The search for devices using passive polarizing glasses is therefore to be performed both in H04N 13/0434 and in this group.

H04N 13/0445 (Multiview displays, i.e. displays generating more than two geometrical viewpoints without observer tracking):

This is a "orthogonal group". Please note that this group provisionally includes also the documents classified before 6/10/2011 which, in the present new scheme, should be classified in its subgroups. These documents will be reclassified in due time.

H04N 13/0452 and N (Stereoscopic displays generating monoscopic and stereoscopic images):

Please note that H04N 13/0456 provisionally includes also the documents classified before 6/10/2011 which, in the present new scheme, should be classified in H04N 13/0452 and M1. These documents will be reclassified in due time.

H04N 17/00

Diagnosis, testing or measuring for television systems or their details

Definition statement

This subclass/group covers:

Hardware-related or software-related aspects specific to measuring or testing of values involved in the television signal processing at the transmitter side and/or the receiver side, for analog or digital television signal.

Relationship between large subject matter areas

H04N 17/00 features test techniques for all the devices which belong to the television chain: television cameras, transmission path, television receivers or recorders, distribution systems which are found in H04N 5/00, H04N 7/00, H04N 9/00, H04N 11/00, H04N 21/00.

References relevant to classification in this group

This subclass/group does not cover:

Monitoring or testing of transmitters/receivers in general	H04B 17/00 H04H 20/12 G06F 11/34

Informative references

Attention is drawn to the following places, which may be of interest for search:

Electronic inspection or testing of displays and display drivers, e.g. of LED or LCD displays	G09G 3/006

Special rules of classification within this group

H04N 17/00 features a limited number of EC symbols and has an associated Indexing Code scheme with additional subdivisions: H04N 17/00

Allocation of EC symbols and/or Indexing Code symbols:

- a document containing invention information relating to testing of television systems or details will be given a H04N 17/00 EC group
- a document containing additional information relating to testing of television systems or details will be given a H04N 17/00 EC group
- a document merely mentioning details of colour television systems will not be given an EC group, but it may receive an Indexing Code if the disclosure is considered relevant.

Monitoring aspects are also covered in the appropriate main groups, e.g. H04N 5/00, H04N 7/00, H04N 21/00.

H04N 19/00

[N: Methods or arrangements for coding, decoding, compressing or decompressing digital video signals]

Definition statement

This subclass/group covers:

- Methods or arrangements of digital video coding and compression of an input digital video sequence for the purpose of further transmission (e.g. by broadcasting) or of storage (e.g. at servers, set-top boxes or hard-disks) and further reproduction at viewer premises.
- Certain subgroups are related to the standards H.261 to H.264, MPEG-1 to MPEG-4, AVC, to the draft standards SVC, HEVC and to future related standards.
- Methods or arrangements for transform coding of static images suitable for compression of digital video signals, e.g. related to the standards JPEG, JPEG 2000, in view of the close technical relationship with the cited standards, are also covered by said special subgroups.

Relationship between large subject matter areas

The scope of H04N 19/00 and its subgroups is limited to the part of digital video coding and compression strictly comprised between the digital video input and the compressed video output that provides digital coded video to further processing stages such as transmission and storage, i.e. it is limited only to the generation of the elementary video stream, e.g. as defined by the MPEG standards.

- Processing stages after the compressed video output (e.g. fragmentation in packet units, encapsulation, medium adaptation for transport, video distribution) are generally covered by H04N 21/00 or H04H and processing stages before the digital video input or after decoding (e.g. resampling, interpolation, cropping, rotation) are generally covered by G06T, unless their operation is interactive with functional units of the compressor generating the elementary video stream and is consequently covered also by specific subgroups of H04N 19/00.
- Computer graphics compression is covered by G06T 9/00.
- General compression algorithms are covered by H03M 7/00.
- Processing of documents or images for scanning, transmission or reproduction (e.g. telefax) is covered by H04N 1/00.
- Details of digital television cameras, digital television receivers and digital video recorders are covered by H04N 5/00.

References relevant to classification in this group

This subclass/group does not cover:

Audio Analysis or Processing	G10L 19/00

Informative references

Attention is drawn to the following places, which may be of interest for search:

Information retrieval and database structures therefor in image databases	G06F 17/30244
Pattern recognition (characters, fingerprints)	G06K 9/00
Hardware for image processing	G06T 1/00
2D image generation	G06T 11/00
2D image animation (e.g. sprites in general)	G06T 13/00
3D image rendering	G06T 15/00
3D image modelling	G06T 17/00
Image or sequence resampling in general	G06T 3/00
Image restoration	G06T 5/00
Image analysis, e.g. analysis of motion	G06T 7/00
Computer graphics compression	G06T 9/00
Signal processing for video editing and recording on a special recording medium	G11B 27/00
General data coding	H03M
Details of multimedia broadcast systems	H04H
Processing of documents or images for scanning, transmission or reproduction (e.g. telefax)	H04N 1/00
Compression of two-tone or discrete tone static images (e.g. fax transmission, compression in JBIG, GIF or PNG format)	H04N 1/41
Colour conversion	H04N 1/60
Stereoscopic or multiview television systems	H04N 13/00
Diagnosis, testing or measuring for television systems	H04N 17/00
Selective content distribution	H04N 21/00
Video cameras	H04N 5/222
Studio equipments	H04N 5/232
Television receivers	H04N 5/44
Video recording and play (e.g. trick play)	H04N 5/76
Closed circuit TV systems, details of video-surveillance cameras and circuits	H04N 7/18

Special rules of classification within this group

In this group, it is appropriate to use multi-aspect classification, because the subject of the invention generally relates to the interaction or interrelationship of different technical aspects, each provided for in this main group, wherein all those different aspects are to be classified.

The classification should be directed at non trivial aspects only. Aspects not necessarily interacting with the claimed aspects are also classified.

The description and the figures should be object of the classification, and not only the claims.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

MPEG	Moving Picture Experts Group
JPEG	Joint Photographic Experts Group
AVC	Advanced Video Coding
SVC	Scalable Video Coding
HEVC	High Efficiency Video Coding

H04N 19/00006

[N: using adaptive coding]

Definition statement

This subclass/group covers:

Static or dynamic adaptation in the interaction of the different building blocks or processes of the digital video compressor or decompressor, e.g. regulation of the parameters involved in the compression algorithm as a function of the channel capacity or of the desired quality of the reconstructed video signal.

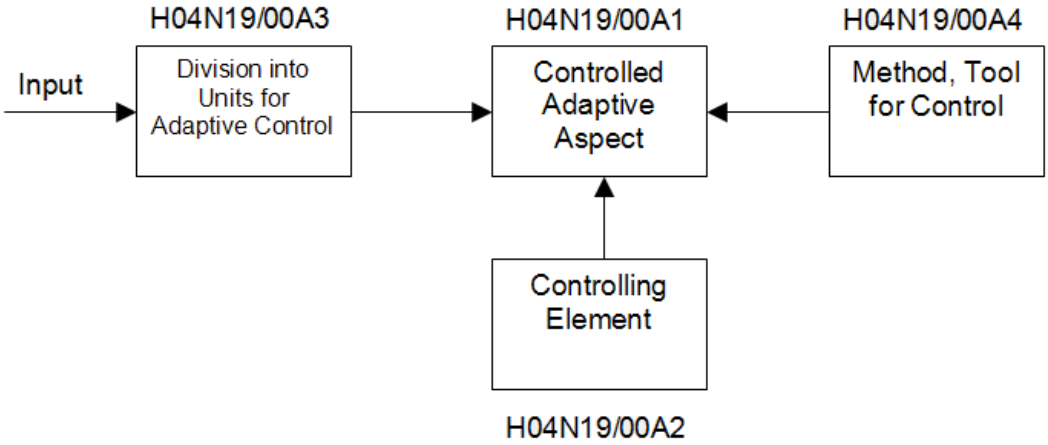
Informative references

Attention is drawn to the following places, which may be of interest for search:

Controlling the complexity of the video stream at the transmitter side, e.g. by scaling the resolution or bitrate of the video stream	H04N 21/2662
Controlling the complexity of the video stream at the receiver side, e.g. by scaling the resolution or bitrate of the video stream	H04N 21/4621

Special rules of classification within this group

Each adaptive coding aspect should, as far as possible, be classified with entries from each one of the H04N 19/00012, H04N 19/00133, H04N 19/00254 and H04N 19/00345 subgroups.



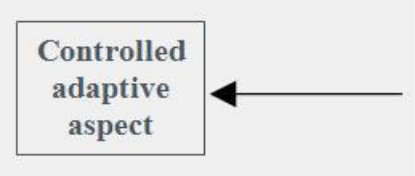
H04N 19/00012

[N: characterised by an element, parameter or selection affected, i.e. controlled, by the adaptive coding]

Definition statement

This subclass/group covers:

The definition of the element, parameter or selection, which is affected by the adaptive coding, wherein element is to be understood as a functional block or process in the digital video compressor or decompressor.



H04N 19/00018

[N: Coding or prediction mode selection]

Definition statement

This subclass/group covers:

The selection of the coding mode or of the prediction mode, as provided in detail in the lower-ranking subgroups.

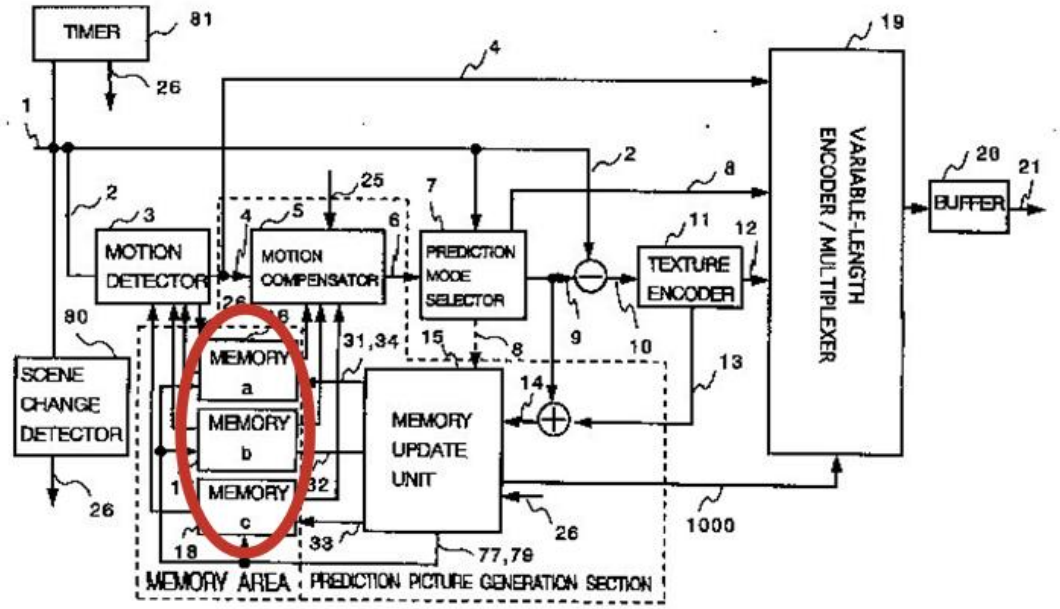
H04N 19/00024

[N: Selection of the reference unit for prediction within a chosen coding or prediction mode, e.g. weighted prediction or adaptive choice of position and number of pixels used for prediction]

Definition statement

This subclass/group covers:

The selection of the reference unit for prediction within a chosen coding or prediction mode, e.g. weighted prediction or adaptive choice of position and number of pixels used for prediction, choice between different motion estimators or compensators (e.g. between diamond search and full search, between global and local motion compensation), adaptive choice of the reference frame or block in motion compensation, e.g. as in the figure below.



Informative references

Attention is drawn to the following places, which may be of interest for search:

Multiple frame prediction	H04N 19/00715
Bidirectional image interpolation, B-frames	H04N 19/00721
Long-term prediction	H04N 19/00727

Special rules of classification within this group

The assignment of a class under H04N 19/00254 is obligatory.

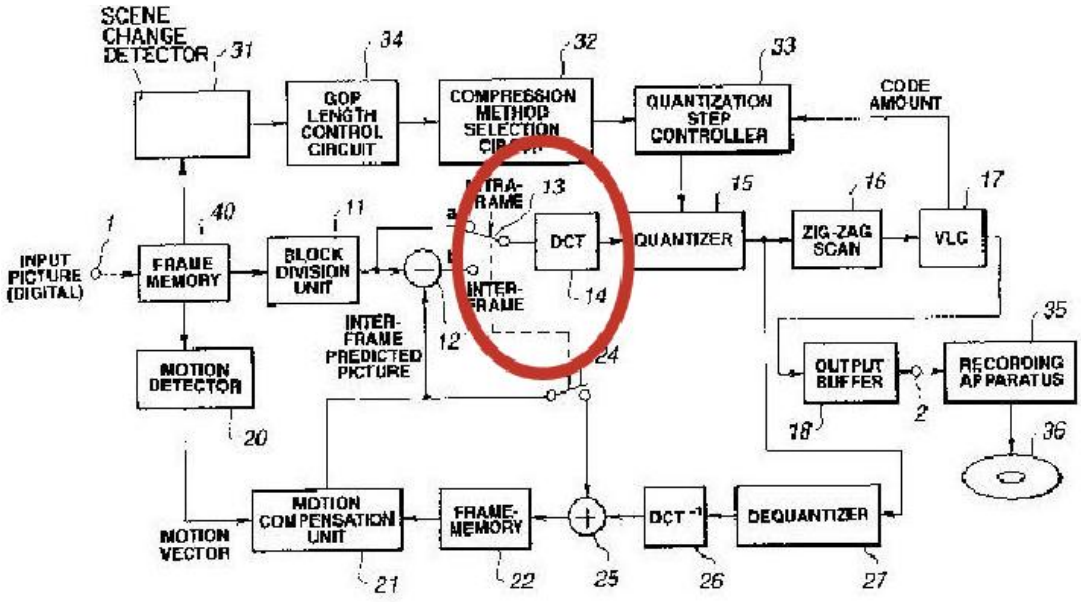
H04N 19/0003

[N: between spatial and temporal predictive coding, e.g. picture refresh or intra-inter mode decision]

Definition statement

This subclass/group covers:

The selection between spatial and temporal predictive coding, e.g. picture refresh by insertion of an intra-coded frame, as e.g. periodically or at scene change, or decision among intra-mode and inter-mode as in the figure.



Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Intra-frame, I-frame	Frame coded with spatial prediction
Inter-frame, P-frame	Frame coded with temporal prediction in one temporal direction
Bidirectional-frame, B-frame	Frame coded with temporal prediction in both temporal directions
Anchor frame	A frame usable for prediction of other frames, i.e. an intra-frame or an inter-frame

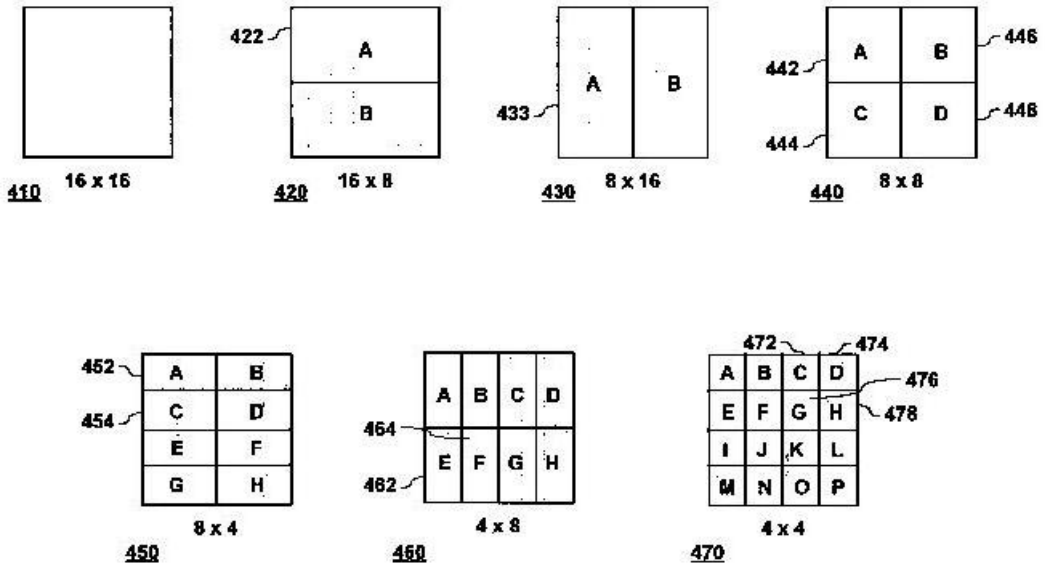
H04N 19/00036

[N: among a plurality of temporal predictive coding modes]

Definition statement

This subclass/group covers:

The selection among a plurality of temporal predictive coding modes, e.g. a plurality of inter-prediction modes as in the standard H.263 or in the standard H.264, as shown below.



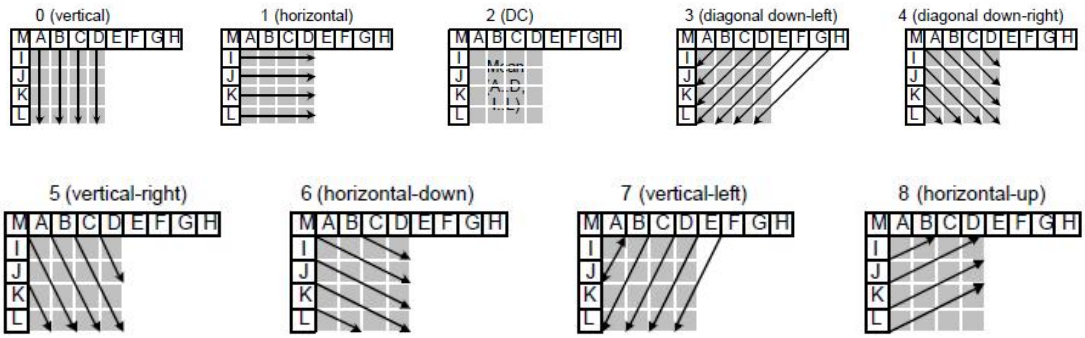
H04N 19/00042

[N: among a plurality of spatial predictive coding modes]

Definition statement

This subclass/group covers:

The selection among a plurality of spatial predictive coding modes, e.g. a plurality of intra-prediction modes as the directional block intra-prediction modes in the standard H.264 shown below.



H04N 19/00048

[N: suitable for a given display mode, e.g. for interlaced or progressive display mode]

Definition statement

This subclass/group covers:

The selection of a given display mode, e.g. interlaced or progressive as in the figure (as in MBAFF of H.264), and of the associated coding or prediction mode.

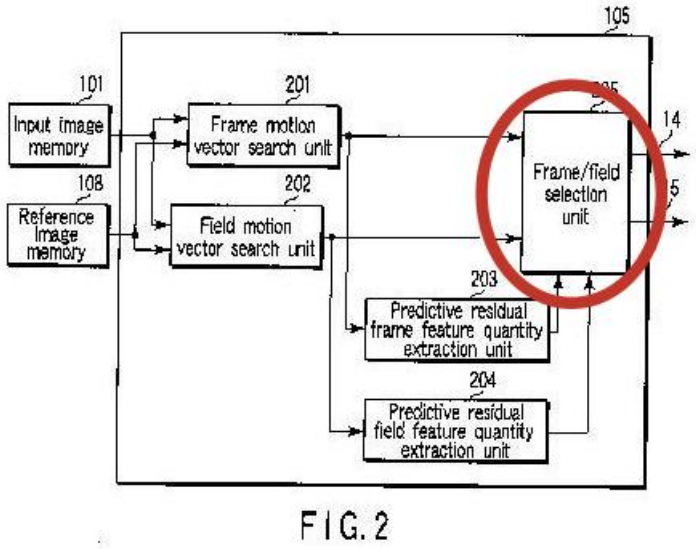


FIG. 2

Informative references

Attention is drawn to the following places, which may be of interest for search:

Conversion at the pixel level of a picture from interlaced to progressive display mode and viceversa	**H04N7/01D**

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

MBAFF	Macroblock-adaptive frame-field coding

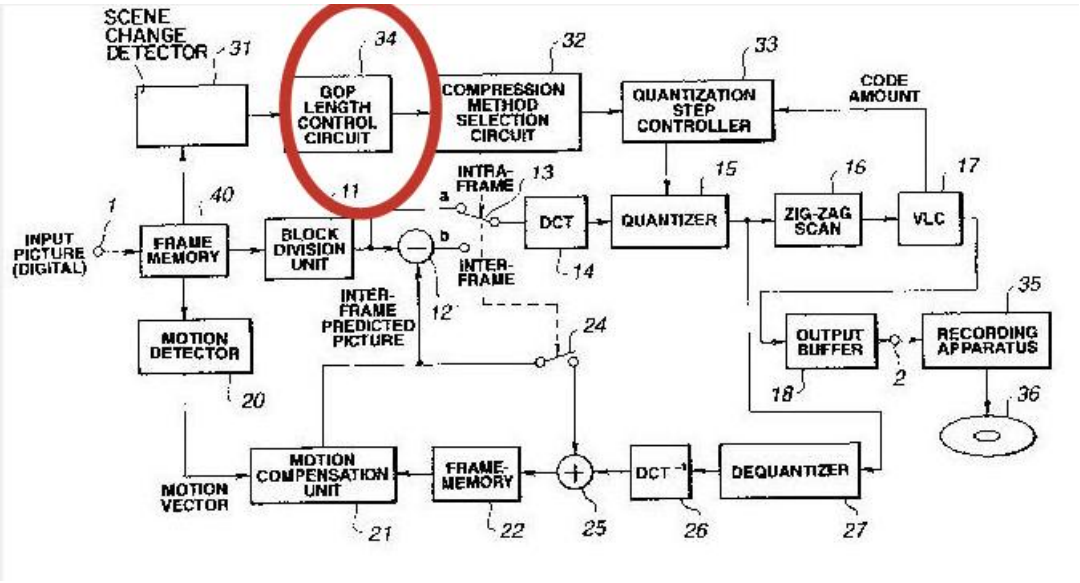
H04N 19/00054

[N: Structure of a group-of-pictures [GOP], e.g. number of B-frames between two anchor frames (H04N 19/0003 takes precedence)]

Definition statement

This subclass/group covers:

The selection of the structure of a group-of-pictures [GOP], e.g. of the number of P-frames, B-frames between two anchor frames, e.g. as in the figure below.



References relevant to classification in this group

This subclass/group does not cover:

The selection between spatial and temporal predictive coding	H04N 19/0003

Informative references

Attention is drawn to the following places, which may be of interest for search:

Bidirectional image interpolation, B-frames	H04N 19/00721

Special rules of classification within this group

The present group should be assigned when explicit reference to adapting the length or the composition of a GOP is made, e.g. by changing the number of B-frames between anchor frames or by changing the number of P-frames between I-frames.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this group, the following terms are used with the meaning indicated:

Group-of-pictures	A group of successive pictures forming a logic unit within a coded video sequence in H.26x and MPEG standards.
Open GOP	A GOP which uses referenced pictures from the previous GOP at the current GOP boundary.
Closed GOP	A GOP that uses no referenced pictures from the previous GOP at the current GOP boundary (e.g. the classic GOP starting with an I frame)

Synonyms and Keywords

In patent documents the following abbreviations are often used:

GOF	Group of frames.
GOP	Group of Pictures

H04N 19/0006

[N: Code volume assigned before coding to a coding unit]

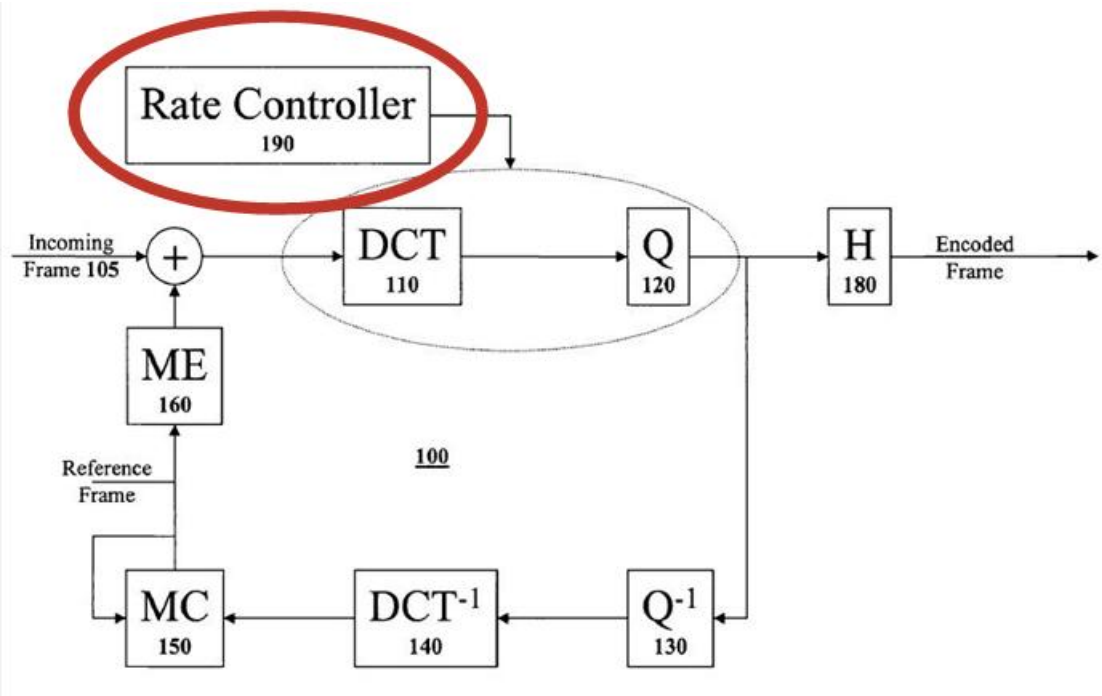
Definition statement

This subclass/group covers:

The selection of the target rate or code volume assigned to a coding unit before coding the unit itself, e.g. to a picture or a group-of-pictures, as done within the rate controller in the figure below (US7940843), or selection of frame rate.

Special rules of classification within this group

When the assignment of data rate or code amount to a coding unit before coding is determined as a function of the data rate or code amount at the encoder output, an entry from the H04N 19/00169 subgroups should be attributed.



H04N 19/00066

[N: Filter, e.g. for pre- or post-processing (sub-band filter banks H04N 19/00824)]

Definition statement

This subclass/group covers:

Subject matter wherein the filtering is required to be part of an adaptive coding process, e.g. quantization controlling the filtering process, adaptive switching function after filtering process, optional filtering characteristics, adaptive selection of a filter type or of filter parameters, like strength and taps, as within the filter indicated in the figure below in function of a threshold determination.

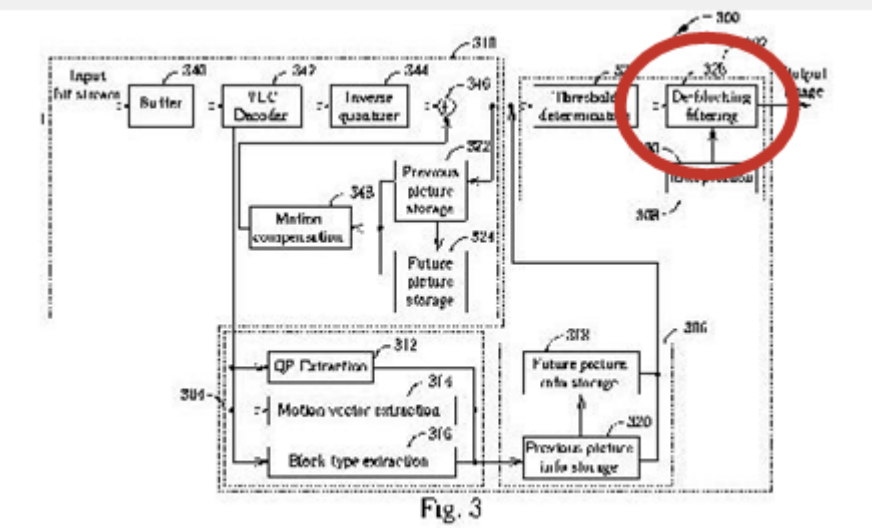


Fig. 3

Relationship between large subject matter areas

Filters in general are covered in H03H.

Image filtering for image enhancement or restoration is covered in G06T 5/00, G06T 5/20.

References relevant to classification in this group

This subclass/group does not cover:

Filter definition or implementation for sub-band based transform	H04N 19/00824

Informative references

Attention is drawn to the following places, which may be of interest for search:

Details of filtering operation specifically adapted to video compression and not necessarily of adaptive nature	H04N 19/0089
Pre-processing or post-processing specifically adapted to video compression	H04N 19/00903

H04N 19/00072

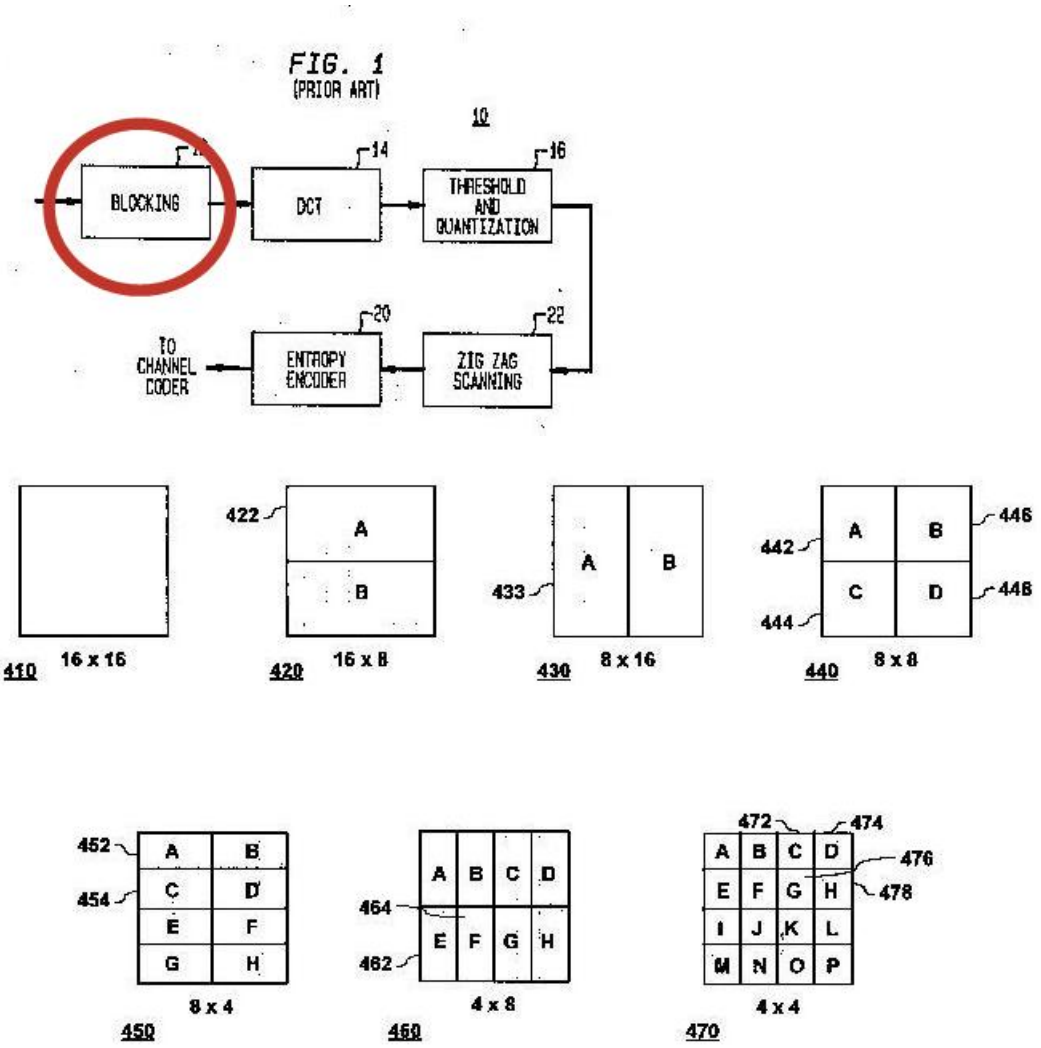
[N: Selection of the subdivision of a picture into coding blocks, e.g. having a rectangular or non-rectangular shape]

Definition statement

This subclass/group covers:

The selection of the subdivision of a picture into coding blocks, i.e. the determination of the grid of blocks covering a picture.

The selection may involve the shape, e.g. rectangular or non-rectangular, or the size of the blocks, e.g. in the standard H.264 with selection among 4x4, 4x8, 8x4, 8x8 pixel block sizes as shown in the figures below.



Informative references

Attention is drawn to the following places, which may be of interest for search:

Segmentation or edge detection for image analysis	G06T 7/0079

Special rules of classification within this group

Adaptive segmentation aspects during video compression should be classified here.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this group, the following term is used with the meaning indicated:

Macroblock	A MPEG coding unit including 16 x 16 pixels subdivided into four 8 x 8 blocks.

Synonyms and Keywords

In patent documents the following words "block", "sub-block" and "tile" are often used as synonyms.

In patent documents the word "tile" is often used in the context of the standard JPEG 2000 and of transform coding of static images.

H04N 19/00078

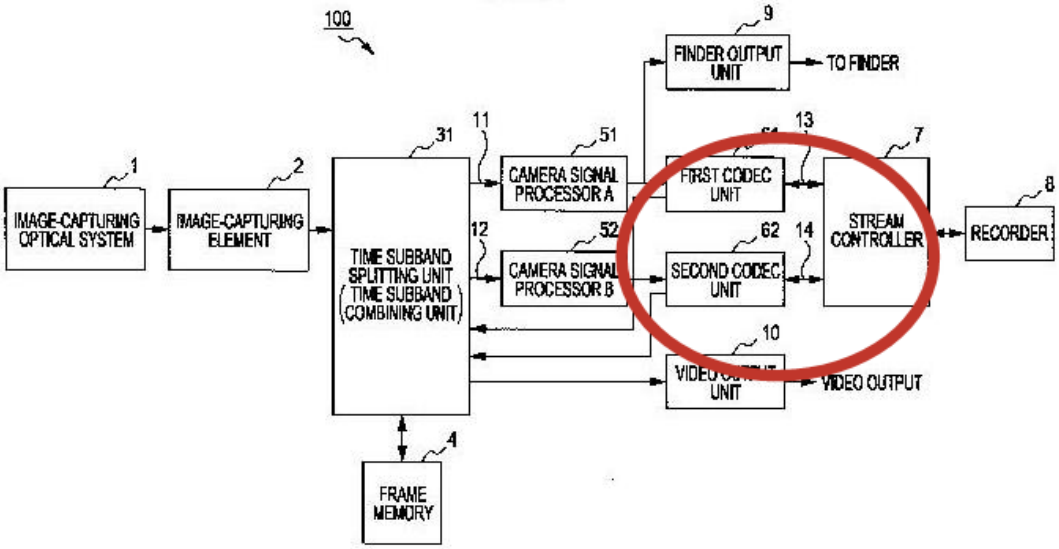
[N: Selection from a plurality of transforms or standards, e.g. selection between discrete cosine transform [DCT] and subband or selection between H.263 and H.264]

Definition statement

This subclass/group covers:

The selection from a plurality of alternative compression algorithms within a video compressor, e.g. selection among discrete cosine transform [DCT] and subband transform, or the selection from a plurality of video compression standards, e.g. selection among H.263 and H.264, selection among MPEG-2 and MPEG-4.

FIG. 1



Informative references

Attention is drawn to the following places, which may be of interest for search:

Video compression based on transform coding	H04N 19/00775
Special coding techniques and algorithms	H04N 19/00945

Special rules of classification within this group

The identification of each alternative compression algorithms is made by assigning the relevant subgroups of H04N 19/00775 or H04N 19/00945.

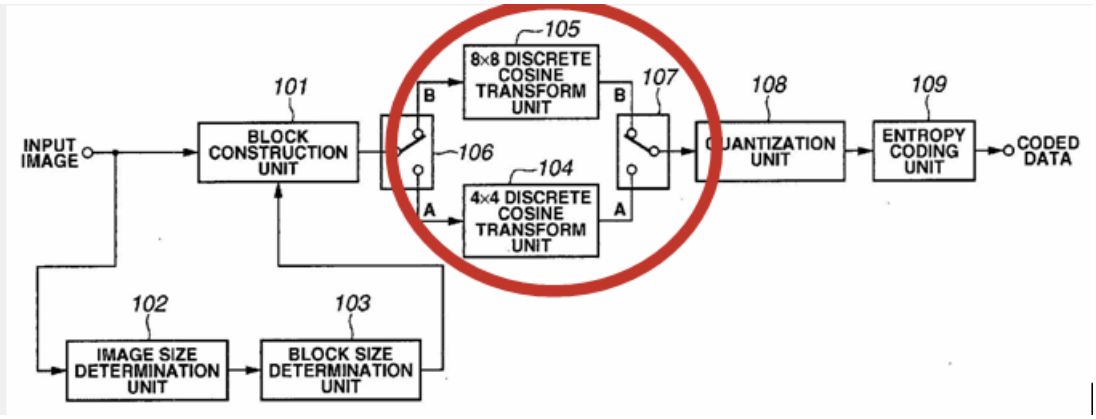
H04N 19/00084

[N: Selection of transform size, e.g. 8x8 or 2x4x8 DCT, or subband transforms of varying structure or type]

Definition statement

This subclass/group covers:

The selection of transform size within the same predetermined transform algorithm, e.g. 4x4 or 8x8 DCT as in the figure below, or 8x8 or 2x4x8 DCT for frame-based and for field-based block compression, respectively, or sub-band transforms of varying hierarchical structure or type.



H04N 19/0009

[N: Quantisation]

Definition statement

This subclass/group covers:

Subject matter wherein specific details of a controlled quantiser is provided,

e.g. frame type or input video characteristics controlling the quantiser, adaptive quantisation based on output or transmission buffer fullness, choice between fine or coarse quantisation.

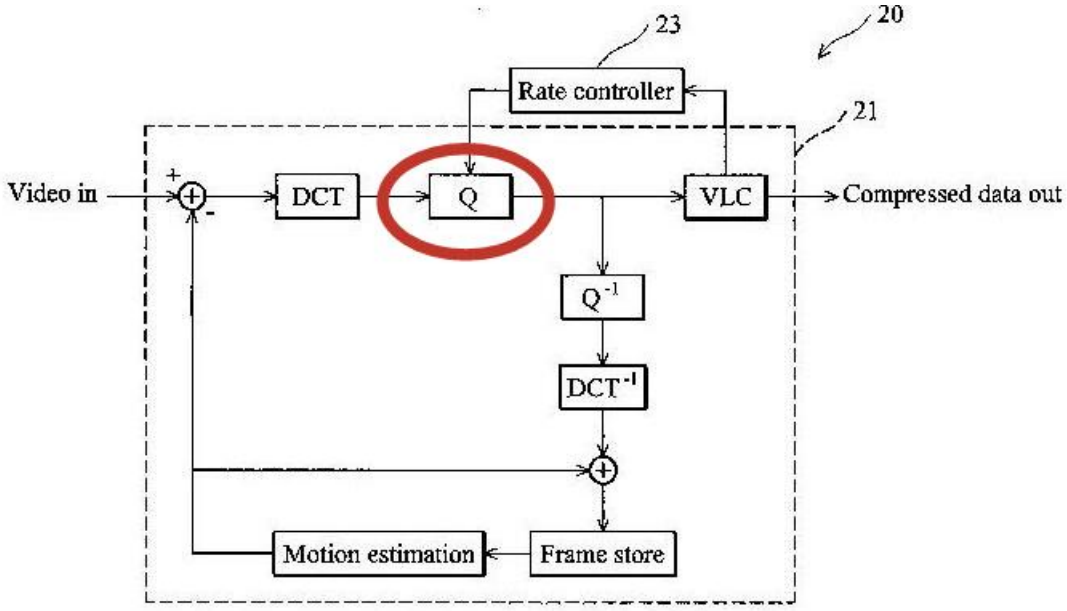


FIG. 2

Special rules of classification within this group

Quantisation is omnipresent in video compression. The mere mentioning of quantisation (e.g., figures, claims) should not be classified here.

Therefore, this subgroup should be assigned together with relevant subgroups of H04N 19/00133, H04N 19/00254, H04N 19/00345 when special adaptivity details are disclosed, although without special mathematical details about the quantisation algorithm itself.

Mathematical details are classified in H04N 19/00096.

H04N 19/00096

[N: characterized by details about quantisation, normalisation or weighting functions, e.g. normalisation parameters or matrices, variable uniform quantisers or weighting matrices]

Definition statement

This subclass/group covers:

Special algorithms used for quantisation in video compression, e.g. the choice of normalisation parameters or matrices, details of variable uniform quantisers or the calculation of quantisation weighting matrices.

Special rules of classification within this group

This group should be assigned particularly together with relevant subgroups of H04N 19/00133, H04N 19/00254, H04N 19/00345 when special adaptivity details are disclosed together with the specification of technical details for the quantisation algorithm.

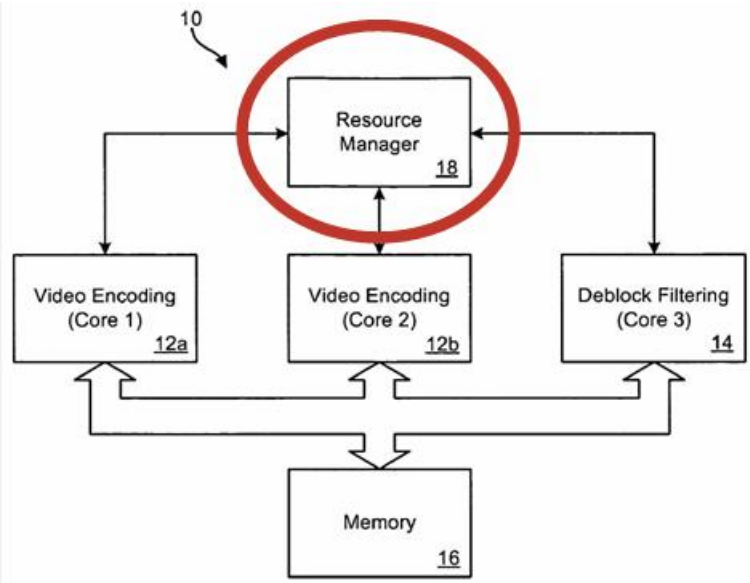
H04N 19/00103

[N: Prioritisation of hardware or computational resources]

Definition statement

This subclass/group covers:

The control of resource allocation or assignment (e.g. CPU time, memory, allocation of digital processing units, workload distribution among processors), e.g. skipping of encoding or decoding steps or switching off computing or hardware units, like e.g. motion estimation/compensation or transform units.



Informative references

Attention is drawn to the following places, which may be of interest for search:

Filtering control	H04N 19/00066
Sampling, masking or truncation of coding units	H04N 19/00127
Availability of hardware or computational resources	H04N 19/00206
Implementation details or hardware specific for video compression	H04N 19/00478

Special rules of classification within this group

This group has a complementary scope with respect to the corresponding subgroup H04N 19/00206, where the available assigned resources control the encoding operation.

H04N 19/00109

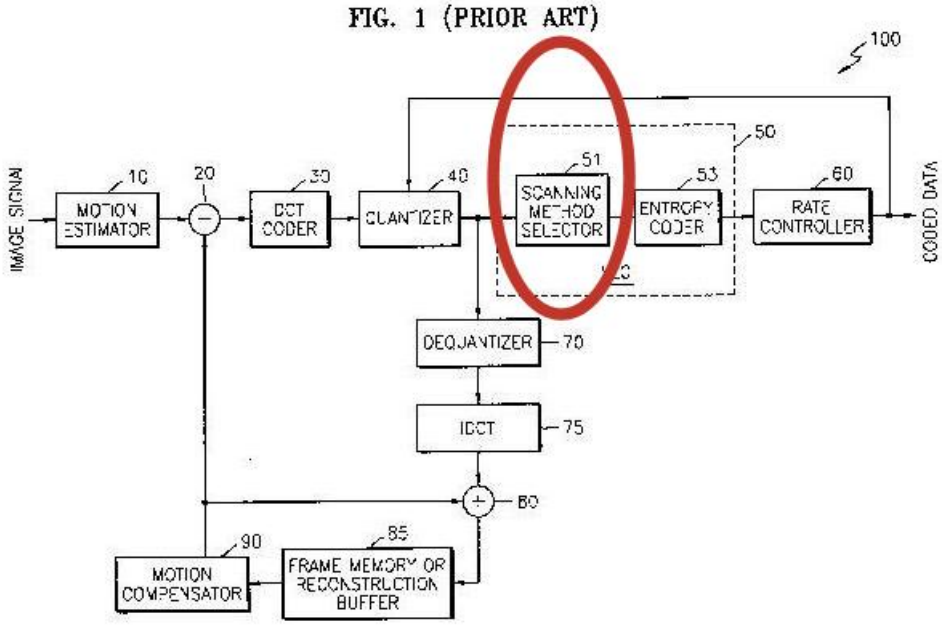
[N: Scanning of coding units, e.g. zig-zag scan of transform coefficients]

Definition statement

This subclass/group covers:

The adaptation of the scanning of coding units, e.g. the choice of a zig-zag scan of transform coefficients in a transform compressor, as in the figure, or the use of flexible macroblock ordering [FMO].

FIG. 1 (PRIOR ART)



Informative references

Attention is drawn to the following places, which may be of interest for search:

Definition of the coding unit	H04N 19/00254
Video coding involving rearrangement of data among different coding units	H04N 19/00927
Techniques for FMO	H04N 19/00115

Special rules of classification within this group

This group has to be assigned necessarily in conjunction with at least one subgroup of H04N 19/00254, necessary to define the coding units that are scanned.

H04N 19/00121

[N: Adaptive entropy coding, e.g. adaptive variable length coding, Huffman or arithmetic coding]

Definition statement

This subclass/group covers:

Subject matter wherein the entropy coding is adapted, e.g. frame type determining the coding table, CABAC, CAVLC, choosing among different VLC methods for coding as in the figure.

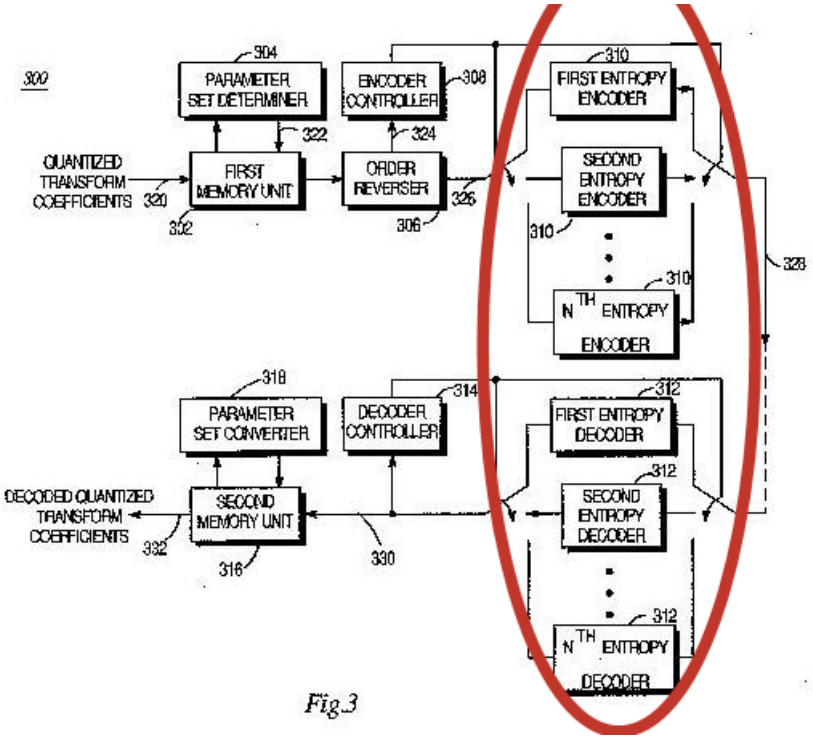


Fig.3

Informative references

Attention is drawn to the following places, which may be of interest for search:

Conversion to or from variable length codes in general	H03M 7/40
Conversion to or from run-length codes in general	H03M 7/46

Entropy coding for video compression	H04N 19/00951
Run-length coding for video compression	H04N 19/00957

Special rules of classification within this group

The relevant groups of H04N 19/00945 have also to be assigned, if the entropy coding per se is non-trivial.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

VLC	Variable Length Coding
CABAC	Context-Adaptive Binary Arithmetic Coding
CAVLC	Context-Adaptive Variable Length Coding

H04N 19/00127

[N: Sampling, masking or truncation of coding units, e.g. adaptive resampling, frame skipping, frame interpolation or high frequency transform coefficient masking]

Definition statement

This subclass/group covers:

Adaptive sampling, masking or truncation of coding units, e.g. adaptive resampling, frame skipping, frame interpolation or high frequency transform coefficient masking, i.e. suppression or setting to zero, macroblock skipping, as in the figure.

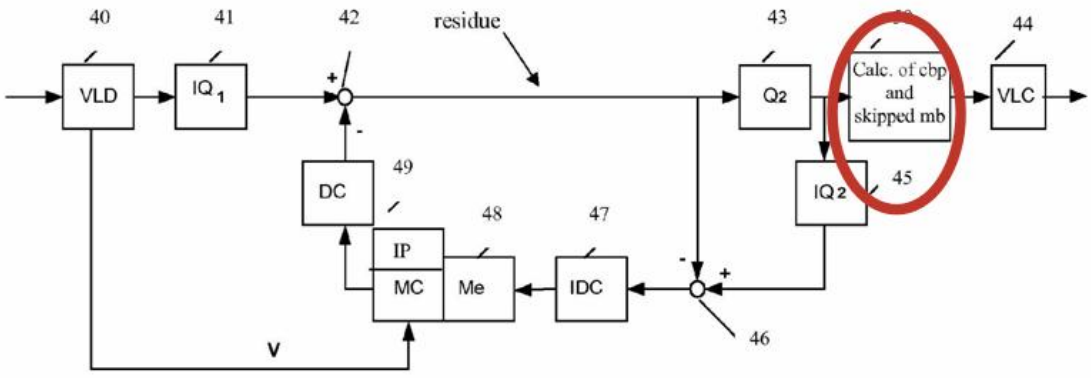


FIG. 5

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adaptive prioritisation of hardware or computational resources	H04N 19/00103
Definition of the coding unit	H04N 19/00254
Temporal sampling or interpolation for video coding	H04N 19/00751
Spatial sampling or interpolation for video coding	H04N 19/00757

Special rules of classification within this group

This group has to be assigned necessarily in conjunction with at least one subgroup of H04N 19/00254, necessary to define the coding units that are skipped or truncated.

H04N 19/00133

[N: characterised by an element, parameter or criterion affecting, i.e. controlling, the adaptive coding]

Definition statement

This subclass/group covers:

The definition of an element, a parameter or criteria, which exercises the control of an adapted element or selection as classified in H04N 19/00012 in the adaptive coding, wherein element is to be understood as a functional block or process in the digital video compressor or decompressor.

H04N 19/00139

[N: Incoming video signal characteristics or properties]

Definition statement

This subclass/group covers:

The characteristics or properties of the images forming the incoming video not covered in the subgroups, e.g. the display size.

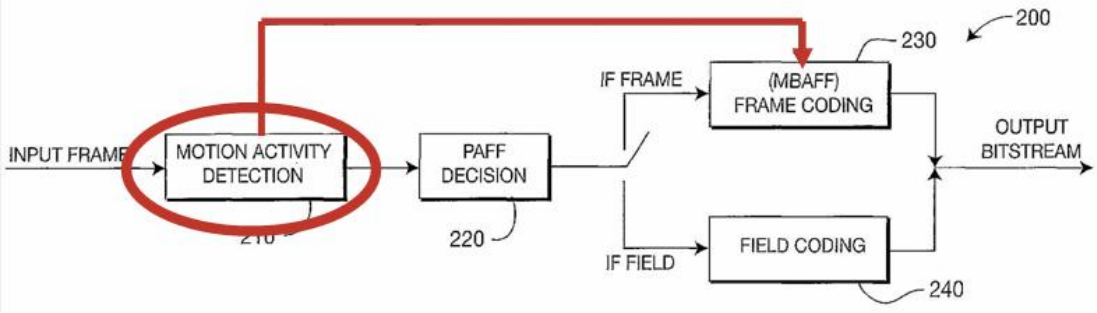
H04N 19/00145

[N: Measure of motion inside a coding unit, e.g. average field, frame or block difference]

Definition statement

This subclass/group covers:

Measure of motion inside a coding unit, e.g. measure of temporal prediction errors, such as average difference calculated on a field, on a frame or on a block in two different time instants.



Informative references

Attention is drawn to the following places, which may be of interest for search:

Analysis of motion in general	G06T 7/20
Motion estimation or compensation for video compression	H04N 19/00587

H04N 19/00151

[N: using motion vectors]

Definition statement

This subclass/group covers:

The measure of motion performed by explicitly using motion vectors (e.g magnitude, direction, variance, reliability measures).

Informative references

Attention is drawn to the following places, which may be of interest for search:

Analysis of motion in general	G06T 7/20

Motion estimation or compensation for video compression	H04N 19/00587

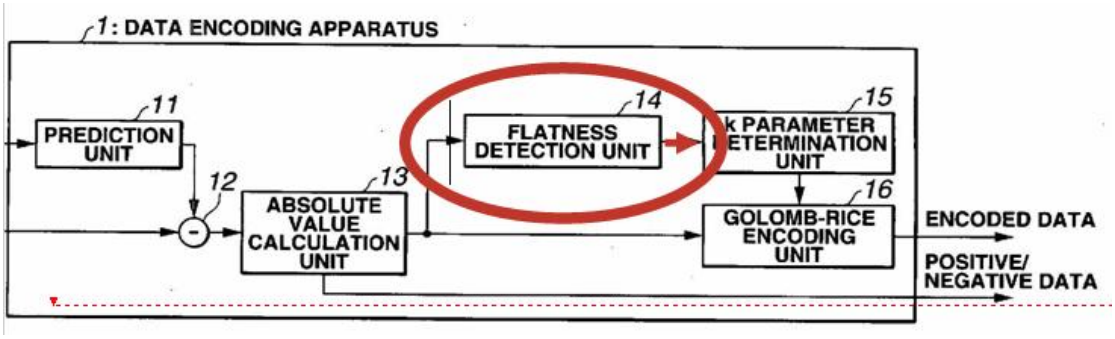
H04N 19/00157

[N: Measure of coding unit complexity, e.g. activity measure or edge presence estimation (H04N 19/00169 takes precedence)]

Definition statement

This subclass/group covers:

The measure of coding unit complexity, e.g. by means of an activity measure, as in the figure below by means e.g. of flatness detection or energy of transform coefficients, by means of the detection of edge presence or by means of a measure of spatial prediction error.



References relevant to classification in this group

This subclass/group does not cover:

Edge detection in general	G06T 7/0085
Measure of complexity defined by data rate or code amount at the encoder output	H04N 19/00169

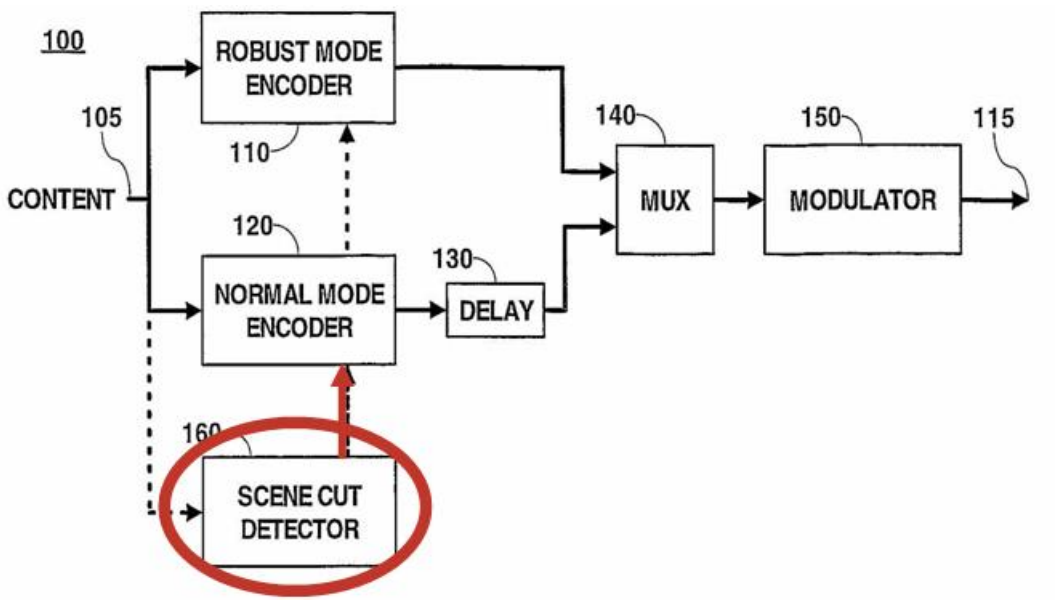
H04N 19/00163

[N: Detection of scene cut or change]

Definition statement

This subclass/group covers:

The adaptive control of the video compression in response to detected scene cut or change.



Informative references

Attention is drawn to the following places, which may be of interest for search:

Scene change detection in television systems	H04N 5/147
Methods for scene cut or change detection in conjunction with video coding or compression	H04N 19/00921

H04N 19/00169

[N: Data rate or code amount at the encoder output]

Definition statement

This subclass/group covers:

The adaptive control of video compression by using information about the data rate or code amount at the encoder output.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adaptation of the assignment of code volume to a coding unit before coding	H04N 19/0006

H04N 19/00175

[N: related to rate-distortion (rate-distortion as a criterion for

motion estimation H04N 19/00672)]

Definition statement

This subclass/group covers:

The adaptation of encoding as a function of data rate or code amount determined according to rate-distortion criteria, e.g. as a function of a cost function.

References relevant to classification in this group

This subclass/group does not cover:

Rate-distortion as a criterion for motion estimation	H04N 19/00672

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adaption based on objective or estimated subjective visual quality after decoding	H04N 19/002
Adaption obtained by applying rate-distortion criteria using Lagrange multiplier based optimisation	**H04N19/00A4A**

Special rules of classification within this group

This group is often relevant in combination with the subgroup H04N 19/00345.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this subclass/group, the following terms (or expressions) are used with the

meaning indicated:

Cost function	A function of target parameters, as output rate and quality measurement after decoding (e.g. distortion).

H04N 19/00181

[N: with estimation of the code amount by means of a model, e.g. mathematical model or statistical model]

Definition statement

This subclass/group covers:

The estimation of the code amount by means of a model, e.g. a mathematical model or a statistical model, as done in the MPEG-2 Test Model 5 (TM5), cf.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adaption obtained by applying methods for calculating encoding parameters	**H04N19/00A4C**

H04N 19/00187

[N: with measurement and check of actual compressed data size at the memory before deciding storage at the transmission buffer]

Definition statement

This subclass/group covers:

The estimation of the code amount by off-line encoding, i.e. encoding without storing at the transmission buffer, e.g. by means of a separate encoder as in the figure below, and counting of the actual data size of the compressed elementary stream.

The estimation covered by the present subgroup is opposed to the modelling covered by H04N 19/00181.

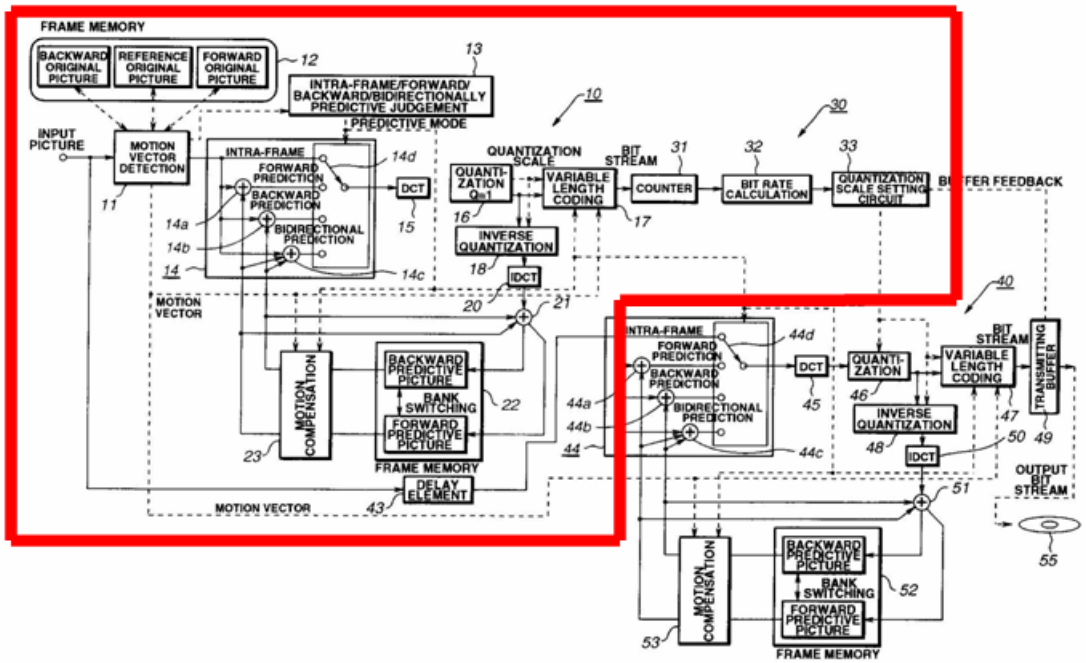


FIG.1

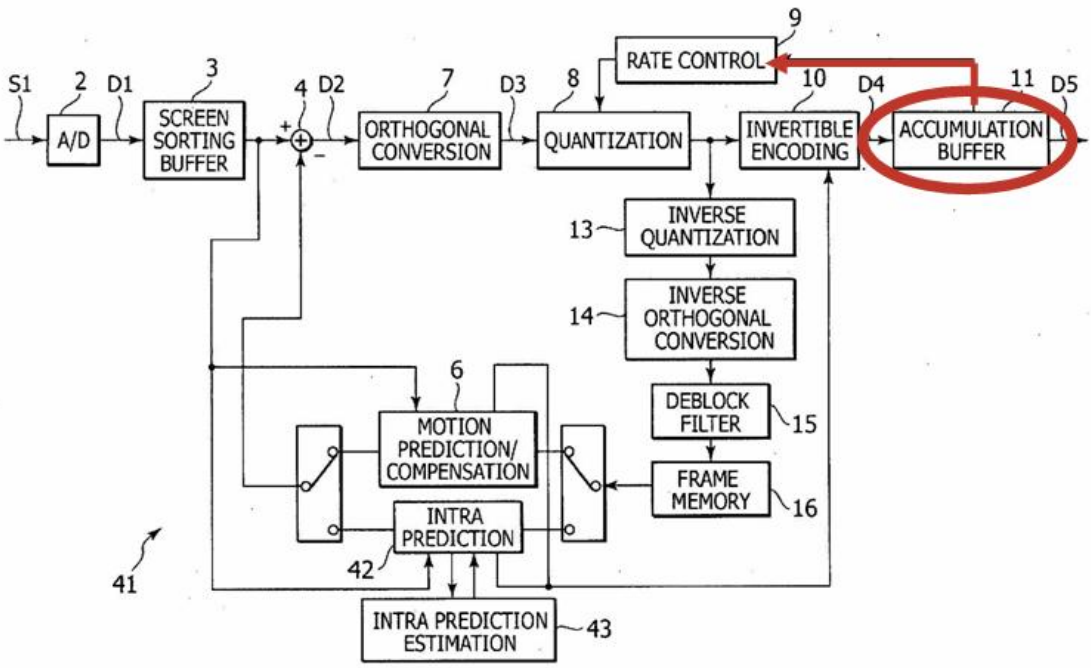
H04N 19/00193

[N: with measurement of buffer fullness]

Definition statement

This subclass/group covers:

The control of the video coding by using the measurement of fullness in the transmission buffer, where the buffer may be implicit, as e.g. in the cases of a storage medium, a memory, a physical channel having a certain bit capacity.



Informative references

Attention is drawn to the following places, which may be of interest for search:

Management of transmitter-side video buffer	H04N 21/23406

H04N 19/002

[N: Objective or estimated subjective visual quality after decoding, e.g. measurement of distortion (use of rate-distortion criteria H04N 19/00175)]

Definition statement

This subclass/group covers:

The control of video coding by means of quality after decoding, as measured, e.g. by means of distortion measurement, or as estimated by means of subjective tests.

Relationship between large subject matter areas

Quality measurement of images in general is covered in G06T 7/00.

Quality measurement of video in the context of diagnosis, testing or measuring for television systems is covered by H04N 17/00.

References relevant to classification in this group

This subclass/group does not cover:

Examples of places where the subject matter of this subgroup is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Use of rate-distortion criteria	H04N 19/00175

Informative references

Attention is drawn to the following places, which may be of interest for search:

Inspection of images, e.g. flaw detection	G06T 7/0002

Special rules of classification within this group

This group should be assigned, when quality is not particularly linked to output bit-rate.

H04N 19/00206

[N: Availability of hardware or computational resources, e.g. encoding based on power-saving criteria]

Definition statement

This subclass/group covers:

The control of video coding in dependence of the availability of hardware or computational resources, e.g. encoding based on power-saving criteria, time constrained encoding.

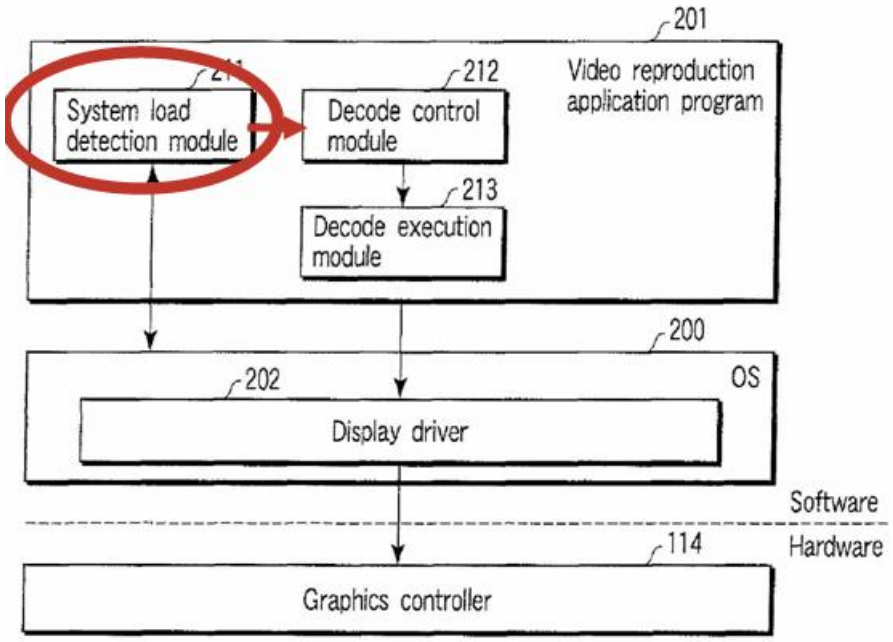


FIG. 3

Informative references

Attention is drawn to the following places, which may be of interest for search:

Allocation or assignment of hardware or computational resources.	H04N 19/00103
Implementation details or hardware specific for video compression	H04N 19/00478

Special rules of classification within this group

This group has a complementary scope with respect to the corresponding subgroup H04N 19/00103, covering the allocation or assignment of hardware or computational resources.

H04N 19/00212

[N: Assigned coding mode, i.e. the coding mode is predefined or preselected to be further used for selection of another element or parameter]

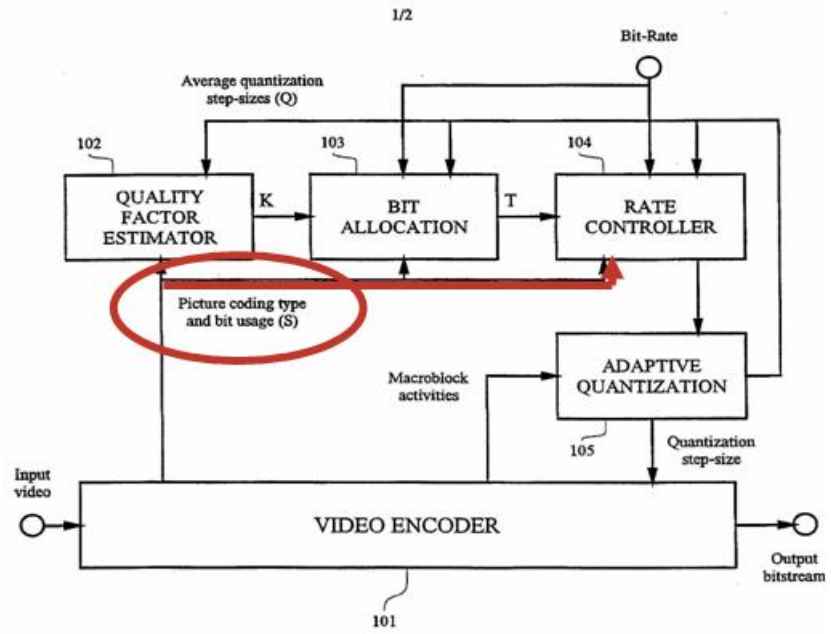
Definition statement

This subclass/group covers:

The control of video coding as a function of the coding mode assigned to the

unit to be coded, i.e. the coding mode of the unit to be coded is predefined or preselected.

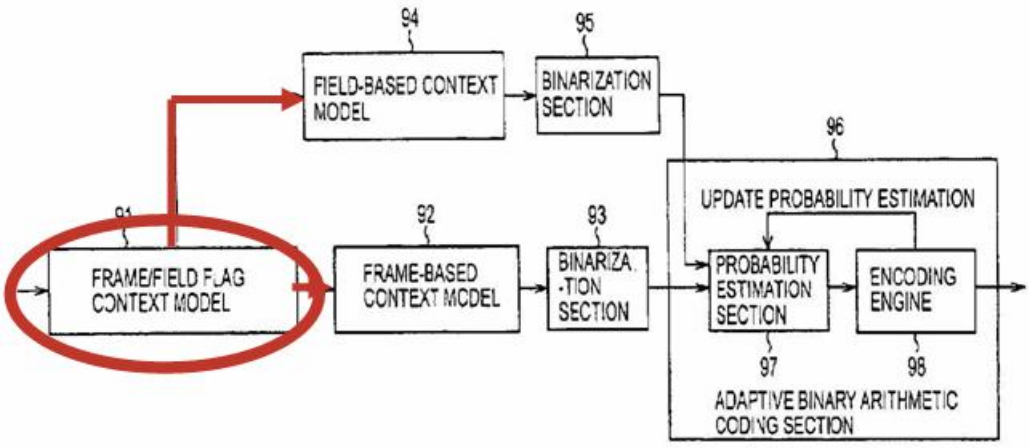
The group H04N 19/00218 covers the case that the coding mode is the prediction type used for the unit to be coded, e.g. intra, inter or bidirectional, as in the figure below.



The group H04N 19/00224 covers the case that the assigned coding mode is suitable for a given display mode, e.g. for interlaced or progressive display mode, as in the figure below.

The head group H04N 19/00212 covers all other cases.

FIG. 27



Special rules of classification within this group

This group is not the same as the corresponding group H04N 19/00018, covering details of adapting the selection of the coding mode.

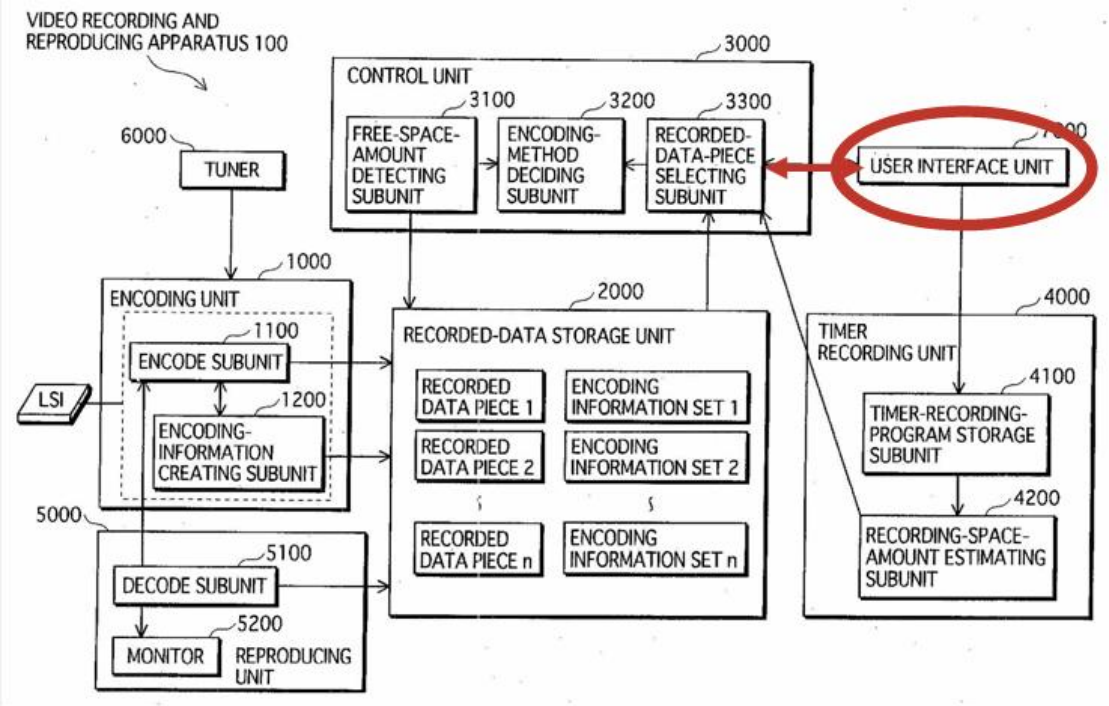
H04N 19/0023

[N: User input]

Definition statement

This subclass/group covers:

The control of the video encoding by means of the input from a user, e.g. from a user interface as in the figure.



H04N 19/00236

[N: Feedback from the receiver or from the transmission channel]

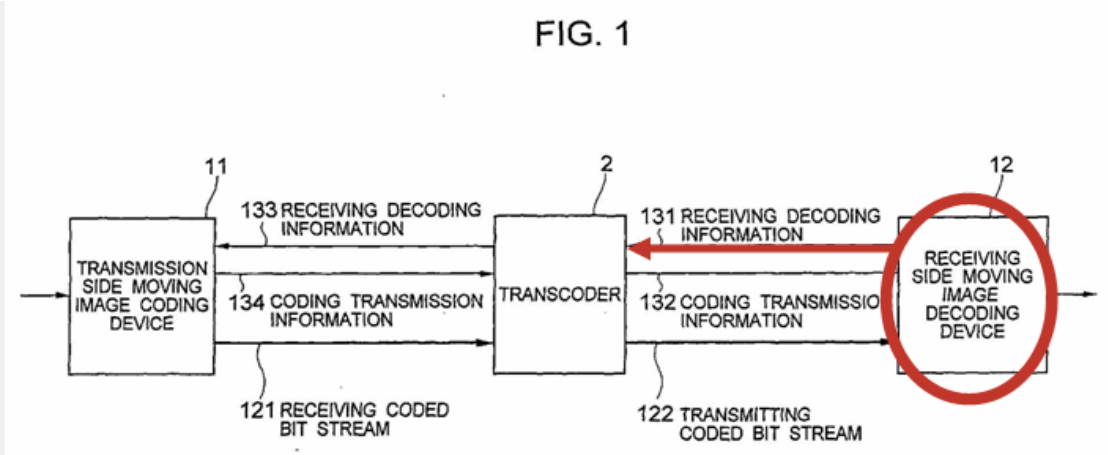
Definition statement

This subclass/group covers:

The control of encoding the elementary video stream as a function of the feedback from the client/receiver or from the transmission channel, as e.g. in the figure below.

The subgroup H04N 19/00242 covers in particular the case that the feedback

consists of a measure of transmission errors, e.g. by means of a bit- or packet-error-rate measure, and the subgroup H04N 19/00236 covers all remaining cases.



Relationship between large subject matter areas

The control of encoding as a function of the feedback from the receiver or from the transmission channel in a general telecommunication context is covered in H04L and H04W.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Control signalling related to video distribution between receiver, transmitter and network components	H04N 21/63
Transmission of management data between client and server	H04N 21/65

Special rules of classification within this group

This group is often assigned in combination with the group H04N 19/00545.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

BER	Bit Error Rate
PER	Packet Error Rate

H04N 19/00248

[N: Position within a video image, e.g. region of interest [ROI]]

Definition statement

This subclass/group covers:

The control of the video encoding as a function of a coding unit's position within a video image, e.g. the adoption of coding parameters adapted to a region of interest, different coding of foreground and of background, different coding at the image centre and at the image borders.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Image segementation, e.g. for determination of region of interest	G06T 7/0079
Image region as coding unit	H04N 19/0026

Special rules of classification within this group

Adaptive video coding depends generally indirectly on the position within an image, e.g. coding parameters may be varied across coding units, e.g. blocks.

The present subgroup covers the case when the spatial position within the image as criterion is explicitly and directly defined, as in the examples indicated above.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

ROI	Region Of Interest

H04N 19/00254

[N: characterised by the structural or semantic portion of the video signal being the object or the subject of the adaptive control during the coding, i.e. the coding unit (H04N 19/00012, H04N 19/00133 take precedence)]

Definition statement

This subclass/group covers:

The definition of the portion of the video signal that undergoes the adaptive control, defined as the coding unit.

Further details of subgroups

The subgroups of H04N 19/00254, cf. the list below, define explicitly which coding units are meant and H04N 19/00254 is residual with respect to its subgroups.

H04N 19/0026	the unit being an image region, e.g. object
H04N 19/00266	where the region is a picture, frame or field
H04N 19/00272	where the region is a slice, e.g. line of blocks or group of blocks
H04N 19/00278	where the region is a block or a macroblock
H04N 19/00284	the unit being a group-of-pictures [GOP]
H04N 19/0029	the unit being a scene or shot
H04N 19/00296	the unit being a set of transform coefficients
H04N 19/00303	the unit being a pixel, e.g. luminance value
H04N 19/00309	the unit being bits, e.g. of the compressed video stream
H04N 19/00315	the unit being a colour or chrominance component
H04N 19/00321	the unit being a scalable video layer
H04N 19/00327	the unit being a video data packet, e.g. a network abstraction layer [NAL] unit
H04N 19/00333	the unit relating to sub-band structure, e.g. hierarchical level, directional tree, e.g. low-high [LH], high-low [HL], high-high [HH]
H04N 19/00339	the unit being a variable length codeword

References relevant to classification in this group

This subclass/group does not cover:

Element, parameter or selection affected by the adaptive coding	H04N 19/00012
Element, parameter or criterion affecting the adaptive coding	H04N 19/00133

Informative references

Attention is drawn to the following places, which may be of interest for search:

Image segementation, e.g. for determination of region of interest	G06T 7/0079
Methods for scene cut or change detection in conjunction with video coding or compression	H04N 19/00921
Hierarchical and scalability techniques	H04N 19/00424
Assembling of a multiplex stream, e.g. transport stream; assembling of a packetised elementary stream	H04N 21/236
Multiplex stream processing at transmitter side	H04N 21/2389
Multiplex stream processing at receiver side	H04N 21/4385
Sub-band based transform coding	H04N 19/00818
Adaptive entropy coding	H04N 19/00121
Details of entropy coding for video coding	H04N 19/00951

Special rules of classification within this group

The present group and its subgroups must only be assigned, if a coding unit is explicitly disclosed with reference to the definition of adaptive coding method or apparatus.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this subclass/group, the following terms (or expressions) are used with the

meaning indicated:

(Video) Object	MPEG-4 object, i.e. a region of the image with arbitrary shape
Slice	A set of blocks within an image, e.g. a line of blocks.
Block	A rectangular matrix of pixels.
Macroblock	MPEG coding unit formed by four blocks arranged as a 2 x 2 matrix.
Group of picture	MPEG coding unit formed by a set of consecutive pictures.
(Scalable) Layer	Coding unit of a scalable encoded video elementary stream

Synonyms and Keywords

In patent documents the following abbreviations are often used:

GOB	Group of Blocks
GOP	Group of Pictures
GOF	Group of Frames
FMO	H.264 Flexible Macroblock Ordering

In patent documents the following expressions "slice" and "GOB" are often used as synonyms.

In patent documents the following words,"block" and "tile" are often used as synonyms.

H04N 19/00345

[N: characterised by a formulation applied to the adaptation, e.g. adaptation method or type]

Definition statement

This subclass/group covers:

Special mathematical or algorithmic formulations for the methods or tools used for video coding adaptation.

Special rules of classification within this group

This group is residual with respect to its subgroups.

H04N 19/00351

[N: using Lagrange multiplier based optimisation]

Definition statement

This subclass/group covers:

The formulation in terms of optimisation based on Lagrange multiplier techniques, as e.g. in the cost function defined as C = R + # D, where R is the output rate and D is the distortion after decoding.

H04N 19/00357

[N: the formulation being iterative or recursive]

Definition statement

This subclass/group covers:

Iterative algorithm and techniques applied to the adaptation of video coding.

The special case of two pass or two-step algorithms are covered by H04N 19/00363.

References relevant to classification in this group

This subclass/group does not cover:

Cascading of steps or functional blocks for performing a single operation, e.g. filtering	H04N 19/00478

H04N 19/00369

[N: adapted to the computation of encoding parameters, e.g. by averaging previously computed encoding parameters (H04N 19/00684 takes precedence)]

Definition statement

This subclass/group covers:

Details of the mathematical laws or algorithms used for computation of encoding parameters (like e.g. quantisation step, coding mode), e.g. estimating a current encoding parameter by averaging previously computed encoding parameters, deriving the coding mode for the current coding unit from the coding mode of the neighbouring coding units.

Further details of subgroups

The subgroup H04N 19/00375 covers the determination of the initial value of an encoding parameter, e.g. of a quantisation step or of a target bit rate.

The subgroup H04N 19/00381 covers details of smoothing of a sequence of encoding parameters, e.g. by averaging, by choice of the maximum, minimum or median value, e.g. determining the quantisation step in the current coding block as an average of the steps in the surrounding blocks.

References relevant to classification in this group

This subclass/group does not cover:

Formulations for initializing motion vector search	H04N 19/0066
Formulations for processing of calculated motion vectors	H04N 19/00684

H04N 19/00387

[N: using video object coding]

Definition statement

This subclass/group covers:

Details of object-based video coding, as e.g. according to the standard MPEG-4.

Relationship between large subject matter areas

Details of shape coding and image coding based on geometric models (e.g. wireframe models, coding details of synthetic picture components) are covered by G06T 9/00.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Contour coding	G06T 9/20
Hierarchical and scalability techniques (cf. H04N 19/00418)	H04N 19/00424
Decomposing video signals into objects	H04N 21/234318
Generating or manipulating the scene composition of objects	H04N 21/23412
Rendering scenes according to scene graphs	H04N 21/44012

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this subclass/group, the following terms (or expressions) are used with the

meaning indicated:

(Video) Object	MPEG-4 object, i.e. a region of the image with arbitrary shape
Alpha-plane	A discrete bitmap (generally binary) defining the part of a frame constituting a given object, e.g. in terms of the position of the pixels belonging to the object or in terms of the position of the blocks covering the object.
Sprite	A unified background image derived by compositing the backgrounds of the single frames of a video sequence, e.g. having a camera motion throughout a video segment (within e.g. a scene, a shot, a GOP, a sequence). It may be static or dynamic.
Scene description coding	The coded representation of the spatiotemporal positioning of audio-visual objects as well as their behaviour in response to interaction, as e.g. in the standard MPEG-4 Part 11.
Synthetic/natural hybrid coding	Part of the MPEG-4 standard relating to coding facial animation and mesh compression.
Synthetic picture component	A picture component that is coded by geometric modelling with synthesizing at reconstruction (e.g. avatar).
Natural picture component	A picture component that is coded "as it stands" without geometric modelling.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

BIFS	BInary Format for Scenes
SNHC	Synthetic/Natural Hybrid Coding
VOL	Video Object Layer
VOP	Video Object Plane

In patent documents the following expressions/words "object", "video object" and "video object plane (VOP)" are often used as synonyms.

H04N 19/00424

[N: using hierarchical techniques, e.g. scalability (H04N 19/00818 takes precedence)]

Definition statement

This subclass/group covers:

Details of video coding, where the elementary video stream is coded so that it contains a hierarchy of different compressed representations of the same video sequence, wherein each representation may correspond e.g. to a different video resolution or video format. Layered coding is also covered here.

The hierarchy may be incremental, as e.g. in scalable video coding (like the extension of the standard H.264 called Scalable Video Coding [SVC]).

References relevant to classification in this group

This subclass/group does not cover:

Sub-band based transform coding	H04N 19/00818

Informative references

Attention is drawn to the following places, which may be of interest for search:

Decomposing video signals into layers at the transmitter side	H04N 21/234327
Controlling the complexity of the video stream at the transmitter side, e.g. by scaling the resolution or bitrate of the video stream	H04N 21/2662
Decomposing video signals into layers at the receiver side	H04N 21/440227
Controlling the complexity of the video stream at the receiver side, e.g. by scaling the resolution or bitrate of the video stream	H04N 21/4621

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this group, the following terms are used with the meaning indicated:

Temporal scalability	Scalability in terms of frame rate, meaning that a given bit stream includes different sub-streams each with a different frame rate or sub-streams that, when combined, increase the output frame rate.
Spatial scalability	Scalability in terms of spatial video sampling rate or resolution (e.g. quantisation step size, pixel bit depth), meaning that a given bit stream includes different sub-streams each with a different frame size or resolution or sub-streams that, when combined, increase the output frame size or resolution.

H04N 19/0043

[N: in the temporal domain]

Definition statement

This subclass/group covers:

Performing hierarchical or layered coding by acting on temporal resolution, e.g. temporal scalability.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Temporal sub- or re-sampling or interpolation for video coding	H04N 19/00751

H04N 19/00436

[N: in the spatial domain]

Definition statement

This subclass/group covers:

Performing hierarchical or layered coding by acting on spatial resolution, e.g. spatial scalability.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Spatial sub- or re-sampling or interpolation for video coding	H04N 19/00757

H04N 19/00454

[N: with arrangements to assign different transmission priorities to video input data or to video coded data]

Definition statement

This subclass/group covers:

The preliminary organisation of the video elementary stream with assignment of different priorities or importance to data to be further transmitted, e.g. for transmission or dropping.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Protocols for client-server architecture	H04L 29/06047
Error resilience techniques for digital video coding involving data partitioning	H04N 19/0086
Multimode transmission, e.g. transmitting content basic layer and enhancement layers over different transmission paths or with different error corrections	H04N 21/631

H04N 19/00472

[N: using video transcoding, i.e. partial or full decoding of a coded input stream and re-encoding of the decoded output stream]

Definition statement

This subclass/group covers:

Transcoding of the elementary video stream at the level of digital video coding, i.e. partial or full decoding of a coded input stream and re-encoding of the decoded output stream, e.g. cf. EP2091019 (transcoder operation 73, 76)

Informative references

Attention is drawn to the following places, which may be of interest for search:

Video standard conversion at the pixel level, e.g. for analog television	H04N 7/01
Reformatting video signals for video conference systems	H04N 7/152
Processing of video elementary streams at a server involving reformatting operations of video signals	H04N 21/2343
Processing of video elementary streams at a client device involving reformatting operations of video signals	H04N 21/4402
Communication protocols, e.g. transcoding therefor	H04L 29/06
Transcoder arrangements for base stations in mobile radio systems	H04Q 7/302
General computer file format conversion	G06F 17/30005
Distillation of HTML documents for optimising th visualization of content	G06F 17/30905

H04N 19/00478

[N: characterised by implementation details or hardware specific for video compression or decompression, e.g. dedicated software implementation, memory arrangements, parallel processing or hardware for motion estimation or compensation (H04N 19/00824 takes precedence)]

Definition statement

This subclass/group covers:

Implementation details or hardware specific for elementary video compression or decompression, e.g. dedicated software implementation, memory arrangements, parallel processing or hardware for motion estimation or compensation.

References relevant to classification in this group

This subclass/group does not cover:

Filter definition or implementation details for defining sub-band transforms	H04N 19/00824

Software or hardware implementations of Fourier, Walsh or analogous domain transformations	G06F 17/14

Informative references

Attention is drawn to the following places, which may be of interest for search:

Binary arithmetic	G06F 7/60
Execution of machine instructions	G06F 9/30
Pipelines	G06F 9/38
Resource allocation	G06F 9/50
Transfer of information, buses	G06F 13/00
Digital computing	G06F 17/00
Complex mathematical operations	G06F 17/10
General purpose image data processing, e.g. hardware architectures therefor	G06T 1/00
Decoder specific implementations	H04N 19/00533

Special rules of classification within this group

Implementation details or hardware specific for decompression require assignment of the subgroup H04N 19/00533 as well.

H04N 19/00484

[N: involving memory arrangements (H04N 19/00515 takes precedence)]

Definition statement

This subclass/group covers:

Details of memory arrangements or management specifically dedicated to video compression.

The subgroup H04N 19/0049 and its subgroups cover details of memory downsizing techniques.

References relevant to classification in this group

This subclass/group does not cover:

Techniques for memory access in motion estimation or compensation	H04N 19/00515

Informative references

Attention is drawn to the following places, which may be of interest for search:

Accessing, addressing or allocating within memory systems or architectures in general	G06F 12/00
Memory management for general purpose image data processing	G06T 1/60
Control arrangements or circuits for visual indicators common to cathode-ray tube indicators and other visual indicators, e.g. display memories	G09G 5/00
Static storage for general purpose data processing, e.g. memories, shift registers	G11C

Special rules of classification within this group

Details of the techniques used for the recompression is covered by the subgroup H04N 19/00503.

H04N 19/00533

[N: Decoders specifically adapted therefor, e.g. video decoders which are asymmetric with the encoder]

Definition statement

This subclass/group covers:

Video decoders not symmetric with the corresponding encoders, i.e. decoding means or steps are not a mere reversal of the corresponding encoding means or steps, or specific hardware or software implementations details for the video decoder.

Further details of subgroups

The subgroup H04N 19/00539 covers details of performing at the decoder the compensation of the decoding error deriving from inverse transform mismatch, e.g. Inverse Discrete Cosine Transform [IDCT] mismatch due to the digital implementation of the inverse transform, which is not the exact mathematical inverse transform.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Complex mathematical operations	G06F 17/10
Implementation details or hardware specific for video encoding and decoding	H04N 19/00478

Special rules of classification within this group

This group is only assigned, when a decoder is disclosed that is not symmetric with its corresponding encoder or when specific hardware or software implementations details are provided for the decoder.

Implementations details require entries also in the subgroups of H04N 19/00478.

H04N 19/00545

[N: for transmitting additional information in the video signal during the compression process, e.g. the additional information being encoding parameters (H04N 19/0069, H04N 19/00872, H04N 19/00884 take precedence)]

Definition statement

This subclass/group covers:

Subject matter wherein additional information is provided and transmitted within the compressed video signal, e.g. flag information or ancillary encoding information without details of syntax related data structure, watermarking.

References relevant to classification in this group

This subclass/group does not cover:

Motion vector coding and transmission	H04N 19/0069
Insertion of resynchronisation markers into the bitstream	H04N 19/00872
Syntax aspects related to video coding	H04N 19/00884

Special rules of classification within this group

Encoding parameters are generally included for transmission in the video elementary stream.

This group and its subgroups should be assigned if special details are provided about their insertion for transmission in the stream, e.g. compression is covered by H04N 19/00551.

H04N 19/00557

[N: characterised by embedding the information to be invisible]

Definition statement

This subclass/group covers:

Details of the embedding of additional information during the coding process, which is embedded into the image part or into the auxiliary information of the elementary video bit stream in order to be invisible, e.g. by watermarking.

Relationship between large subject matter areas

Invisibly embedding information at the level of the packetised stream is covered in H04N 21/00.

Invisibly embedding information in static images is covered in H04N 1/00.

Invisibly embedding information in video sequences and images in general and not within the process of digital video coding is covered in G06T 1/00.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Generation or processing of content or additional data for video distribution by content creator independently of the distribution process; Content for video distribution per se	H04N 21/80
Generation of protective data involving watermarking as additional data for video distribution	H04N 21/8358
Display, printing, storage or transmission of additional information in scanning, transmission or reproduction of documents or the like	H04N 1/32101
General purpose image watermarking	G06T 1/0021

Special rules of classification within this group

The precedence rules of the higher subgroup H04N 19/00545 do not apply to the present subgroup.

H04N 19/00563

[N: using compressed domain processing techniques other than decoding, e.g. modification of transform coefficients, of VLC data or of run-length data (motion estimation in a transform domain H04N 19/00636; Processing of decoded motion vectors H04N 19/00684)]

Definition statement

This subclass/group covers:

Details of compressed domain processing techniques other than decoding, e.g. modification of transform coefficients, of VLC data or of run-length data, filtering in the compressed domain, cf. US20070189608 (see par [0009]: 8x8 DCT coefficients are modified to embed hidden data), WO2010149554

(because of the representation Y=AX - page 5, lines 20-27: an image is represented as vector by A which is a matrix of DCT atoms -, modification of A is at DCT level), EP2091019 (see block 75 of Figure 7 reproduced below).

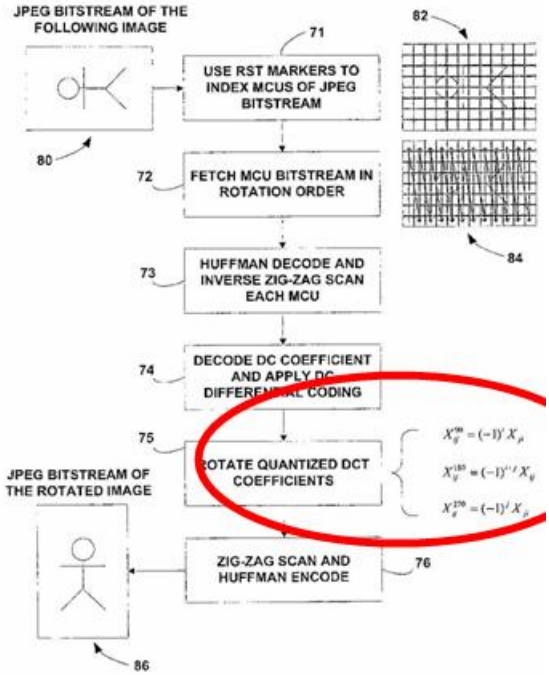


FIG. 7

References relevant to classification in this group

This subclass/group does not cover:

Motion estimation in a transform domain	H04N 19/00636
Processing of decoded motion vectors	H04N 19/00684

Special rules of classification within this group

This group should not be used when the compressed domain technique is covered by its more specific subgroups.

H04N 19/00569

[N: using predictive coding (H04N 19/00781 takes precedence)]

Definition statement

This subclass/group covers:

Predictive digital video coding techniques not otherwise provided in other subgroups.

References relevant to classification in this group

This subclass/group does not cover:

Predictive coding used in combination with transform coding	H04N 19/00781

Special rules of classification within this group

This group is a residual subgroup and should be used only when no more specific subgroups apply.

H04N 19/00575

[N: involving temporal prediction]

Definition statement

This subclass/group covers:

Predictive digital video coding techniques involving temporal prediction not otherwise provided in other subgroups.

Details of temporal prediction are classified here.

References relevant to classification in this group

This subclass/group does not cover:

Adaptive coding with adaptive selection between spatial and temporal predictive coding	H04N 19/0003
Adaptive coding with adaptive selection among a plurality of temporal predictive coding modes	H04N 19/00036

H04N 19/00581

[N: using conditional replenishment]

Definition statement

This subclass/group covers:

Temporal predictive coding using conditional replenishment, i.e. transmitting only a portion of a picture, in which a change has been detected with respect to the corresponding co-located portion of the immediately previous picture.

Conditional replenishment may be seen also as motion compensated temporal predictive encoding, using only skipping or transmission with zero motion vector.

H04N 19/00587

[N: Motion estimation or compensation therefor]

Definition statement

This subclass/group covers:

Subject matter wherein specific details of motion estimation or compensation particularly adapted to video compression are provided and is not provided otherwise for in its subgroups, e.g. specific block matching techniques.

Details of disparity estimation and compensation in stereoscopic or multi-view video coding are also covered in this group and in its subgroups.

For a synopsis of motion estimation techniques in video coding, see the figure below.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Movement detection in television systems not related to digital video coding	H04N 5/144
Conversion of standards for analogue television systems, at pixel level involving interpolation processes involving the use of motion vectors	H04N 7/014
Determining parameters from multiple pictures in general	G06T 7/0022
Analysis of motion by image analysis in general	G06T 7/20

Special rules of classification within this group

Mere mention of motion estimation or compensation does not qualify for assigning the present subgroup and its indented subgroups.

Only non trivial aspects are classified.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this subclass/group, the following terms (or expressions) are used with the

meaning indicated:

Motion vector	A two-dimensional vector used for inter prediction that provides an offset from the coordinates in the decoded picture to the coordinates in a reference picture.
Global motion estimation	Process to estimate the part of motion in a video sequence caused by camera motion, e.g. background motion by panning or zooming.
Multiresolution motion estimation	Motion estimation performed on the same picture of a video sequence at different spatial sampling resolutions (coarse-to-fine: starting from the lowest resolution; fine-to-coarse: starting from the highest resolution).
Full-search motion estimation	Motion estimation performed by exhaustive testing of all possible motion vectors within the search window.
Multi-step motion estimation	Motion estimation using an iterative method other than full search and generally simpler and sub-optimal.
Block-matching motion estimation	Classic motion estimation based on the search of a best matching block in a reference frame.
Occlusion	A part of background or of a foreground object that is hidden in one frame and then uncovered in a following frame.
(Motion) Search window	A region in a reference frame, where the search for the block or feature best matching the current block or feature is performed.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

MV	Motion Vector
GMV	Global Motion Vector
MAE	Mean Absolute Error
MAD	Mean Absolute Difference
SAD	Sum of Absolute Differences
MSE	Mean Squared Error
CCF	Cross-Correlation Function
PDC	Pixel Difference Classification

DFD	Displaced Frame Difference

In patent documents the following expressions "reference frame" and "anchor frame" are often used as synonyms.

H04N 19/00672

[N: Motion estimation based on rate-distortion criteria]

References relevant to classification in this group

This subclass/group does not cover:

Rate-distortion as a criterion for adaptive coding	H04N 19/00175

H04N 19/00684

[N: Processing of motion vectors, e.g. details on the further processing of determined or generated motion vectors]

Definition statement

This subclass/group covers:

Subject matter wherein the determined or existing motion vectors are subjected to further processing or modification, e.g. scaling of motion vectors for scalability or transcoding purposes, encoding of motion vectors, reducing or dropping of motion vectors.

Motion vector coding and predictive coding is covered in the subgroups.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Processing of encoding parameters different from motion vectors	H04N 19/00545

H04N 19/00715

[N: with multiple frame prediction using more than one reference frame in a given prediction direction]

Special rules of classification within this group

B-frames are omnipresent in encoders based e.g. on the standards MPEG-1,2,4 and H.263. Long-term prediction and multiple frame prediction are also commonplace features e.g. of the standard H.264 and of its extensions.

Therefore, said subgroups should be assigned only for non trivial aspects.

The following classification table applies:

For one reference frame per direction and Bi-directional motion estimation or compensation classify in H04N 19/00721.

For more than one reference frame per direction and Uni-directional motion estimation or compensation classify in H04N 19/00715.

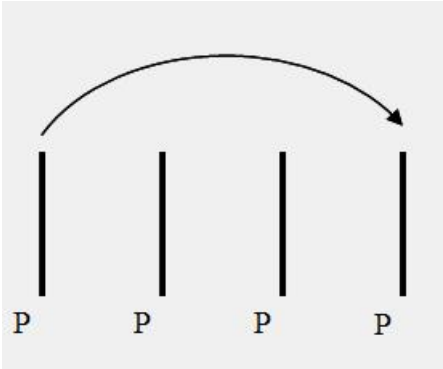
For more than one reference frame per direction and Bi-directional motion estimation or compensation classify in H04N 19/00715 and H04N 19/00721.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this subclass/group, the following terms (or expressions) are used with the

meaning indicated:

Bidirectional motion estimation and compensation	Temporal interpolation where a frame is predicted as a function both of a preceeding anchor frame and of a succeeding anchor frame, e.g. by averaging.
Long-term prediction	Prediction of a frame from an anchor frame that is not the closest anchor frame preceeding or succeeding the frame to be predicted, cf. figure. 

H04N 19/00751

[N: involving temporal sub-sampling or interpolation, e.g.

decimation or subsequent interpolation of pictures in a video sequence

Definition statement

This subclass/group covers:

Sub-sampling or interpolation in the temporal domain during digital video compression or decompression.

Relationship between large subject matter areas

Video re-sampling in the framework of standard conversion in the pixel domain (e.g. analogue television) is covered in H04N 7/01.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adaptive sampling for adaptive digital video coding	H04N 19/00127
Video compression using hierarchical techniques in the temporal domain	H04N 19/0043
Conversion of standards for analogue television systems, at pixel level involving interpolation processes	H04N 7/0135

H04N 19/00757

[N: involving spatial sub-sampling or interpolation, e.g. alteration of picture size or resolution]

Definition statement

This subclass/group covers:

Sub-sampling or interpolation in the spatial domain during digital video compression or decompression.

Details of sub-sampling or interpolation operations during motion estimation and compensation with sub-pixel accuracy are also covered here.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adaptive sampling for adaptive digital video coding	H04N 19/00127

Video compression using hierarchical techniques in the spatial domain	H04N 19/00436
Motion estimation with sub-pixel accuracy	H04N 19/0063
Conversion of standards for analogue television systems, at pixel level involving interpolation processes	H04N 7/0135
Interpolation based image scaling	G06T 3/4007

H04N 19/00763

[N: involving spatial prediction techniques]

Definition statement

This subclass/group covers:

Digital video compression involving spatial prediction techniques, e.g. details of intra prediction.

References relevant to classification in this group

This subclass/group does not cover:

Adaptive coding with adaptive selection between spatial and temporal predictive coding	H04N 19/0003
Adaptive coding with adaptive selection among a plurality of spatial predictive coding modes	H04N 19/00042

H04N 19/00769

Methods or arrangements, for coding, decoding, compressing or decompressing digital video signals using predictive coding adapted to multi-view video sequence encoding

Definition statement

This subclass/group covers:

Details of stereoscopic or multi-view digital video coding.

Relationship between large subject matter areas

Stereoscopic television systems are covered by H04N 13/00.

Stereoscopic or multi-view image processing not adapted to digital video compression is covered by G06T.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Depth recovery from multiple images in general	G06T 7/0065
Disparity estimation or compensation	H04N 19/00587

H04N 19/00775

[N: using transform coding]

Definition statement

This subclass/group covers:

Transform based digital video coding.

Relationship between large subject matter areas

Transform based video processing in general is covered in G06T, in particular G06T 3/00, G06T 5/00, G06T 7/00.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Fourier, Walsh or analogous domain transformations in general	G06F 17/14
Implementation details of DCT transforms in general	G06F 17/147

Special rules of classification within this group

Transform based digital video coding is omnipresent in digital video coding applications, because virtually all video coding standards are transform based (DCT or wavelet based).

Therefore, the group and its subgroups should be assigned when transform coding, possibly in conjunction with predictive coding, constitutes a significant non trivial detail, e.g. in combination with an entry under H04N 19/00078.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this group, the following terms are used with the meaning indicated:

Embedded Zerotrees of Wavelets [EZW]	Significance based coding technique illustrated in J. M. Shapiro, "Embedded Image Coding Using Zerotrees of Wavelet Coefficients", IEEE Transactions on Signal Processing, Vol. 41, No. 12 (1993), p. 3445-3462.
Set partitioning in hierarchical trees [SPIHT]	Significance based coding technique illustrated in A. Said, W. A. Pearlman, "A New Fast and Efficient Image Codec Based on Set Partitioning in Hierarchical Trees", IEEE Transactions on Circuits and Systems for Video Technology, Vol. 6, No. 3 (June 1996), p. 243–250.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

DCT	Discrete Cosine Transform
KLT	Karhunen-Loève Transform
DST	Discrete Sine Transform
FFT	Fast Fourier Transform
WLT	WaveLet Transform
MCTF	Motion Compensated Temporal Filtering

In patent documents the following expressions "discrete cosine transform" and "cosine transform" are often used as synonyms.

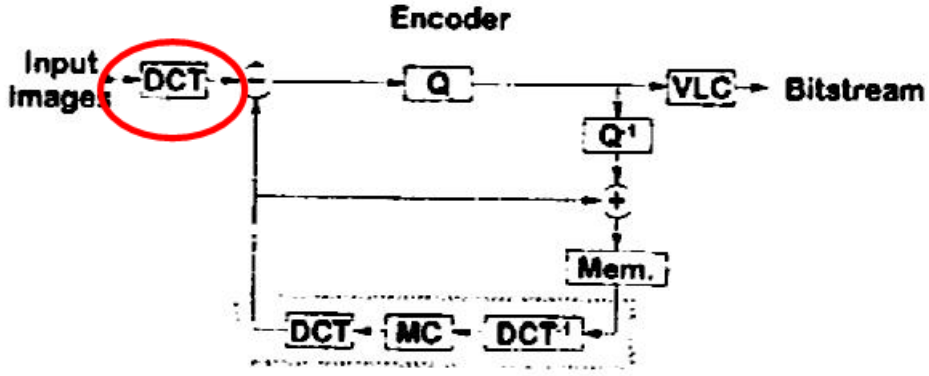
H04N 19/008

[N: the transform being operated outside the prediction loop]

Definition statement

This subclass/group covers:

Transform based predictive video coders of the type displayed in the figure below, i.e. where the transform is operated before or after the prediction loop.



H04N 19/00824

[N: characterised by filter definition or implementation details]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Implementation details or hardware specific for video compression	H04N 19/00478
Implementation details of wavelet transforms in general	G06F 17/148

H04N 19/00854

[N: using error resilience, e.g. data partitioning, resync markers or reversible VLC [RVLC]]

Definition statement

This subclass/group covers:

Techniques for error resilience in digital video coding at the level of encoding the elementary video stream.

Relationship between large subject matter areas

Error resilience techniques for storage at video servers or for channel coding adapted to video distribution are covered in H04N 21/00.

Coding, decoding or code conversion for error correction in general is covered in H03M 13/00.

Preventing errors by adapting the channel coding is covered in H04L 1/00.

References relevant to classification in this group

This subclass/group does not cover:

Places in relation to witch this group is residual:

Data partitioning, i.e. separation of data into packets or partitions according to importance	H04N 19/0086
Unequal error protection, i.e. providing more protection according to the importance of the data	H04N 19/00866
Insertion of resynchronisation markers into the bitstream	H04N 19/00872
Reversible variable length codes	H04N 19/00878

Informative references

Attention is drawn to the following places, which may be of interest for search:

Channel coding of digital bit-stream for video distribution	H04N 21/2383
Systems for detection or correction of transmission errors in the transmission of television signals using pulse code modulation	H04N 7/64

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

In this group, the following terms are used with the meaning indicated:

Resynchronisation marker	A special Variable Length Coding binary word inserted to allow re-initialisation of VLC decoding, which is forced by the marker.
Reversible Variable Length Coding	VLC allowing backward decoding of the stream, i.e. decoding of a VLC coded binary string starting from the end to the beginning.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

Resync marker	Resynchronisation marker
RVLC	Reversible Variable Length Coding
UEP	Unequal Error Protection

H04N 19/00884

[N: characterised by syntax aspects related to video coding, e.g. in relation with compression standards]

Definition statement

This subclass/group covers:

Subject matter wherein details about standards related coding syntax or about using the syntax in the coding process are provided, e.g. H.264 supplemental enhancement information (SEI), headers definitions, details of elementary stream parsing.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Syntax	The definition of the binary codes and values that make up a conforming elementary video bit stream.
Semantics	The definition of the meaning of the syntax and of the process flow for decoding the syntax elements to produce the digital video output.
Hypothetical reference decoder	A reference basic standard compliant decoder defined in the standard and constraining in terms of memory and CPU a standard compliant decoder.
Profile / Level	Operational level of a standard compliant decoder, which uses a predefined subset of the features defining the complete decoder according to the standard.The definition of the predefined subset falls also within the prescriptions of the standard.

H04N 19/0089

[N: Details of filtering operation specially adapted to video compression, e.g. for pixel interpolation (H04N 19/00824, H04N 19/00909 take precedence)]

Definition statement

This subclass/group covers:

Subject matter wherein a filtering operation specifically adapted to video compression is included but not necessarily adaptive in the video compression or decompression process, with details of the filtering operation provided.

References relevant to classification in this group

This subclass/group does not cover:

Filter definition or implementation for sub-band based transform	H04N 19/00824
Filtering for removal of coding artifacts	H04N 19/00909

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adaptive filtering operation	H04N 19/00066
Pre-processing or post-processing specifically adapted to video compression	H04N 19/00903
Image filtering for image enhancement or restoration	G06T 5/00, G06T 5/20
Impedance networks, e.g. resonant circuits, filters in general	H03H

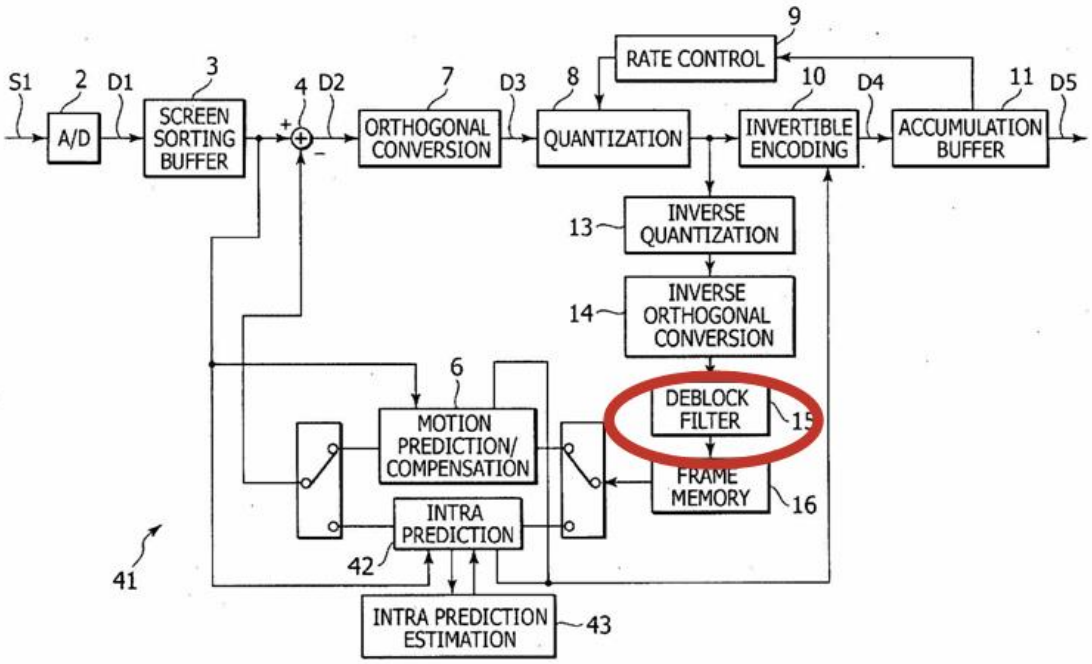
H04N 19/00896

[N: involving filtering within a prediction loop]

Definition statement

This subclass/group covers:

The insertion of the filtering within a prediction loop and details of such filter. This subgroup is of relevance, only if it contributes to define non trivial details of the filtering operation as in-loop filtering.



References relevant to classification in this group

This subclass/group does not cover:

Filter definition or implementation for sub-band based transform	H04N 19/00824

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adaptive filtering operation	H04N 19/00066

Special rules of classification within this group

Subgroups H04N 19/00896 and H04N 19/00903 describe non-trivial filtering structures regardless whether the filtering is adapted in the sense of H04N 19/00066.

So, if the filtering is in-loop, it is classified in H04N 19/00896. If it is pre or post filtering, it is classified in H04N 19/00903 and in the subgroups H04N 19/00909-H04N 19/00933. If any filtering is part of an adaptive video coding process, then, H04N 19/00066 should be additionally assigned.

Examples of relevant documents are US20010036320 (Figure 5), EP0772365 (Figure 1), US20080267297 (Figure 1, cf. the figure under H04N 19/00903).

H04N 19/00903

[N: using pre-processing or post-processing specially adapted to video compression]

Definition statement

This subclass/group covers:

Subject matter wherein the pre or post processing operation is present as a functional block but not necessarily adaptive in the video coding process, e.g. the pre or post processing is respectively performed prior to the input of, or after the output of, the video coding process.

This group is of relevance, only if the subject-matter to be classified contributes to define non trivial details of pre- or post-processing.

Informative references

Attention is drawn to the following places, which may be of interest for search:

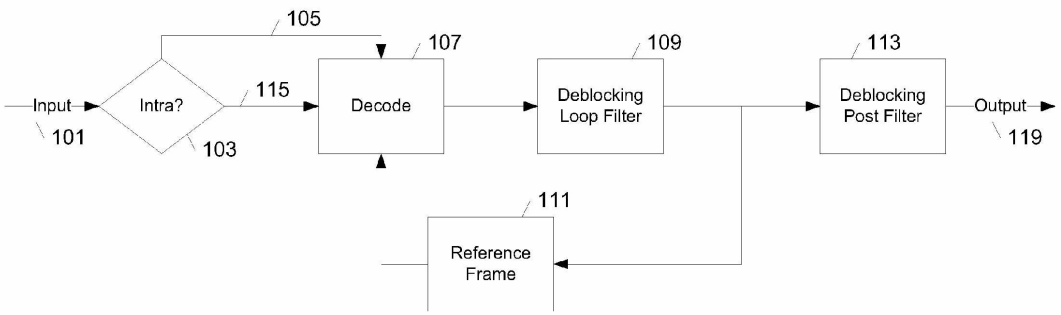
In-loop filtering	H04N 19/00896

Special rules of classification within this group

Subgroups H04N 19/00896 and H04N 19/00903 describe non-trivial filtering structures regardless whether the filtering is adapted in the sense of H04N 19/00066.

So, if the filtering is in-loop, it is classified in H04N 19/00896. If it is pre or post filtering, it is classified in H04N 19/00903 and in the subgroups H04N 19/00909-H04N 19/00933. If any filtering is part of an adaptive video coding process, then, H04N 19/00066 should be additionally assigned.

Examples of relevant documents are US20010036320 (Figure 5), EP0772365 (Figure 1), US20080267297 (Figure 1, reproduced below).



H04N 19/00909

[N: involving reduction of coding artifacts, e.g. of blockiness]

Definition statement

This subclass/group covers:

Processing techniques (e.g. filtering or interpolation in the spatial or in the temporal domain) adapted to reducing artifacts caused by digital video compression, e.g. blockiness from block-based transform compression, frame freeze or jerkiness from dropping frames at compression or transmission, false contours from limited bit depth resolution.

Further details of subgroups

The subgroup H04N 19/00915 covers details of techniques suitable for reducing blockiness artifacts, where the block subdivision applied at encoding is detected in decompressed video subsequent to video decoding.

References relevant to classification in this group

This subclass/group does not cover:

Filtering or interpolation as an error concealment technique	H04N 19/00939

Informative references

Attention is drawn to the following places, which may be of interest for search:

Image enhancement and restoration in general	G06T 5/00
Circuitry for suppressing or minimising disturbance (e.g. moiré, halo) in television systems	H04N 5/21
In-loop filtering	H04N 19/00896

H04N 19/00921

[N: involving scene cut or change detection in conjunction with video compression]

Definition statement

This subclass/group covers:

Techniques for scene cut or change detection executed in combination with video compression.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Image analysis in general	G06T 7/00
Circuitry for scene change detection in television systems.	H04N 5/147
Scene cut detection in adaptive video coding	H04N 19/00163

H04N 19/00927

[N: involving rearrangement of data among different coding units, e.g. shuffling, interleaving, scrambling, permutation of pixel data or permutation of transform coefficient data among different blocks]

Definition statement

This subclass/group covers:

Techniques for the rearrangement of data among different coding units at the level of a single elementary video stream within the operation of the video coder, e.g. shuffling, interleaving, scrambling, permutation of pixel data or permutation of transform coefficient data among different blocks.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Analogue secrecy systems in television systems	H04N 7/16
Adaptive scanning of coding units	H04N 19/00109
Processing of video elementary streams for video distribution involving video stream encryption at the transmitter side	H04N 21/2347
Processing of video elementary streams involving video stream decryption	H04N 21/4405
Processing of video elementary streams involving video stream encryption at the receiver side	H04N 21/4408

H04N 19/00933

[N: including methods or arrangements for detection of transmission errors at the decoder]

Definition statement

This subclass/group covers:

Techniques for detecting transmission errors at the digital video decoder and at the level of the elementary video stream.

Further details of subgroups

The subgroup H04N 19/00933 covers details of detection in combination with error concealment.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Coding, decoding or code conversion for error detection or error correction in general	H03M 13/00
Decoders specifically adapted for video decompression	H04N 19/00533
Methods or arrangements, for coding, decoding, compressing or decompressing digital video signals using error resilience	H04N 19/00854
Channel decoding in selective content distribution	H04N 21/4382
Monitoring of downstream path of the transmission network at the receiver side	H04N 21/44209
Monitoring of client processing errors or hardware failure in selective video distribution	H04N 21/4425
Monitoring network process errors by the network	H04N 21/6473
Detection or correction of transmission errors in systems for the transmission of television signals using pulse code modulation	H04N 7/64

H04N 19/00945

[N: using special coding techniques not provided for in groups H04N 19/00006- H04N 19/00939 , e.g. vector quantisation, quad-tree, matching pursuit or fractals]

Relationship between large subject matter areas

Video coding techniques for non-pixel based applications are covered in G06T 9/00.

References relevant to classification in this group

This subclass/group does not cover:

Using adaptive coding	H04N 19/00006
Using video coding	H04N 19/00387
Using hierarchical techniques, e.g. scalability	H04N 19/00424
Using video transcoding	H04N 19/00472
Characterised by implementation details or hardware specific for video compression or decompression	H04N 19/00478
Decoders specifically adapted therefor	H04N 19/00533
For transmitting additional information in the video signal during the compression process	H04N 19/00545
Using compressed domain processing techniques other than decoding	H04N 19/00563
Using predictive coding	H04N 19/00569
Using transform coding	H04N 19/00775
Using error resilience	H04N 19/00854
Characterised by syntax aspects related to video coding	H04N 19/00884
Details of filtering operation specifically adapted to video compression	H04N 19/0089
Using pre-processing or post-processing specifically adapted to video compression	H04N 19/00903

H04N 19/00951

[N: for entropy coding, e.g. variable length coding [VLC], arithmetic coding (entropy coding in adaptive coding H04N 19/00121)]

Definition statement

This subclass/group covers:

Subject matter wherein the entropy coding is especially adapted to video compression, e.g. specifics of table entries for fixed and variable length coding, details of MPEG Huffman coding, details of H.264 arithmetic coding.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Conversion to or from variable length codes in general	H03M 7/40
Variable length coding in an adaptive video coding process	H04N 19/00121
Run-length coding for video compression	H04N 19/00957

Special rules of classification within this group

The group H04N 19/00121 has also to be assigned, if the entropy coding is of adaptive nature.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

VLC	Variable Length Coding

H04N 19/00957

[N: involving run-length coding]

Definition statement

This subclass/group covers:

Subject matter wherein the run-length coding is especially adapted to video compression.

In run-length coding a run, i.e. a sequence of identical data values, is coded by a representation of the data value together with the length of the sequence.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Conversion to or from run-length codes in general	H03M 7/46
Variable length coding in an adaptive video coding process	H04N 19/00121

Synonyms and Keywords

In patent documents the following abbreviations are often used:

RLE	Run-Length Encoding

H04N 19/00963

[N: Vector quantisation]

Definition statement

This subclass/group covers:

Video compression using vector quantisation, i.e. by dividing a large set of points into groups (vectors)having approximately the same number of points closest to them and by representing each group by a single code, which is associated with its centroid point.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Vector coding in general	H03M 7/3082

Synonyms and Keywords

In patent documents the following abbreviations are often used:

VQ	Vector Quantisation

H04N 19/00969

[N: Tree coding, e.g. quad-tree]

Definition statement

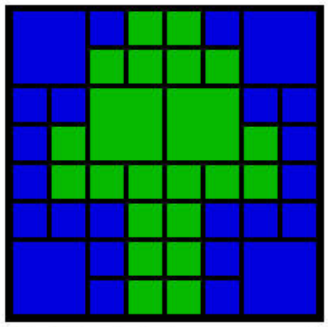
This subclass/group covers:

Video compression using tree coding.

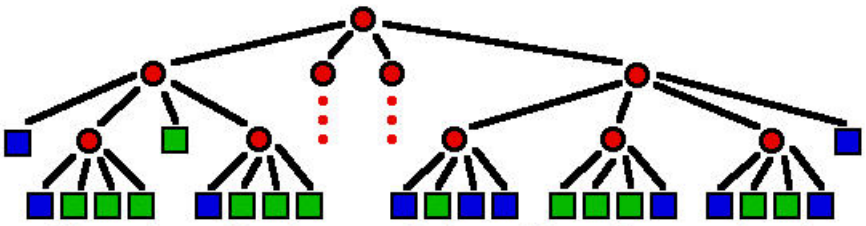
Two-dimensional tree coding is called quad-tree coding and is performed by partitioning an image or a video frame by recursively subdividing it into four quadrants or regions, until each region may be represented by a single colour or codeword, and coding the resulting tree data structure in which each internal node has exactly four children and each termination node (leaf)

corresponds to a resulting region with the colour or codeword associated to it, cf. R. Finkel and J.L. Bentley (1974). "Quad Trees: A Data Structure for Retrieval on Composite Keys". Acta Informatica 4 (1): 1–9.

Tree coding in higher dimension is defined correspondingly (e.g. octree, performed in three-dimensions by subdivision into eight volumetric regions).



8 x 8 pixel picture represented in a quad tree



The quad tree of the above example picture. The quadrants are shown in counterclockwise order from the top-right quadrant. The root is the top node. (The 2nd and 3rd quadrants are not shown.)

Informative references

Attention is drawn to the following places, which may be of interest for search:

Image coding using tree coding , e.g. quadtree, octree	G06T 9/40

H04N 19/00975

[N: Matching pursuit coding]

Definition statement

This subclass/group covers:

Video compression using matching pursuit coding, cf. G. Mallat and Z. Zhang, "Matching Pursuits with Time-Frequency Dictionaries", IEEE Transactions on Signal Processing, December 1993, pp. 3397–3415.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

MP	Matching Pursuit

H04N 19/00981

[N: Adaptive-dynamic-range coding [ADRC]]

Definition statement

This subclass/group covers:

Video compression using adaptive-dynamic-range coding, cf. Kondo et al., "Adaptive dynamic range coding scheme for future HDTV digital VTR", Proceedings of Signal Processing of HDTV, III. Fourth International Workshop on HDTV and Beyond, Turin, Italy, 4-6 Sept. 1991, p. 43-50 (XP000379937) and cf. US5444487 (Kondo et al.), Aug. 1995 (see figure below).

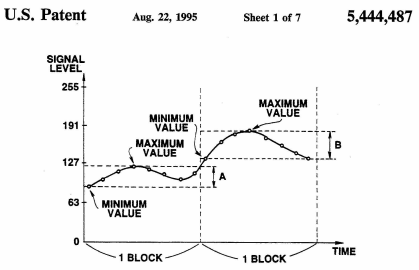


FIG.1 (PRIOR ART)

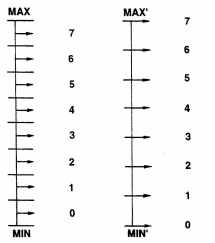


FIG.2(a) (PRIOR ART)

FIG.2(b) (PRIOR ART)

Special rules of classification within this group

The "adaptive" in the name of the technique is not per se directly related with the adaptivity defined in H04N 19/00006 and subgroups.

However, the subgroups of H04N 19/00006 should be assigned when necessary.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

ADRC	Adaptive-Dynamic-Range Coding

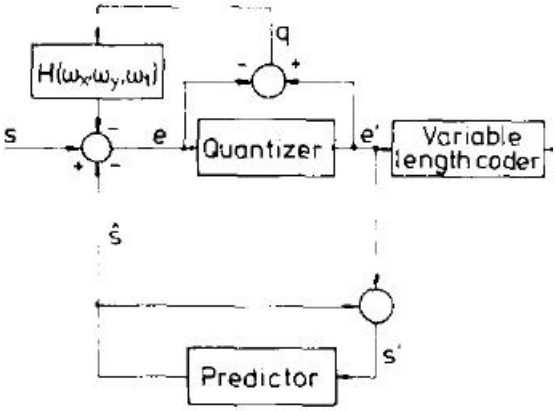
H04N 19/00987

[N: using noise or error feedback, e.g. quantisation noise feedback]

Definition statement

This subclass/group covers:

The correction of the error signal to be compressed by using a function of the detected noise or quantisation error, as in the figure.



Informative references

Attention is drawn to the following places, which may be of interest for search:

Details about quantisation, normalisation or weighting functions	H04N 19/00096

H04N 19/00993

[N: involving fractal coding]

Definition statement

This subclass/group covers:

Lossy video compression using fractal algorithms, as described in Y. Fisher, D. N. Rogovin and T.-P. J. Shen, "Fractal (Self-VQ) Encoding of Video Sequences", Proc. of the Conference on Visual Communications and Image

Processing '94, Chicago, IL, USA, 25-29 Sept. 1994, SPIE, vol. 2308, p. 1359-1370 (1994).

Informative references

Attention is drawn to the following places, which may be of interest for search:

Methods for coding digital video signals using vector quantisation	H04N 19/00963

H04N 21/00

Selective content distribution, e.g. interactive television, VOD [Video On Demand] (broadcast communication H04H ; arrangements, apparatus, circuits or systems for communication control or processing being characterised by a protocol H04L 29/06; [N: broadcast or conference over packet-switching networks H04L 12/18,] real-time bi-directional transmission of motion video data H04N 7/14)

Definition statement

This subclass/group covers:

- Interactive video distribution processes, systems, or elements thereof, which are characterised by point-to-multipoint system configurations, and which are mainly used for motion video data unidirectional distribution or delivery resulting from interactions between systems operators, e.g. access or service providers, or users e.g. subscribers, and system elements
- Such systems include dedicated communication systems, such as television distribution systems, which primarily distribute or deliver motion video data in the manner indicated, which may, in addition, provide a framework for further, diverse data communications or services in either unidirectional or bi-directional form. However, video will occupy most of the downlink bandwidth in the distribution process.
- Typically, system operators interface with transmitter-side elements or users' interface with receiver-side elements in order to facilitate, through interaction with such elements, the dynamic control of data processing or data flow at various points in the system. This interaction is typically occasional or intermittent in nature.
- Processes, systems or elements thereof specially adapted to the generation, distribution and processing of data, which is either associated with video content, e.g. metadata, ratings, or related to the user or his environment and which has been actively or passively gathered. This data is either used to facilitate interaction or to alter or target the content.

Relationship between large subject matter areas

- H04N 21/00 is an application place for a large number of IT technologies, which are covered by the corresponding functional places
- Video servers and clients use internally specific computing techniques. Corresponding techniques used in general computing are found in G06F. This concerns data storage, software architectures, error detection or correction, monitoring, video retrieval, browsing, Internet browsing, computer security, billing or advertising
- Video servers and clients use specific telecommunication techniques for the video distribution process. Corresponding techniques used in generic telecommunication networks are found in subclasses H04B, H04H, H04L, H04W. This concerns monitoring or testing of transmitters/receivers, synchronisation in time-division multiplex, broadcast or multicast, maintenance, administration, testing, data processing in data switching networks, home networks, real-time data network services, data network security, applications for data network, wireless networks per se.

References relevant to classification in this group

This subclass/group does not cover:

Storage management	**G06F3/06M**
Software architectures; Program control	G06F 9/44, G06F 9/46
Error detection or correction; Monitoring	G06F 11/00
Video retrieval; Retrieval from Internet	G06F 17/30
Computer security	G06F 21/00
Billing; Advertising	G06Q 20/00, G06Q 30/00
Monitoring or testing of transmitters/receivers	H04B 17/00
Broadcast communication	H04H
Synchronisation in time-division multiplex	H04J 3/06
Broadcast or multicast in data switching networks	H04L 12/18
Maintenance or administration in data switching networks	H04L 12/24
Data processing in data switching networks	H04L 12/56
Message switching systems	H04L 12/58
Real-time data network services	H04L 29/06176
Data network security	H04L 29/06551
Applications for data network services	H04L 29/08081

Real-time bi-directional transmission of motion video data	H04N 7/14
Wireless networks	H04W

Informative references

Attention is drawn to the following places, which may be of interest for search:

Flight-deck installations for entertainment or communications	B64D 11/0015
Resetting in general	G06F 01/14
Constructional details of equipement or arrangements specially adapted for portable computer application	G06F 01/16P3
Power management in computer systems	G06F 01/32P
Input arrangements for interaction with the human body based on nervous system activity detection	G06F 03/01B8
Interaction techniques for graphical user interfaces	G06F 03/048
RAID arrays per se	G06F 03/06D
Interfaces to printers	G06F 03/12
Digital output for controlling a plurality of local displays	G06F 03/14C
Adressing or allocating within memory systems or architectures	G06F 12/02
Prefetching while addressing of a memory level in which the access to the desired data or data block requires associative addressing means within memory systems or architectures	G06F 12/0862
Printing data	G06K 15/02
Methods or arrangements for acquiring or recognising human faces, facial parts, facial sketches, facial expressions	G06K 9/00221
Methods or arrangements for recognising movements or behaviour	G06K 9/00335
Methods or arrangements for recognising human body or animal bodies or body parts	G06K 9/00362

Methods or arrangements for recognising scenes	G06K 9/00624
Computer systems using learning methods	G06N 3/08
Banking in general	**G06Q40/00A**
Image watermarking in general	G06T 1/0021
Image enhancement or restoration in general	G06T 5/00
Adapting incoming signals to the display format of the display terminal	G09G 5/005
Details of formatting and decoding of an encoded audio signal representation into a data stream for transmission or storage purposes	**G10L19/14S**
Details of audio signal transcoding	**G10L19/14T**
Arrangements for data linking, networking or transporting, or for controlling an end to end session in a satelllite broadcast system	H04B 07/185H2
Arrangements for wireless networking or broadcasting of information in indoor or near-field type systems	**H04B10/10N3**
Allocation of channels according to the instantaneous demands of the users in time-division multiplex systems	H04J 3/1682
Arrangements for detecting or preventing errors in the information received by adapting the channel coding	H04L 1/0009
ARQ protocols	H04L 1/18
Charging arrangements in data networks	H04L 12/14
Analog front ends or means for connecting modulators, demodulators or transceivers to a transmission line	H04L 27/0002
Arrangements for synchronising receiver with transmitter	H04L 7/00
Arrangements for synchronising receiver with transmitter by comparing receiver clock with transmitter clock	H04L 7/0012
Arrangements for synchronising receiver with transmitter wherein the receiver takes measures against momentary loss of synchronisation	H04L 7/0083

Key distribution for secret or secure communication	H04L 9/08
Key distribution for secret or secure communication, using a key distribution center, a trusted party or a key server	H04L 9/0802
Arrangements for secret or secure communication including means for verifying the identity or authority of a user of the system	H04L 9/32
Diagnosis, testing or measuring for television receivers	H04N 17/04
Synchronising circuits with arrangements for extending range of synchronisation at the transmitter end	H04N 5/067
Television picture signal circuitry for Scene change detection	H04N 5/147
Reproduction of recorded television signals	H04N 5/76
Interface circuits between an apparatus for recording television signals and a television receiver	H04N 5/775
Television signal recording using magnetic recording on tape for reproducing at a rate different from the recording rate	H04N 5/783
Conversion of standards in analog television systems	H04N 7/01
Adaptations for transmission by electric cable for domestic distribution in television systems	H04N 7/106
Signal processing in analog two-way television systems	H04N 7/173
Systems for the transmission of television signals using pulse code modulation using bandwidth reduction involving transcoding	H04N 7/26941
Reproduction of recorded television signals	H04N 9/79

Special rules of classification within this group

- According to IPC rules, the full disclosure of the document is considered for classification. However classification should be limited to:

- Features providing a contribution to the invention or

- Non-claimed features, which clearly stand out from what is well known in this field and are sufficiently disclosed (thus excludes features appearing only in a list of possible alternatives, e.g. the video client being a TV receiver, Set-Top-Box, PC, mobile phone, ..)

- The scheme uses multi-dimensional classification, allowing to allocate symbols to describe a system. A short document focussing solely on one specific aspect may receive 1 or 2 symbols whereas a lengthy document with a very complex system architecture and a lot of non-trivial non-claimed features may receive 10-12 symbols
- When a whole system is disclosed its structural and functional aspects should be described according to their location in the video distribution chain (entity model):

H04N 21/2x:

for details of servers or processes related to the reception of the content from the content provider or related to the distribution of content to clients. Network interfaces are included but not the communication aspects with clients

H04N 21/4x:

for structural details of client devices or processes related among others to the processing, storing or displaying of the received content as well as user interfaces for accessing video services

H04N 21/6x:

for the nature of the downlink / uplink or the exchange of control signals or data between clients, servers, network

H04N 21/8x:

for specific multimedia content or processes taking place before distribution (usually by the content provider)

- And independently according to their appropriate layer:

H04N21/x[1-2]:

System architecture and topology

H04N21/x[3-4]:

Functional and application aspects related to bit-stream processing or elementary operations

H04N21/x[5-6]:

Functional and application aspects related to system management

H04N21/x[7-8]:

Services and functionalities offered to the end-user

- The classification scheme has thus a matrix structure and symbols taken from its different cells allow to classify the relevant aspects of a document as seen above.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Additional data	designates still pictures, textual, graphical or executable data such as software. It is used to convey supplemental information and can be generated prior to or during the distribution process itself, e.g. metadata, keys.
Content	designates video or audio streams, which may be combined with additional data. Video data will always be present and occupy most of the downlink bandwidth in the distribution process
Server	designates an apparatus designed for adapting the content received from the content provider to the distribution network. It also manages the distribution to client devices or intermediate components over a network. Further servers may also be present for gathering or generating additional data, e.g. rights management server
Additional data server	designates a server, which sole purpose is the distribution or management of additional data. It is not in charge of the distribution of video or audio data
Client	designates an apparatus such as a TV receiver, a set-top-box, a PC-TV, a mobile appliance (e.g. mobile phone or receiver in a vehicle), for receiving video, audio and possibly additional data from one or several servers or intermediate components via a network for further processing, storing or displaying. It can also transmit this data on a home-based local network to further devices, e.g. a home server transmitting video to PCs and set-top-boxes within a home.
Local network	pertains to a restricted area, e.g. a home or a vehicle, and designates the link between a client and its peripheral devices

Network	is to be distinguished from "local network": "network" designates the link between the server and the clients, or between the server and the intermediate components, or between the intermediate components and the clients, or between remotely located clients
Distribution	encompasses broadcasting, multicasting and unicasting techniques for transmitting content from one or more sources to one or more receiving stations. The distribution follows a request by a receiving station to the source, e.g. VOD or from a customization of the content by the source, e.g. targeting advertisements to a demographic group in a unidirectional or bidirectional system. Additionally, distribution encompasses techniques where the client acts as a source and another client acts as a receiving station, e.g. a peer-to-peer system for sharing video among client devices
End-user	designates a physical person, e.g. a TV viewer, who consumes the content using the client device. He is the final recipient of the content distributed by the server
Interaction	covers actions occurring between or among two or more objects that have an effect upon one another, wherein objects comprise users, system operators, system elements, or content. The user may interact with content locally at the client device, e.g. for requesting additional data stored within the client device. The user may interact with content remotely through a server e.g. for VOD playback control or for uploading video to a server. The client device may interact with the content e.g. selecting content based upon the user profile. The client device may interact with a server using a return channel, e.g. for authenticating client or uploading client hardware capabilities. The server may interact with a client device, e.g. to force a client to tune to an advertisement channel
Upstream	designates the direction of data flow towards the source, e.g. a server receiving a request via a mobile phone network
Downstream	designates the direction of data flow towards a client, e.g. a client receiving data originating from a server

Elementary stream	An elementary stream (ES) as defined by the MPEG communication protocol designates the output of an audio or video encoder

Synonyms and Keywords

In patent documents the following abbreviations are often used:

VOD	Video On Demand
SI	Service Information
IP	Internet Protocol
OS	Operating System
PCR	Program Clock References
STB	Set-top-box
PC	Personal Computer
PVR	Personal Video Recorder
GPS	Global Positioning System
ECM	Entitlement Control Message
EMM	Entitlement Management Message
ROI	Region Of Interest
PIN	Personal identification number
DSM-CC	Digital Storage Media - Command and Control Protocol
RTP	Real-time Transport Protocol
UMID	Unique Material Identifier
MHEG	Hypermedia information coding Expert Group
XML	eXtensible Markup Language

H04N 21/20

[N: Servers specifically adapted for the distribution of content, e.g. VOD servers; Operations thereof]

Definition statement

This subclass/group covers:

Subject matter comprising methods and components in the main broadcast server, headend, video-on-demand server, or server associated with the headend/video-on-demand server, which includes services, management and operations performed on the bitstream for distribution to client devices or an intermediate component over a network. The server adapts the content received from the content provider to the distribution network and only provides a network interface. Addressing issues and the exchange of control signals with the clients or the network are placed by definition in the T-model. The first layer of this subgroup pertains to the physical description of the server, e.g. its internal components, the sources of the content. The server may consist of a single physical entity or of a plurality of interconnected sub-servers. The second layer is directed to elementary specialized functions such as the storage and retrieval of the content, the processing of the elementary multimedia streams, the multiplexing thereof, the insertion of additional data, the processing of the data at the downstream and upstream network interfaces (e.g. channel coding, network adaptation, handling of clients requests), the monitoring of internal processes, e.g. server load, or of network interfaces, e.g. downstream bandwidth. The third layer describes the management of the content and of the system, such as client device or user management, scheduling issues e.g. according to bandwidth or billing policies, creation of virtual channels, management of services not directly linked to the distribution of multimedia content, e.g. billing, shopping, rights. The last layer is directed to data services directly accessible by the user, such as hosting of private data. The subgroup is directed to documents related to the insertion of server related data into a signal, such as time information inserted into EPG information. Raw multimedia data per se, is placed in H04N 21/80. The subgroup is directed to documents related to server functions, such as transmitting data to the user however, server characteristics initiated or performed on behalf of a user request is placed in the H04N 21/60. Examples of documents placed in the S-model (1) This subgroup is directed towards a server, which could be the source of additional information related to the World Wide Web. (2) This subgroup is directed towards alteration of the scene composition in regards to video objects (e.g. MPEG-2 or MPEG-4 objects). (3) This subgroup is directed towards multiplexing of video and audio streams for transmission. (4) This subgroup is directed towards the distribution of video data throughout a dwelling where the user is unaware of other users (e.g. a Hotel, Airplane or Train). Systems that provide video distribution within a dwelling where the user is aware of other users (e.g. a home gateway) is classified elsewhere. (5) This subgroup is directed to local storage built into (or next to) the server (H04N 21/218) and placement of the data onto the local storage device (H04N 21/231) (note: this is typically used in a VOD environment). Systems which are concerned about the specific details of storage or recording of video data, where the claimed invention is directed to how the video is stored or recorded (e.g. placement of the recording heads within a local storage device on a server), are classified elsewhere. (6) The subgroup is directed to documents related to the insertion of server related data into a signal, such as time information inserted into EPG information.

References relevant to classification in this group

This subclass/group does not cover:

Generation of the timestamps used for synchronization purposes	H04N 21/8547
Streaming audio/video via internet	H04N 21/6125
URLs sent in the video signal	H04N 21/8586

H04N 21/21

[N: Server components or server architectures]

Definition statement

This subclass/group covers:

Physical description of the multimedia server. As most of the components are always present (e.g. modulator, memory), a symbol should be allocated only if one of the component has a critical function in the invention. It should be further noted, that most of the components have already an entry in other technical fields and that for example the circuitry of a modulator is not part of this model. The server is used to distribute the content in a very limited geographical area, such as a single building. It is localized in the same building. It can be for example a hotel or hospital. The server and clients are localized in a movable object, such as an aircraft, a train or a bus.

H04N 21/214

[N: Specialised server platform, e.g. server located in an airplane, hotel, hospital (arrangements specially adapted for local area broadcast systems H04H 20/61)]

Definition statement

This subclass/group covers:

Servers been specially adapted to systems located in a confined environment.

References relevant to classification in this group

This subclass/group does not cover:

Arrangements specially adapted for local area broadcast systems	H04H 20/61

H04N 21/2143

[located in a single building, e.g. hotel, hospital or museum

(arrangements specially adapted for plural spots in a confined site in broadcast systems H04H 20/63; adaptations for transmission by electric cable for domestic distribution in television systems H04N 7/106)]

Definition statement

This subclass/group covers:

The server is used to distribute the content in a very limited geographical area, such as a single building. It is localized in the same building. It can be for example a hotel, multiple dwelling units, hospital or museum, movie theater if serving different projection rooms.

Example(s) of documents found in this subgroup: GB2411329

References relevant to classification in this group

This subclass/group does not cover:

Arrangements specially adapted for plural spots in a confined site in broadcast systems	H04H 20/63
Adaptations for transmission by electric cable for domestic distribution in television systems	H04N 7/106

H04N 21/2146

[located in mass transportation means, e.g. aircraft, train or bus (flight-deck installations for entertainment or communications B64D 11/0015; arrangements specially adapted for transportation systems in broadcast systems H04H 20/62; moving wireless networks H04W 84/005)]

Definition statement

This subclass/group covers:

Server and clients are localized in a movable object, such as an aircraft, a train or a bus.

Example(s) of documents found in this subgroup: EP1903800

References relevant to classification in this group

This subclass/group does not cover:

Flight-deck installations for entertainment or communications	B64D 11/0015

Arrangements specially adapted for transportation systems in broadcast systems	H04H 20/62
Moving wireless networks	H04W 84/005

H04N 21/218

[Source of audio or video content, e.g. local disk arrays (details of retrieval in video databases G06F17/30M5)]

Definition statement

This subclass/group covers:

The source, from which the multimedia server accesses the multimedia content.

References relevant to classification in this group

This subclass/group does not cover:

Details of retrieval in video databases	**G06F17/30M5**

H04N 21/21805

[enabling multiple viewpoints, e.g. using a plurality of cameras]

Definition statement

This subclass/group covers:

- The same scene shot by different cameras under different angles.
- Panoramic video.

Example(s) of documents found in this subgroup: GB2355137

H04N 21/2181

[comprising remotely distributed storage units, e.g. when movies are replicated over a plurality of video servers (distributed storage of data in a network H04L 29/08549)]

Definition statement

This subclass/group covers:

The source located remotely, like in other video servers, when all available movies are distributed over a plurality of video servers of same importance.

Example(s) of documents found in this subgroup: WO0158163

References relevant to classification in this group

This subclass/group does not cover:

Distributed storage of data in a network	H04L 29/08549
Systems involving a hierarchy between servers	H04N 21/222

H04N 21/21815

[comprising local storage units]

Definition statement

This subclass/group covers:

The video source is built into the server or next to it. It is typical for a VOD server. Example(s) of documents found in this subgroup: US2003229684

H04N 21/2182

[involving memory arrays, e.g. RAID disk arrays (RAID arrays per se G06F3/06D; use of parity to protect data in RAID systems G06F 11/1008)]

Definition statement

This subclass/group covers:

Videos stored on disk arrays.

Example(s) of documents found in this subgroup: US6587640

References relevant to classification in this group

This subclass/group does not cover:

RAID arrays per se	**G06F3/06D**
Use of parity to protect data in RAID systems	G06F 11/1008

H04N 21/21825

[involving removable storage units, e.g. tertiary storage such as magnetic tapes or optical disks]

Definition statement

This subclass/group covers:
Videos retrieved from magnetic or optical tapes.

Example(s) of documents found in this subgroup: WO9935562, XP001159230

H04N 21/2183

[Cache memory (caches in web servers or browsers G06F 17/30902; intermediate storage and caching in data networks H04L 29/08801)]

Definition statement

This subclass/group covers:
Physical aspects of the cache.

Example(s) of documents found in this subgroup: EP1315091

References relevant to classification in this group

This subclass/group does not cover:

Caching operation on the server side	H04N 21/23106
Caches in web servers or browsers	G06F 17/30902
Intermediate storage and caching in data networks	H04L 29/08801

H04N 21/2187

[Live feed]

Definition statement

This subclass/group covers:
Live feeds from cameras, or satellite at a headend.

Example(s) of documents found in this subgroup: US2007216783

H04N 21/222

[N: Secondary servers, e.g. proxy server, cable television head-end (intermediate processing or storage in data networks H04L 29/08702)]

Definition statement

This subclass/group covers:

- Local servers for serving mobile terminals.
- The concept of secondary server is used to describe a hierarchy among several servers, as for example in distributed systems.

Example(s) of documents found in this subgroup: EP1204244, WO2006130139

References relevant to classification in this group

This subclass/group does not cover:

Intermediate processing or storage in data networks	H04L 29/08702

H04N 21/2221

[N: being a cable television head-end (CATV in broadcast systems H04H 20/78)]

Definition statement

This subclass/group covers:

Local server in a broadcast system.

Example(s) of documents found in this subgroup: US7269841

References relevant to classification in this group

This subclass/group does not cover:

CATV in broadcast systems	H04H 20/78

H04N 21/2223

[N: being a public access point, e.g. for downloading to or uploading from clients (arrangements specially adapted to plural spots in a confined site in broadcast systems H04H 20/63)]

Definition statement

This subclass/group covers:

Public access point, where content can be downloaded to / uploaded from clients. Example(s) of documents found in this subgroup: WO0150401

References relevant to classification in this group

This subclass/group does not cover:

Arrangements specially adapted to plural spots in a confined site in broadcast systems	H04H 20/63

H04N 21/2225

[N: local VOD servers]

Definition statement

This subclass/group covers:

Local VOD server to serve a small area.

Example(s) of documents found in this subgroup: EP0740470

H04N 21/226

[N:Characteristics of the server or] Internal components of the server

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: US2003026280

H04N 21/2265

[N: Server identification by a unique number or address, e.g. serial number (addressing and naming in data networks H04L 29/12009)]

Definition statement

This subclass/group covers:

Identification number of the server. It can be used for authenticating the server.

Example(s) of documents found in this subgroup: WO2006101380

References relevant to classification in this group

This subclass/group does not cover:

Addressing and naming in data networks	H04L 29/12009

H04N 21/23

[N: Processing of content or additional data; Elementary server operations; Server middleware]

Definition statement

This subclass/group covers:

Elementary specialized functions. They can be implemented in software or hardware. Their task is to control the corresponding hardware component and to provide a service to the upper layer. e.g. network synchronization using a master clock for downstream/upstream transmissions. Synchronization of transmitters.

References relevant to classification in this group

This subclass/group does not cover:

Handling or recovery of errors occuring in the server	H04N 21/2404

H04N 21/231

[N: Content storage operation, e.g. caching movies for short term storage, replicating data over plural servers, prioritizing data for deletion]

Definition statement

This subclass/group covers:

Organization and the action of storage as well as writing actions. Storage can be performed in disk arrays as found in VOD servers as well as internal databases, caching of movies or data or any memory related problem.

Example(s) of documents found in this subgroup: US 7,017,174 B1

References relevant to classification in this group

This subclass/group does not cover:

Retrieving and reading data in the server	H04N 21/232
Server-side memory management	H04N 21/241

H04N 21/23103

[N: using load balancing strategies, e.g. by placing or distributing content on different disks, different memories or different servers (storage management G06F3/06M; allocation of resources considering the load in multiprogramming arrangements G06F 9/505; techniques for rebalancing the load in a distributed system G06F 9/5083; access to distributed or replicated servers, e.g. load balancing, in data networks H04L 29/08144)]

Definition statement

This subclass/group covers:

Methods describing the placement or distribution of content on different disks or different servers with the aim of providing a balanced load within the (distributed) system.

Example(s) of documents found in this subgroup: US 2004/0202444 A1

References relevant to classification in this group

This subclass/group does not cover:

Storage management	**G06F3/06M**
Allocation of resources considering the load in multiprogramming arrangements	G06F 9/505
Techniques for rebalancing the load in a distributed system	G06F 9/5083
Access to distributed or replicated servers, e.g. load balancing, in data networks	H04L 29/08144
Data replication on different disks or servers	H04N 21/23116

H04N 21/23106

[N: involving caching operations (prefetching while addressing of a memory level in which the access to the desired data or data block requires associative addressing means within memory systems or architectures G06F 12/0862; caching at an intermediate stage in a data network H04L 29/08801)]

Definition statement

This subclass/group covers:

Caching action, for example of movies in a local VOD server. The storage has a temporary aspect and must be distinguished from buffering as performed in the video encoder which holds the multimedia data for a brief period of time.

Example(s) of documents found in this subgroup: US 2002/0169926 A1

References relevant to classification in this group

This subclass/group does not cover:

Prefetching while addressing of a memory level in which the access to the desired data or data block requires associative addressing means within memory systems or architectures	G06F 12/0862
Caching at an intermediate stage in a data network	H04L 29/08801
Buffering on the encoder side	H04N 21/23406

H04N 21/23109

[N: by placing content in organized collections, e.g. EPG data repository (details of retrieval of video data and associated meta data in video databases G06F17/30M5)]

Definition statement

This subclass/group covers:

Details of the generation and the management of a local database because it is trivial that local data are always stored in some kind of database (from simple lists to complex structures).

References relevant to classification in this group

This subclass/group does not cover:

Details of retrieval of video data and associated meta data in video databases	**G06F17/30M5**

H04N 21/23113

[N: involving housekeeping operations for stored content, e.g. prioritizing content for deletion because of storage space restrictions (storage management, e.g. defragmentation

G06F3/06M; snloading stored programs G06F 9/445; housekeeping operations in file systems, e.g. deletion policies G06F 17/30067; buffering arrangements in a network node or in an end terminal in packet networks H04L12/56Q1)]

Definition statement

This subclass/group covers:

Algorithms, describing which data are prioritized for deletion (e.g. oldest or less used data) are classified here.

Example(s) of documents found in this subgroup: US 2002/0169926 A1

References relevant to classification in this group

This subclass/group does not cover:

Housekeeping operations in file systems, e.g. deletion policies	G06F 17/30067
Storage management, e.g. defragmentation	**G06F3/06M**
Unloading stored programs	G06F 9/445
Buffering arrangements in a network node or in an end terminal in packet networks	**H04L12/56Q1**

H04N 21/23116

[N: involving data replication, e.g. over plural servers (synchronization of replicated data G06F 11/1658; error detection or correction by means of data replication G06F 11/2053; replication in distributed file systems G06F 17/30067; replication in distributed file systems G06F 17/30283; replication or mirroring of data in data networks H04L 29/0854)]

Definition statement

This subclass/group covers:

Content replicated over different servers or over different hard disks.

Example(s) of documents found in this subgroup: US 2004/0202444 A1

References relevant to classification in this group

This subclass/group does not cover:

Synchronization of replicated data	G06F 11/1658
Error detection or correction by means of data replication	G06F 11/2053
Replication in distributed file systems	G06F 17/30067
Replication in distributed file systems	G06F 17/30283
Replication or mirroring of data in data networks	H04L 29/0854

H04N 21/2312

[N: Data placement on disk arrays (data placement in general G06F3/06M)]

Definition statement

This subclass/group covers:

Data block placement strategies in the disk array of video servers.

Example(s) of documents found in this subgroup: EP 1 028 587 A2

References relevant to classification in this group

This subclass/group does not cover:

Data placement in general	**G06F3/06M**

H04N 21/2315

[N: using interleaving]

Definition statement

This subclass/group covers:

- Successive file blocks stored on different disks.
- A whole sector localized on one disk only.

H04N 21/2318

[N: using striping]

Definition statement

This subclass/group covers:

A data sector distributed over several disks (RAID technology).

H04N 21/232

[N: Content retrieval operation [N: locally] within server, e.g. reading video streams from disk arrays (storage management G06F3/06M; details of querying and searching of video data from a database G06F17/30M5)]

Definition statement

This subclass/group covers:

Operations linked to the retrieval of the multimedia stream from the disks. It covers disk scheduling and file mapping

Example(s) of documents found in this subgroup: US 2007/0172205 A1

References relevant to classification in this group

This subclass/group does not cover:

Storage management	**G06F3/06M**
Details of querying and searching of video data from a database	**G06F17/30M5**
Content storage	H04N 21/231

H04N 21/2323

[N: using file mapping]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: EP 0 992 992 A1

H04N 21/2326

[N: Scheduling disk or memory reading operations]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: US 2004/0186951 A1

H04N 21/233

[N: Processing of audio elementary streams (details of formatting and decoding of an encoded audio signal representation into a data stream for transmission or storage purposes G10L19/14S; arrangements characterised by components specially adapted for monitoring, identification or recognition of audio in broadcast systems H04H 60/58)]

Definition statement

This subclass/group covers:

Audio stream management.

Example(s) of documents found in this subgroup: FR 2 850 821 A1

References relevant to classification in this group

This subclass/group does not cover:

Details of formatting and decoding of an encoded audio signal representation into a data stream for transmission or storage purposes	**G10L19/14S**
Arrangements characterised by components specially adapted for monitoring,identification or recognition of audio in broadcast systems	H04H 60/58

H04N 21/2335

[N: involving reformatting operations of audio signals, e.g. by converting from one coding standard to another (details of audio signal transcoding G10L19/14T)]

Definition statement

This subclass/group covers:

Reformatted audio stream, e.g. by converting from one coding standard to another.

Example(s) of documents found in this subgroup: US 2004/0013270 A1

References relevant to classification in this group

This subclass/group does not cover:

Details of audio signal transcoding	**G10L19/14T**

H04N 21/234

[N: Processing of video elementary streams, e.g. splicing of content streams, manipulating MPEG-4 scene graphs (video encoding or transcoding processes per se H04N 7/26)]

Definition statement

This subclass/group covers:

- Video stream management.
- The control of the encoder, video scaling and transcoding aspects, synchronization, interactive control of playback, composition of MPEG-4 objects or embedding of graphics or text.

Example(s) of documents found in this subgroup: WO 2005/117435 A1

References relevant to classification in this group

This subclass/group does not cover:

Video encoding or transcoding processes per se	H04N 7/26
Embedding	H04N 21/23892

H04N 21/23406

[N: involving management of server-side video buffer]

Definition statement

This subclass/group covers:

Buffer level control.

Example(s) of documents found in this subgroup: US 2006/0193350 A1, US 2006/0262813 A1

H04N 21/23412

[N: for generating or manipulating the scene composition of objects, e.g. MPEG-4 objects]

Definition statement

This subclass/group covers:

Spatial composition of MPEG-4 objects at the program generation using a scene graph.

Example(s) of documents found in this subgroup: US 2003/0110297 A1, US2006222071

References relevant to classification in this group

This subclass/group does not cover:

Scene rendering using a scene graph	H04N 21/44012

H04N 21/23418

[N: involving operations for analysing video streams, e.g. detecting features or characteristics (filtering for image enhancement G06T 5/00; methods or arrangements for recognising scenes G06K 9/00624; arrangements characterised by components specially adapted for monitoring, identification or recognition of video in broadcast systems H04H 60/59; television picture signal circuitry for scene change detection H04N 5/147)]

Definition statement

This subclass/group covers:

Detection of features (e.g. logo) in a video stream, extraction of characteristics directly from the video stream.

Example(s) of documents found in this subgroup: EP 1 301 039 A2

References relevant to classification in this group

This subclass/group does not cover:

Methods or arrangements for recognising scenes	G06K 9/00624
Image analysis per se	G06T 7/00
Arrangements characterised by components specially adapted for monitoring,identification or recognition of video in broadcast systems	H04H 60/59
Television picture signal circuitry for Scene change detection	H04N 5/147

H04N 21/23424

[N: involving splicing one content stream with another

content stream, e.g. for inserting or substituting an advertisement]

Definition statement

This subclass/group covers:

Splicing of at least one video stream with another stream (video or not) at the server level. It can be used for inserting or substituting a piece of video such as a commercial.

Example(s) of documents found in this subgroup: US 2007/0033633 A1, XP 2098561 A1

H04N 21/2343

[N: involving reformatting operations of video signals for distribution or compliance with end-user requests or end-user device requirements [N:(media manipulation, adaptation or conversion at the source in one way streaming for real-time multimedia communications H04L 29/06489; video transcoding H04N 7/26941)]

Definition statement

This subclass/group covers:

The original A/V stream received from the content provider is reformatted.The output format is defined here.

Example(s) of documents found in this subgroup: US 2008/001791 A1

References relevant to classification in this group

This subclass/group does not cover:

Media manipulation, adaptation or conversion at the source in one way streaming for real-time multimedia communications	H04L 29/06489
Details of conversion of video standards at pixel level	H04N 7/01
Video transcoding	H04N 7/26941

H04N 21/234309

[N: by transcoding between formats or standards, e.g. from MPEG-2 to MPEG-4 or from Quicktime to Realvideo (conversion of standards in analog television systems

H04N 7/01)]

Definition statement

This subclass/group covers:

Transcoding between standards (e.g. MPEG-2 to MPEG-4) or between format such as Quicktime to Realvideo.

Example(s) of documents found in this subgroup: US 6,747,706 B1

References relevant to classification in this group

This subclass/group does not cover:

Conversion of standards in analog television systems	H04N 7/01

H04N 21/234318

[N: by decomposing into objects, e.g. MPEG-4 objects]

Definition statement

This subclass/group covers:

The components have been coded according to MPEG-4 and become objects.

Example(s) of documents found in this subgroup: US2006221178

H04N 21/234327

[N: by decomposing into layers, e.g. base layer and one or more enhancement layers]

Definition statement

This subclass/group covers:

- Content divided in layers (e.g. base layer and one or more enhancement layers).
- MDC (multiple description coding).

Example(s) of documents found in this subgroup: WO2009002303

H04N 21/234336

[N: by media transcoding, e.g. video is transformed into a slideshow of still pictures or audio is converted into text]

Definition statement

This subclass/group covers:

- Transcoding between modalities (e.g audio to text).
- Slideshow of still pictures transformed in a video.

Example(s) of documents found in this subgroup: US 2008/0163317 A1

H04N 21/234345

[N: the reformatting operation being performed only on part of the stream, e.g. a region of the image or a time segment]

Definition statement

This subclass/group covers:

The reformatting operation is performed on part of the stream, the part being spatial region of the image or a time segment.

Example(s) of documents found in this subgroup: US 2002/0080878 A1

H04N 21/234354

[N: by altering signal-to-noise ratio parameters, e.g. requantization]

Definition statement

This subclass/group covers:

- New quantization parameters are introduced allowing to change the resolution of each video frame.
- Degradation of the signal by addition of noise.

Example(s) of documents found in this subgroup: US 2002/0152317 A1

H04N 21/234363

[N: by altering the spatial resolution, e.g. for clients with a lower screen resolution]

Definition statement

This subclass/group covers:

The server provides a video with a spatial resolution commensurate with, e.g. the display capabilities of the client

Example(s) of documents found in this subgroup: US 2006/0039478 A1

H04N 21/234372

[N: for performing aspect ratio conversion]

Definition statement

This subclass/group covers:
Server reformats video to alter aspect ratio, e.g. between 4:3 and 16:9

Example(s) of documents found in this subgroup: EP 1 679 893 A2

H04N 21/234381

[N: by altering the temporal resolution, e.g. decreasing the frame rate by frame skipping]

Definition statement

This subclass/group covers:
Alteration of the frame rate.

Example(s) of documents found in this subgroup: US 6,510,554 B1

H04N 21/23439

[N: for generating different versions]

Definition statement

This subclass/group covers:
Different versions of the same audio/video stream are created and stored for later immediate retrieval.

Example(s) of documents found in this subgroup: EP 1 796 394 A2

H04N 21/2347

[N: involving video stream encryption (arrangements for secret or secure communication H04L 9/00, analogue secrecy systems H04N 7/16; Arrangements using cryptography for the use of broadcast information or broadcast-related information H04H 60/23; arrangements for preventing the taking of data from a data transmission channel without authorisation H04L 12/22; security arrangements in wireless networks H04W 12/00)]

Definition statement

This subclass/group covers:

- Scrambling of the video stream, encryption of the content stream.
- Scrambling of multimedia content in general.

Example(s) of documents found in this subgroup: US 2002/0085734 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements using cryptography for the use of broadcast information or broadcast-related information	H04H 60/23
Arrangements for preventing the taking of data from a data transmission channel without authorisation	H04L 12/22
Multiplex stream encryption in the server	H04N 21/23895
Security arrangements in wireless networks	H04W 12/00

H04N 21/23473

[N: by pre-encrypting]

Definition statement

This subclass/group covers:

Covering encryption of content before storage in a (VOD) server, also known as off-line encryption.

Example(s) of documents found in this subgroup: WO0215578

H04N 21/23476

[N: by partially encrypting, e.g. encrypting the ending portion of a movie]

Definition statement

This subclass/group covers:

Not all of the signal is scrambled or different parts are encrypted differently, e.g. to reduce processor load or to enable a reduced quality presentation.

Example(s) of documents found in this subgroup: US 2003/0021412 A1

H04N 21/235

[N: Processing of additional data, e.g. scrambling of additional data, processing content descriptors (arrangements for simultaneous broadcast of plural pieces of information H04H 20/28)]

Definition statement

This subclass/group covers:

Insertion of software modules and additional data in the video stream. The specific nature of the additional data is not considered.

Example(s) of documents found in this subgroup: US 6,636,890 B1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for simultaneous broadcast of plural pieces of information	H04H 20/28
Calculation of the repetition rate and of the timing of insertion of additional data by the server-side scheduler	H04N 21/262
Processing of additional data on the client side	H04N 21/435

H04N 21/2351

[N: involving encryption of additional data (arrangements using cryptography for the use of broadcast information or broadcast-related information H04H 60/23)]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: WO 2005/013126 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements using cryptography for the use of broadcast information or broadcast-related information	H04H 60/23

H04N 21/2353

[N: specifically adapted to content descriptors, e.g. coding, compressing or processing of metadata]

Definition statement

This subclass/group covers:

Coding/compression or more generally modification of additional data associated with the content.

Example(s) of documents found in this subgroup: EP2037684

H04N 21/2355

[N: involving reformatting operations of additional data, e.g. HTML pages (optimising the visualization of content for information retrieval from the Internet G06F 17/30905; message adaptation based on network or terminal capabilities in stored and forward packet switching H04L 12/5825; media manipulation, adaptation or conversion at the source in one way streaming for real-time multimedia communications H04L 29/06489)]

Definition statement

This subclass/group covers:

Additional informations such as an HTML page are reformatted by the server. Translation in a different language.

Example(s) of documents found in this subgroup: WO 02/071264 A2

References relevant to classification in this group

This subclass/group does not cover:

Optimising the visualization of content for information retrieval from the Internet	G06F 17/30905
Message adaptation based on network or terminal capabilities in stored and forward packet switching	H04L 12/5825
Media manipulation, adaptation or conversion at the source in one way streaming for real-time multimedia communications	H04L 29/06489

H04N 21/2356

[N: by altering the spatial resolution]

Definition statement

This subclass/group covers:

Modified resolution of the additional information. It can be used, e.g. to reformat additional data for different destination client devices.

Example(s) of documents found in this subgroup: WO 02/33976 A1

H04N 21/2358

[N: for generating different versions, e.g. for different recipient devices]

Definition statement

This subclass/group covers:

The server generates at least one other version of the original additional data, which is available together with the orginal version.

Example(s) of documents found in this subgroup: EP 1 860 880 A2

H04N 21/236

Assembling of a multiplex stream, e.g. transport stream, by combining a video stream with other content or additional data, e.g. inserting a Uniform Resource Locator [URL] into a video stream, multiplexing software data into a video stream; Remultiplexing of multiplex streams; Insertion of stuffing bits into the multiplex stream, e.g. to obtain a constant bit-rate; Assembling of a packetized elementary stream [N: (multiplexing of data packets for data networks, e.g. RTP/UDP H04L 65/00; stereoscopic image multiplexing or transmission H04N 13/0003)]

Definition statement

This subclass/group covers:

Transport stream generation. Takes as input video or audio streams or already multiplexed AV stream (remultiplexing) and outputs a single Transport Stream.

Example(s) of documents found in this subgroup: EP 1 363 439 A1

References relevant to classification in this group

This subclass/group does not cover:

Multiplexing of data packets for data networks, e.g. RTP/UDP	H04L 29/06176

H04N 21/23602

[N: Multiplexing isochronously with the video sync, e.g. according to bit-parallel or bit-serial interface formats, as SDI]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: EP 0 777 383 A1

H04N 21/23608

[N: Remultiplexing multiplex streams, e.g. involving modifying time stamps or remapping the packet identifiers]

Definition statement

This subclass/group covers:

Modification of bitstream parameters, e.g. restamping, transmultiplexing, remapping of PIDs.

Example(s) of documents found in this subgroup: XP 2040478 A1

H04N 21/23611

[N: Insertion of stuffing data into a multiplex stream, e.g. to obtain a constant bitrate (synchronisation arrangements in time-division multiplex systems using bit stuffing for systems with different or fluctuating information rates H04J3/07B)]

Definition statement

This subclass/group covers:

Insertion of stuffing bits/bytes/packets in the packetised stream to e.g. obtain a constant bitrate.

Example(s) of documents found in this subgroup: US 2004/0008736 A1

References relevant to classification in this group

This subclass/group does not cover:

Synchronisation arrangements in time-division multiplex systems using bit stuffing for systems with different or fluctuating information rates	**H04J3/07B**

H04N 21/23614

[N: Multiplexing of additional data and video streams (arrangements for simultaneous broadcast of plural pieces of information H04H 20/28)]

Definition statement

This subclass/group covers:

Multiplexing in an MPEG stream according to the DVB standard or generally speaking, insertion of additional data in the streaming of a digital TV system.

Example(s) of documents found in this subgroup: US 6,976,266 B1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for simultaneous broadcast of plural pieces of information	H04H 20/28

H04N 21/23617

[N: by inserting additional data into a data carousel, e.g. inserting software modules into a DVB carousel (arrangements for broadcast or for distribution of identical information repeatedly in broadcast distribution systems H04H 20/16)]

Definition statement

This subclass/group covers:

Insertion in a DVB carousel.

Example(s) of documents found in this subgroup: WO 2004/082289 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for broadcast or for distribution of identical information repeatedly in broadcast distribution systems	H04H 20/16

H04N 21/2362

[N: Generation or processing of Service Information [SI]]

Definition statement

This subclass/group covers:

Generation of MPEG SI and PSI tables.

Example(s) of documents found in this subgroup: EP 0 917 370 A2

H04N 21/2365

[N: Multiplexing of several video streams]

Definition statement

This subclass/group covers:

.Example(s) of documents found in this subgroup: US 2006/0018379 A1

H04N 21/23655

[N: Statistical multiplexing, e.g. by controlling the encoder to alter its bitrate to optimize the bandwidth utilization]

Definition statement

This subclass/group covers:

The typical structure of a stat mux is a multiplexer which sends command signals back to the video coder(s) to make them change parameters (e.g. bitrate) so as to optimise the global use of the bandwidth.

Example(s) of documents found in this subgroup: EP 0 928 115 A1

H04N 21/2368

[N: Multiplexing of audio and video streams]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: US 2007/0237187 A1

References relevant to classification in this group

This subclass/group does not cover:

Generation of timestamps for synchronization purposes	H04N 21/8547

H04N 21/237

[N: Communication with additional data server]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: WO 9953689 A1

H04N 21/238

[N: Interfacing the downstream path of the transmission network, e.g. adapting the transmission rate of a video stream to network bandwidth; Processing of multiplex streams (hybrid Fiber Coaxial HFC networks for downstream channel allocation for video distribution H04L 12/2801; flow control in packet networks H04L 12/569; formation of RTP packets H04L 29/06176; application layer Quality of Service and content dependent routing H04L 29/08945)]

Definition statement

This subclass/group covers:

Processing the transport stream after its assembly and sending it over the network.

Example(s) of documents found in this subgroup: US 2008/0229365 A1, WO 002/5219 A1

References relevant to classification in this group

This subclass/group does not cover:

Hybrid Fiber Coaxial [HFC] networks for downstream channel allocation for video distribution	H04L 12/2801
Flow control in packet networks	H04L 12/569
Formation of RTP packets	H04L 29/06176

Application layer Quality of Service and content dependent routing	H04L 29/08945

H04N 21/23805

[N: Controlling the feeding rate to the network, e.g. by controlling the video pump]

Definition statement

This subclass/group covers:

The video pump is responsible for feeding the program content to the network at the correct data rate, for example after having received a control signal from the network.

Example(s) of documents found in this subgroup: US 2006/0262813 A1

References relevant to classification in this group

This subclass/group does not cover:

Video streams retrieval	H04N 21/232

H04N 21/2381

[N: Adapting the multiplex stream to a specific network, e.g. an Internet Protocol [IP] network (transmission of MPEG streams over ATM H04L 12/5601)]

Definition statement

This subclass/group covers:

Bitstream adapted to a specific network. The type of network or protocol used is classified elsewhere.

Example(s) of documents found in this subgroup: EP 1 953 936 A2

References relevant to classification in this group

This subclass/group does not cover:

Transmission of MPEG streams over ATM	H04L 12/5601

H04N 21/2383

Channel coding [N: or modulation] of digital bit-stream, e.g. QPSK modulation (arrangements for detecting or preventing errors in the information received by adapting the channel coding H04L 1/0009; analogue front ends or means for connecting modulators, demodulators or transceivers to a transmission line H04L 27/0002)

Definition statement

This subclass/group covers:

Protection of the digital bitstream (e.g. RS coding) and modulation.

Example(s) of documents found in this subgroup: US 6,591,391 B1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for detecting or preventing errors in the information received by adapting the channel coding	H04L 1/0009
Analog front ends or means for connecting modulators, demodulators or transceivers to a transmission line	H04L 27/0002

H04N 21/2385

[N: Channel allocation (H04N 21/266 takes precedence); Bandwidth allocation (H04N 21/24 takes precedence; allocation of channels according to the instantaneous demands of the users in time-division multiplex systems H04J 3/1682; arrangements for maintenance or administration in data switching networks involving bandwidth and capacity management H04L 12/2439; Admission control, resource allocation in open networks H04L 12/5692; negotiating bandwidth in wireless networks H04W 28/16)]

Definition statement

This subclass/group covers:

Channel and bandwidth allocation.

Example(s) of documents found in this subgroup: WO 03/088667 A1

References relevant to classification in this group

This subclass/group does not cover:

Allocation of channels according to the instantaneous demands of the users in time-division multiplex systems	H04J 3/1682
Arrangements for maintenance or administration in data switching networks involving bandwidth and capacity management	H04L 12/2439
Admission control, resource allocation in open networks	H04L 12/5692
Negotiating bandwidth in wireless networks	H04W 28/16

H04N 21/2387

[N: Stream processing in response to a playback request from an end-user, e.g. for trick-play]

Definition statement

This subclass/group covers:

Management of the video stream after receiving an upstream playback control signal from the client, for example in a VOD system to pause or ffwd the video stream.

Example(s) of documents found in this subgroup: US 5864682 A1

H04N 21/2389

[N: Multiplex stream processing, e.g. multiplex stream encrypting]

Definition statement

This subclass/group covers:

Processing of the transport stream as received from the network and before being adapted to the delivery medium.

Example(s) of documents found in this subgroup: US 2007/0217452 A1

H04N 21/23892

[N: involving embedding information at multiplex stream level, e.g. embedding a watermark at packet level]

Definition statement

This subclass/group covers:

- Embedding of data in a piece of content, for example picture, text in a video.
- The operations performed by a content provider at a workstation to create an interactive multimedia presentation.

Example(s) of documents found in this subgroup: EP1255249

H04N 21/23895

[N: involving multiplex stream encryption]

Definition statement

This subclass/group covers:

Only the descrambling/decrypting of the transport stream is described here. The descrambling/decrypting of the video stream is described elsewhere.

Example(s) of documents found in this subgroup: US 2008/0075285 A1

H04N 21/23897

[N: by partially encrypting, e.g. encrypting only the ending portion of a movie]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: US 2007/0160218 A1

H04N 21/239

Interfacing the upstream path of the transmission network, e.g. prioritizing client [N: content]requests (hybrid Fiber Coaxial [HFC] networks for upstream channel allocation for video distribution H04L 12/2801; flow control in data networks H04L 12/569; formation of RTP packets H04L 29/06176; application layer Quality of Service and content dependent routing of client requests H04L 29/08945)

Definition statement

This subclass/group covers:

This interface manages the uplink signals coming from all the clients and is used for example to handle requests (e.g requests for a particular multimedia service).

Example(s) of documents found in this subgroup: US 2003/0028897 A1

References relevant to classification in this group

This subclass/group does not cover:

Hybrid Fiber Coaxial [HFC] networks for upstream channel allocation for video distribution	H04L 12/2801
Flow control in data networks	H04L 12/569
Formation of RTP packets	H04L 29/06176
Application layer Quality of Service and content dependent routing of client requests	H04L 29/08945

H04N 21/2393

[N: involving handling client requests (scheduling and organising the servicing of requests in data switching networks H04L 29/08945)]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: US 2002/0078218 A1

References relevant to classification in this group

This subclass/group does not cover:

Scheduling and organising the servicing of requests in data switching networks	H04L 29/08945

H04N 21/2396

[N: characterized by admission policies (admission control, resource allocation in open networks H04L 12/5692; arrangements for network security using user profiles for access control H04L 29/06836; access security in wireless networks H04W 12/08)]

Definition statement

This subclass/group covers:

Admission policies of clients in video servers.

References relevant to classification in this group

This subclass/group does not cover:

Admission control, resource allocation in open networks	H04L 12/5692
Arrangements for network security using user profiles for access control	H04L 29/06836
Access security in wireless networks	H04W 12/08

H04N 21/24

[N: Monitoring of processes or resources, e.g. monitoring of server load, available bandwidth, upstream requests (monitoring of server performance or load G06F 11/34; monitoring or testing of transmitters in general H04B 17/0002; arrangements for observation, testing or troubleshooting for broadcast or for distribution combined with broadcast H04H 20/12)]

Definition statement

This subclass/group covers:

Monitoring is an internal process, which checks permanently user requests, the bandwidth available at the different network interfaces or any internal processes. It can generate reports of system usage.

Example(s) of documents found in this subgroup: US 2008/0270598 A1

References relevant to classification in this group

This subclass/group does not cover:

Monitoring of server performance or load	G06F 11/34
Monitoring or testing of transmitters in general	H04B 17/0002
Arrangements for observation, testing or troubleshooting for broadcast or for distribution combined with broadcast	H04H 20/12

H04N 21/2401

[N: Monitoring of the client buffer]

Definition statement

This subclass/group covers:

The server monitors the client buffer.

Example(s) of documents found in this subgroup: US 2007/0237187 A1

H04N 21/2402

[N: Monitoring of the downstream path of the transmission network, e.g. bandwidth available (traffic monitoring in data switching networks H04L 12/2418; monitoring data switching networks utilization H04L 12/2668)]

Definition statement

This subclass/group covers:

Monitoring of the available bandwidth or bit rate.

Example(s) of documents found in this subgroup: WO 2008/054926 A1, US 2007/0153692 A1

References relevant to classification in this group

This subclass/group does not cover:

Traffic monitoring in data switching networks	H04L 12/2418
Monitoring data switching networks utilization	H04L 12/2668

H04N 21/2404

[N: Monitoring of server processing errors or hardware failure (error or fault detection G06F 11/07; monitoring in general G06F 11/30)]

Definition statement

This subclass/group covers:

Detection of an error during content distribution, content loading, multiplex management, hardware failure.

Example(s) of documents found in this subgroup: US2006218600,WO0031975,US 2002/0066050 A1

References relevant to classification in this group

This subclass/group does not cover:

Error or fault detection	G06F 11/07
Monitoring in general	G06F 11/30

H04N 21/2405

[N: Monitoring of the internal components or processes of the server, e.g. server load (allocation of resources in multiprogramming arrangements G06F 9/50; performance measurement of computer activity G06F 11/34)]

Definition statement

This subclass/group covers:

The load or processing capabilities of the server are monitored.

Example(s) of documents found in this subgroup: US 2004/0202444,WO2010058215, US2008209481,

References relevant to classification in this group

This subclass/group does not cover:

Allocation of resources in multiprogramming arrangements	G06F 9/50
Performance measurement of computer activity	G06F 11/34

H04N 21/2407

[N: Monitoring of transmitted content, e.g. distribution time, number of downloads (arrangements for monitoring programmes for broadcast or for distribution combined with broadcast H04H 20/14)]

Definition statement

This subclass/group covers:

Monitoring of aired content for logging and verification purposes. It can be sent to a rights server or an advertiser for billing. Includes the number of times content has been downloaded (not requested, which is classified elsewhere).

Example(s) of documents found in this subgroup: WO 03/017640 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for monitoring programmes for broadcast or for distribution combined with broadcast	H04H 20/14

H04N 21/2408

[N: Monitoring of the upstream path of the transmission network, e.g. client requests (monitoring data switching networks utilization H04L 12/2668; protocols for scheduling and organising the servicing of requests in network applications in communication control or processing H04L 29/08945)]

Definition statement

This subclass/group covers:

- Requests from clients received at the upstream interface are monitored.
- Includes log files of client requests.

Example(s) of documents found in this subgroup: US 2004/0116067 A1

References relevant to classification in this group

This subclass/group does not cover:

Monitoring data switching networks utilization	H04L 12/2668
Protocols for scheduling and organising the servicing of requests in network applications in communication control or processing	H04L 29/08945

H04N 21/241

[N: Operating System [OS] processes, e.g. server setup (arrangements for programme control G06F 9/00; program loading or initiating in general G06F 9/445; multiprogramming arrangements G06F 9/46)]

Definition statement

This subclass/group covers:

Basic functions provided by the operating system like memory management, event handling, multitasking, multithreading, setup.

Example(s) of documents found in this subgroup: US 2004/0197073 A1

References relevant to classification in this group

This subclass/group does not cover:

Program loading or initiating in general	G06F 9/445
Multiprogramming arrangements	G06F 9/46

H04N 21/242

[N: Synchronization processes, e.g. processing of Program Clock References [PCR] (synchronisation arrangements in time-division multiplex systems H04J 3/06; arrangements for synchronising broadcast or distribution via plural systems in broadcast distribution systems H04H 20/18; arrangements for synchronising receiver with transmitter H04L 7/00; synchronising circuits with arrangements for extending range of synchronisation at the transmitter end H04N 5/067)]

Definition statement

This subclass/group covers:

Synchronization issues.

Example(s) of documents found in this subgroup: EP 1 339 182 A2

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for synchronising broadcast or distribution via plural systems in broadcast distribution systems	H04H 20/18
Synchronisation arrangements in time-division multiplex systems	H04J 3/06
Arrangements for synchronising receiver with transmitter	H04L 7/00
Synchronising circuits with arrangements for extending range of synchronisation at the transmitter end	H04N 5/067

H04N 21/25

[N: Management operations performed by the server for

facilitating the content distribution or administrating data related to end-users or client devices, e.g. end-user or client device authentication, learning user preferences for recommending movies (maintenance or administration in data networks H04L 12/24)]

Definition statement

This subclass/group covers:

Server-side system management

References relevant to classification in this group

This subclass/group does not cover:

Maintenance or administration in data networks	H04L 12/24

H04N 21/251

[N: Learning process for intelligent management, e.g. learning user preferences for recommending movies (details of learning user preferences for the retrieval of video data in a video database G06F17/30M5; computer systems using learning methods G06N 3/08)]

Definition statement

This subclass/group covers:

Server-side agents are similar to the agents implemented on the client and perform similar operations.

References relevant to classification in this group

This subclass/group does not cover:

Details of learning user preferences for the retrieval of video data in a video database	**G06F17/30M5**
Computer systems using learning methods	G06N 3/08
Client-side agents	H04N 21/466

H04N 21/252

[N: Processing of multiple end-users' preferences to derive

collaborative data]

Definition statement

This subclass/group covers:

Preference data are processed to determine similarities between users. They can be clustered to have a limited number of grous of viewers. They are used to enrich the profile of one user by adding data from similar users.

References relevant to classification in this group

This subclass/group does not cover:

Deriving a common profile for several users on the same client, e.g. family profile	H04N 21/4661

H04N 21/254

[N: Management at additional data server, e.g. shopping server, rights management server (arrangements for maintenance or administration in data networks H04L 12/24; Protocols involving third party service providers for network applications in communication control or processing H04L 29/08666)]

Definition statement

This subclass/group covers:

- Non-video distribution application.
- A whole range of services, which do not deal directly with the distribution of multimedia content. They play a crucial part of the associated business model but because of their non-technical nature, they are separated from the other management functions. They can also be provided by a 3rd party.
- Support/help center, the HLR of a mobile phone network for collecting the position of a mobile client.

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for maintenance or administration in data networks	H04L 12/24
Protocols involving third party service providers for network applications in communication control or processing	H04L 29/08666

H04N 21/2541

[N: Rights Management (protecting software against unauthorised usage in a vending or licensing environment G06F21/00N7; security in data switching network management H04L 12/2461; security management or policies for network security H04L 29/06986; access security in wireless networks H04W 12/08)]

Definition statement

This subclass/group covers:

External server specially adapted to perform rights management operations.

References relevant to classification in this group

This subclass/group does not cover:

Protecting software against unauthorised usage in a vending or licensing environment	**G06F21/00N7**
Security in data switching network management	H04L 12/2461
Security management or policies for network security	H04L 29/06986
Access security in wireless networks	H04W 12/08
Client-side monitoring of content usage	H04N 21/44204
Definition of usage data	H04N 21/8355

H04N 21/2542

[N: for selling goods, e.g. TV shopping (payment schemes, payment architectures or payment protocols for electronic shopping systems G06Q20/00K3B)]

Definition statement

This subclass/group covers:

Shopping and product management aspect. The shopping application is classified elsewhere.

References relevant to classification in this group

This subclass/group does not cover:

Payment schemes, payment architectures or payment protocols for electronic shopping systems	**G06Q20/00K3B**

H04N 21/2543

Billing [N: e.g. for subscription services] (payment schemes, architectures or protocols G06Q 20/00; e-commerce G06Q 30/00(arrangements for billing for the use of broadcast information or broadcast-related information H04H 60/21; charging arrangements in data networks H04L 12/14)

Definition statement

This subclass/group covers:

Billing aspects.

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for billing for the use of broadcast information or broadcast-related information	H04H 60/21
Charging arrangements in data networks	H04L 12/14

H04N 21/25435

[N: involving characteristics of content or additional data, e.g. video resolution or the amount of advertising]

Definition statement

This subclass/group covers:

The price depends on the nature of the program offered. It can be also inversely proportional to the amount of commercials inserted.

H04N 21/2547

[N: Third Party Billing, e.g. billing of advertiser]

Definition statement

This subclass/group covers:

Billing aspects not pertaining to the end-user or subscriber but to a third party such as an advertiser. Billing can be performed according to monitored viewer selections.

H04N 21/258

[N: Client or end-user data management, e.g. managing client capabilities, user preferences or demographics, processing of multiple end-users preferences to derive collaborative data (arrangements for services using the result on the distributing side of broadcast systems H04H 60/66; data switching network applications involving user or terminal profiles H04L 29/08918)]

Definition statement

This subclass/group covers:

Customer management. Maintains databases for storing data about the clients it is connected to and their users.

Example(s) of documents found in this subgroup: US 2003/0231854 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for services using the result on the distributing side of broadcast systems	H04H 60/66
Data switching network applications involving user or terminal profiles	H04L 29/08918

H04N 21/25808

[N: Management of client data (protocols involving terminal profiles for network applications in communication control or processing H04L 29/08927)]

Definition statement

This subclass/group covers:

The management system stores data pertaining to the client device, regardless of its user.

Example(s) of documents found in this subgroup: US 2008/0066128 A1

References relevant to classification in this group

This subclass/group does not cover:

Protocols involving terminal profiles for network applications in communication control or processing	H04L 29/08927

H04N 21/25816

[N: involving client authentication (restricting access to computer systems by authenticating users using a predetermined code G06F21/00N5A2; authentication mechanisms for network security in communication control or processing H04L 29/06755; authentication in wireless network security H04W 12/06)]

Definition statement

This subclass/group covers:

The server authenticates the client device.

Example(s) of documents found in this subgroup: US 2008/0118063 A1

References relevant to classification in this group

This subclass/group does not cover:

Restricting access to computer systems by authenticating users using a predetermined code	**G06F21/00N5A2**
Authentication mechanisms for network security in communication control or processing	H04L 29/06755
Authentication in wireless network security	H04W 12/06

H04N 21/25825

[N: involving client display capabilities, e.g. screen resolution of a mobile phone (optimising the visualisation of content during browsing in the Internet G06F 17/30905; processing of terminal status or physical abilities in wireless networks H04W 8/22; authentication in wireless network security H04W 12/06)]

Definition statement

This subclass/group covers:

Clients may being diverse by nature and have different display capabilities, e.g. TV, PC, mobile phone, PDA,..

Example(s) of documents found in this subgroup: WO 2009/002324 A1

References relevant to classification in this group

This subclass/group does not cover:

Optimising the visualisation of content during browsing in the Internet	G06F 17/30905
Reformatting of the video stream by the server, e.g. based on client parameters	H04N 21/2343
Authentication in wireless network security	H04W 12/06
Processing of terminal status or physical abilities in wireless networks	H04W 8/22

H04N 21/25833

[N: involving client hardware characteristics, e.g. manufacturer, processing or storage capabilities (allocation of resources considering hardware capabilities in multiprogramming arrangements G06F 9/5044; allocation of resources considering software capabilities in multiprogramming arrangements G06F 9/5055)]

Definition statement

This subclass/group covers:

A hardware profile contains a client ID, a STB manufacturer, model, general processing and memory/storage capabilities , except for display.

References relevant to classification in this group

This subclass/group does not cover:

Allocation of resources considering hardware capabilities in multiprogramming arrangements	G06F 9/5044
Allocation of resources considering software capabilities in multiprogramming arrangements	G06F 9/5055

H04N 21/25841

[N: involving the geographical location of the client (retrieval from the Internet by querying based on geographical locations G06F 17/3087; Arrangements for identifying locations of receiving stations in broadcast systems H04H 60/51; protocols in which the network application is adapted for the location of the user terminal in communication control or processing H04L 29/08657; services making use of the location of users or terminals in wireless networks H04W 4/02; locating users or terminals in wireless networks H04W 64/00)]

Definition statement

This subclass/group covers:

The server determines or is aware of the location of the client device. The determination can be performed by retrieving data from a HLR in a mobile phone network or by triangulation methods. This must be distinguished from user demographical data, classified elsewhere. It is typically used for targeting location dependent programs or additional informations.

Example(s) of documents found in this subgroup: WO 2006/136109 A1

References relevant to classification in this group

This subclass/group does not cover:

Retrieval from the Internet by querying based on geographical locations	G06F 17/3087
Arrangements for identifying locations of receiving stations in broadcast systems	H04H 60/51
Protocols in which the network application is adapted for the location of the user terminal in communication control or processing	H04L 29/08657
Services making use of the location of users or terminals in wireless networks	H04W 4/02
Locating users or terminals in wireless networks	H04W 64/00

H04N 21/2585

[N: Generation of a revocation list, e.g. of client devices involved in piracy acts]

Definition statement

This subclass/group covers:

The server keeps a list of client devices, which have been reported to been involoved in piracy acts, such as falsifying the decryption card.

H04N 21/25858

[N: involving client software characteristics, e.g. OS identifier]

Definition statement

This subclass/group covers:

The software profile contains a record of the type of software installed on the client, including version number for automatic upgrades.

References relevant to classification in this group

This subclass/group does not cover:

Detrails of operating systems in cients	H04N 21/443
Executable data per se	H04N 21/8166

H04N 21/25866

[N: Management of end-user data (customer care in data networks H04L 12/249)]

Definition statement

This subclass/group covers:

The management system stores data related to its users regardless of the client device they use.

References relevant to classification in this group

This subclass/group does not cover:

Customer care in data networks	H04L 12/249

H04N 21/25875

[N: involving end-user authentication (restricting access to computer systems by authenticating users using a predetermined code G06F21/00N5A2; arrangements for secret

or secure communication including means for verifying the identity or authority of a user of the system H04L 9/32; authentication mechanisms for network security in communication control or processing H04L 29/06755; authentication in wireless network security H04W 12/06)]

Definition statement

This subclass/group covers:

Storage of physical characteristics of the user (e.g. fingerprint). The server authenticates the user of the client device.

References relevant to classification in this group

This subclass/group does not cover:

Restricting access to computer systems by authenticating users using a predetermined code	**G06F21/00N5A2**
Arrangements for secret or secure communication including means for verifying the identity or authority of a user of the system	H04L 9/32
Authentication mechanisms for network security in communication control or processing	H04L 29/06755
Authentication in wireless network security	H04W 12/06

H04N 21/25883

[N: being end-user demographical data, e.g. age, family status or address (arrangements for identifying locations of users in broadcast systems H04H 60/52)]

Definition statement

This subclass/group covers:

When the user registers for the 1st time, he provides demographical data such as his gender, age, family status, profession, adress and ZIP code. Covers general interests but not viewing interests.

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for identifying locations of users in broadcast systems	H04H 60/52

H04N 21/25891

[N: being end-user preferences (retrieval of video data in a video database based on user preferences G06F17/30M5; arrangements for recognizing users' preferences H04H 60/46; protocols involving user profiles for network applications in communication control or processing H04L 29/08936; processing of user preferences or user profiles in wireless networks H04W 8/18)]

Definition statement

This subclass/group covers:

Preferences may be derived from viewing history of the user and have been collected dynamically. Preferences can also be collected at user registration by providing general interests.

References relevant to classification in this group

This subclass/group does not cover:

Retrieval of video data in a video database based on user preferences	**G06F17/30M5**
Arrangements for recognizing users' preferences	H04H 60/46
Protocols involving user profiles for network applications in communication control or processing	H04L 29/08936
Client-side monitoring of end-user	H04N 21/44213
Uploading data stored on the client to server	H04N 21/658
Processing of user preferences or user profiles in wireless networks	H04W 8/18

H04N 21/262

[N: Content or additional data distribution scheduling, e.g. sending additional data at off-peak times, updating software modules, calculating the carousel transmission frequency, delaying a video stream transmission, generating play-lists

(scheduling strategies for dispatcher in multiprogramming arrangements G06F 9/4881; arrangements for scheduling broadcast services or broadcast-related services H04H 60/06; flow control in packet networks H04L 12/569; protocols for scheduling and organising the servicing of requests, whereby a time schedule is established for servicing the requests in network applications in communication control or processing H04L 29/08963)]

Definition statement

This subclass/group covers:

The function of the scheduler is to plan the distribution of the multimedia content over time. It must guarantee, that the client can access the content, when it is supposed to. The scheduler considers a number of constraints, like different available bandwidths for example at day or night, or higher priorities if a user has paid a higher fee or the best timing for inserting a commercial (prime time). It has also to perform location resolution tasks, like for example assigning a time and channel to a TV program.

References relevant to classification in this group

This subclass/group does not cover:

Scheduling strategies for dispatcher in multiprogramming arrangements	G06F 9/4881
Arrangements for scheduling broadcast services or broadcast-related services	H04H 60/06
Flow control in packet networks	H04L 12/569
Protocols for scheduling and organising the servicing of requests, whereby a time schedule is established for servicing the requests in network applications in communication control or processing	H04L 29/08963

H04N 21/26208

[N: the scheduling operation being performed under constraints]

Definition statement

This subclass/group covers:

The scheduling algorithm performs optimization operations under constraints recevied as input data.

H04N 21/26216

[N: involving the channel capacity, e.g. network bandwidth (flow control in packet networks H04L 12/569; admission control, resource allocation in open networks H04L 12/5692; protocols for scheduling and organising the servicing of requests, whereby quality of service and priority requirements are taken into account in network applications in communication control or processing H04L 29/08954)]

Definition statement

This subclass/group covers:

The scheduler prioritizes the items to be transmiited according to the available network bandwidth.

References relevant to classification in this group

This subclass/group does not cover:

Flow control in packet networks	H04L 12/569
Admission control, resource allocation in open networks	H04L 12/5692
Protocols for scheduling and organising the servicing of requests, whereby quality of service and priority requirements are taken into account in network applications in communication control or processing	H04L 29/08954

H04N 21/26225

[N: involving billing parameters, e.g. priority for subscribers of premium services]

Definition statement

This subclass/group covers:

The scheduler defines priorities for the different items to be sent, for example according to billing policy (the user, who has been charged most will be served first).

H04N 21/26233

[N: involving content or additional data duration or size, e.g. length of a movie, size of an executable file]

Definition statement

This subclass/group covers:

Duration of a movie or TV program.

H04N 21/26241

[N: involving the time of distribution, e.g. the best time of the day for inserting an advertisement or airing a children program]

Definition statement

This subclass/group covers:

Pertains to the time of the day, week,.., for example the best time of the day for inserting a commercial or airing a program suitable for children.

H04N 21/2625

[N: for delaying content or additional data distribution, e.g. because of an extended sport event]

Definition statement

This subclass/group covers:

A TV program is delayed because of e.g. an expanded sport event.

H04N 21/26258

[N: for generating a list of items to be played back in a given order, e.g. playlist, or scheduling item distribution according to such list (retrieval of multimedia data based on playlists G06F 17/30017)]

Definition statement

This subclass/group covers:

Generation of a playlist and scheduling content items according to a playlist.

References relevant to classification in this group

This subclass/group does not cover:

Retrieval of multimedia data based on playlists	G06F 17/30017

H04N 21/26266

[N: for determining content or additional data repetition rate, e.g. of a file in a DVB carousel according to its importance (arrangements for broadcast or for distribution of identical information repeatedly in broadcast distribution systems H04H 20/16)]

Definition statement

This subclass/group covers:

Algorithms considering at which frequency a piece of data should be repeated in the carousel, for example according to its importance. Also pertains to data which is repeated at a constant frequency.

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for broadcast or for distribution of identical information repeatedly in broadcast distribution systems	H04H 20/16

H04N 21/26275

[N: for distributing content or additional data in a staggered manner, e.g. repeating movies on different channels in a time-staggered manner in a near video on demand system]

Definition statement

This subclass/group covers:

Scheduling of NVOD services. Movies are repeated on different channels in a time-staggered manner.

H04N 21/26283

[N: for associating distribution time parameters to content, e.g. to generate electronic program guide data]

Definition statement

This subclass/group covers:

Metadata, such as program descriptors is received from the content provider, which itself is not aware of a transmission schedule. Therefore the creation of the EPG data consisting of metadata and time information is performed by the scheduler. The EPG user interface for program selection by the user is

classified elsewhere.

H04N 21/26291

[N: for providing content or additional data updates, e.g. updating software modules, stored at the client (deployment, distribution, installation, update of software G06F9/445N; error detection or correction during software upgrading G06F 11/1433; arrangements for updating broadcast information or broadcast-related information H04H 60/25)]

Definition statement

This subclass/group covers:

The scheduler decides to update data or software resident in the client for example on a regular basis or according to special events.

References relevant to classification in this group

This subclass/group does not cover:

Deployment, distribution, installation, update of software	**G06F9/445N**
Error detection or correction during software upgrading	G06F 11/1433
Arrangements for updating broadcast information or broadcast-related information	H04H 60/25

H04N 21/266

[N: Channel or content management, e.g. generation and management of keys and entitlement messages in a conditional access system, merging a VOD unicast channel into a multicast channel]

Definition statement

This subclass/group covers:

Gathering multimedia content from different sources, analyzing it and creating appropriate channels for the clients. It receives input from the scheduler.

H04N 21/26603

[N: for automatically generating descriptors from content, e.g. when it is not made available by its provider, using content

analysis techniques]

Definition statement

This subclass/group covers:

Documents describing the processing of these descriptors, for example in case-based systems, where an incoming piece of content is classified with other similar ones.

H04N 21/26606

[N: for generating or managing entitlement messages, e.g. Entitlement Control Message [ECM] or Entitlement Management Message [EMM] (arrangements for conditional access to broadcast information or to broadcast-related services H04H 60/14)]

Definition statement

This subclass/group covers:

Generation and management of entitlement messages in a conditional access system. Pertains to ECM and EMM only.

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for conditional access to broadcast information or to broadcast-related services	H04H 60/14

H04N 21/26609

[N: using retrofitting techniques, e.g. by re-encrypting the control words used for pre-encryption]

Definition statement

This subclass/group covers:

Trans-encryption of the ECMs resulting from pre-encryption (or re-encryption of the control words used for pre-encryption) for use with a different transmission key, also known as encryption renewal.

H04N 21/26613

[N: for generating or managing keys in general (key

distribution for secret or secure communication, using a key distribution center, a trusted party or a key server H04L 9/0802; key management for security in wireless networks H04L 29/06707; key management for network security in communication control or processing H04W 12/04)]

Definition statement

This subclass/group covers:

Generation and management of keys on the server side.

References relevant to classification in this group

This subclass/group does not cover:

Key distribution for secret or secure communication, using a key distribution center, a trusted party or a key server	H04L 9/0802
Key management for security in wireless networks	H04L 29/06707
Key management for network security in communication control or processing	H04W 12/04

H04N 21/26616

[N: for merging a unicast channel into a multicast channel, e.g. in a VOD application, when a client served by unicast channel catches up a multicast channel to save bandwidth (data multicast over packet-switching network H04L 12/18)]

Definition statement

This subclass/group covers:

Different channels can be merged in a single one. For example, in a VOD application, a client served by unicast channel catches up a multicast channel. Stream merging allows to minimize bandwidth.

References relevant to classification in this group

This subclass/group does not cover:

Data multicast over packet-switching network	H04L 12/18

H04N 21/2662

[N: Controlling the complexity of the video stream, e.g. by scaling the resolution or bitrate of the video stream based on the client capabilities]

Definition statement

This subclass/group covers:

The server controls the complexity of the video stream, for example based on its capabilities.

H04N 21/2665

[N: Gathering content from different sources, e.g. Internet and satellite]

Definition statement

This subclass/group covers:

How content is retrieved from different sources (e.g. satellite and internet) or from different content providers.

H04N 21/2668

[N: Creating a channel for a dedicated end-user group, e.g. insertion of targeted commercials based on end-user profiles (information retrieval from the Internet by querying with filtering and personalisation G06F 17/30867; arrangements for replacing or switching information during the broadcast H04H 20/10; push services over packet-switching network H04L 12/1859; adaptation of message content in packet-switching networks H04L 12/583)]

Definition statement

This subclass/group covers:

- Generation of a personalized channel for one or a group of clients, according to their preferences. It also receives data from the scheduler.
- Describes the insertion of targeted commercials by the server (with no further details at bitstream level).

References relevant to classification in this group

This subclass/group does not cover:

Information retrieval from the Internet by querying with filtering and personalisation	G06F 17/30867
Arrangements for replacing or switching information during the broadcast	H04H 20/10
Push services over packet-switching network	H04L 12/1859
Adaptation of message content in packet-switching networks	H04L 12/583

H04N 21/27

[N: Server based end-user applications]

Definition statement

This subclass/group covers:

Aplications, where the end-user is aware that they are residing on the server, such as video hosting.

H04N 21/274

[N: Storing end-user multimedia data in response to end-user request [N:, e.g. network recorder]]

Definition statement

This subclass/group covers:

Storage of private data based on the explicit request of the end-user. The server holds private data received from the client as an extra service.

References relevant to classification in this group

This subclass/group does not cover:

Management of user data for administrative purposes	H04N 21/25866

H04N 21/2743

[N: Video hosting of uploaded data from client]

Definition statement

This subclass/group covers:

Personal videos have been uploaded by clients, for example to be viewed by

other users.

H04N 21/2747

[N: Remote storage of video programs received via the downstream path, e.g. from the server]

Definition statement

This subclass/group covers:

The source can be a storage dedicated for each user for example to record movies if the capacity of his hard disk is not sufficient.

H04N 21/278

[N: Content descriptor database or directory service for end-user access (details of content or meta data based information retrieval of video data in video databases G06F17/30M5)]

Definition statement

This subclass/group covers:

Creation of directory services, for example by indexing metadata for easy retrieval (keyword search of movies).

References relevant to classification in this group

This subclass/group does not cover:

Details of content or meta data based information retrieval of video data in video databases	**G06F17/30M5**

H04N 21/40

[N: Client devices specifically adapted for the reception of or interaction with content, e.g. set-top-box [STB]; Operations thereof (arrangements for distribution where lower stations, e.g. receivers, interact with the broadcast H04H 20/38; arrangements specially adapted for receiving broadcast information H04H 40/00)]

Definition statement

This subclass/group covers:

Subject matter directed to the structure or operation of the client or end user device, such as a TV receiver, a set-top-box, a PC-TV, a mobile appliance (e.g. mobile phone or vehicle), being defined as receiving video and possibly additional data from one or several servers or intermediate component via network for further processing, storing and displaying. This also includes the transmission of these data on a home-based local network to further devices. The client extracts the raw multimedia content from the streams received from possibly heterogeneous sources (e.g. internet, broadcast network) and only provides a network interface. Exchange of control signals with the server or the network are placed by definition in the T-model as well as the uploading of client data to the server.

The first layer of this subgroup pertains to the physical description of the client and attached devices, e.g. its internal components, plug-in cards, input means, peripherals.

The second layer is directed to elementary specialized functions such as the processing of the data received from the downstream network interface (e.g. channel decoding, descrambling) and transmitted from the upstream network interface, the demultiplexing into elementary streams and the processing thereof, the extraction of additional data, the local storage of the content within the client device or its forwarding to peripheral devices via a local network, the combined display of several pieces of content on the same screen (e.g. news ticker, advertisement in a separate window), the monitoring of e.g. internal processes, user actions, network bandwidth. This layer also encompasses the software structure of the client device.

The third layer describes high level functions such as the selection of content (e.g. in unidirectional systems where the whole content is sent to the client), the management of content usage (e.g. conditional access, rights), the creation of local virtual channels (e.g. by combining streams retrieved from the broadcast network and the hard disk), the adaptation by learning of internal parameters (e.g. viewer profile).

The last layer is directed to services or applications as provided to the end user of the system such as defining setting parameters, selecting programs, making requests to the server or accessing additional services (e.g. banking, shopping, WWW browsing, gaming).

The subgroup is directed to documents related to the reception and processing of received data.

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for distribution where lower stations, e.g. receivers, interact with the broadcast	H04H 20/38

Arrangements specially adapted for receiving broadcast information	H04H 40/00
Transmission and reception details at the client device	H04N 21/40
Raw multimedia data per se	H04N 21/80

H04N 21/41

[N: Structure of client; Structure of client peripherals]

Definition statement

This subclass/group covers:

Hardware level. Physical description of the multimedia client. As most of the components are always present (e.g. tuner, memory), there is no need to describe them all to avoid unnecessary classification work. An index should be allocated only if one of the component has a critical function in the invention. It should be further noted, that most of the components have already an entry in other technical fields and that for example the circuitry of a tuner is not part of this model.

Example(s) of documents found in this subgroup: WO 2006/017436 A2

H04N 21/4104

[N: using peripherals receiving signals from specially adapted client devices]

Definition statement

This subclass/group covers:

A peripheral is considered here as an external device, which receives multimedia data from the client (which excludes cards) being in the immediate vicinity of the client (same room or house). The most common example is the video recorder but other devices on a home network are possible. Covered are also PDA, game console or remote controls with a display.

Example(s) of documents found in this subgroup: US 2007/0143801 A1

References relevant to classification in this group

This subclass/group does not cover:

Input-only peripherals	H04N 21/422
Communication aspects with peripherals	H04N 21/436

H04N 21/4108

[N: characterized by an identification number or address, e.g. local network address (protecting specific internal or external computer components used for computing or processing information by creating or determining hardware identification G06F21/00N1C2; addressing and naming in data networks H04L 29/12009)]

Definition statement

This subclass/group covers:

Identification number of the peripheral device, network address on the local network.

Example(s) of documents found in this subgroup: US 2007/0254651 A1

References relevant to classification in this group

This subclass/group does not cover:

Protecting specific internal or external computer components used for computing or processing information by creating or determining hardware identification	**G06F21/00N1C2**
Addressing and naming in data networks	H04L 29/12009

H04N 21/4113

[N: PC]

Definition statement

This subclass/group covers:

The client device, typically a STB here, is connected to a personal computer, allowing e.g. to extract data or software multiplexed with the video signal and to forward it to a PC.

Example(s) of documents found in this subgroup: US 2005/ 0146598 A1

H04N 21/4117

[N: for generating hard copies of the content, e.g. printer, electronic paper (interfaces to printers G06F 3/12; printing data G06K 15/02)]

Definition statement

This subclass/group covers:

The printer can be used for printing coupons or any additional data received by the STB. Covers also electronic paper.

Example(s) of documents found in this subgroup: EP 1492338 A1

References relevant to classification in this group

This subclass/group does not cover:

Interfaces to printers	G06F 3/12
Printing data	G06K 15/02

H04N 21/4122

[N: additional display device, e.g. video projector (digital output for controlling a plurality of local displays G06F 3/1423)]

Definition statement

This subclass/group covers:

Additional display device, e.g. projector. Excludes the main display device (e.g. TV set), which is always present.

Example(s) of documents found in this subgroup: US 2009/0040233 A1

References relevant to classification in this group

This subclass/group does not cover:

Digital output for controlling a plurality of local displays	G06F 3/1423

H04N 21/4126

[N: portable device, e.g. remote control with a display, PDA, mobile phone (constructional details of equipment or arrangements specially adapted for portable computer application G06F 1/1626)]

Definition statement

This subclass/group covers:

Device receiving data from the client device, being typically a remote control with a display, a PDA or a mobile phone. Excludes PC, printer, additional display, recorder.

Example(s) of documents found in this subgroup: EP 2023350 A1

References relevant to classification in this group

This subclass/group does not cover:

Constructional details of equipment or arrangements specially adapted for portable computer application	G06F 1/1626

H04N 21/4131

[N: home appliance, e.g. lighting, air conditioning system, metering devices (home automation data switching networks exchanging configuration information on appliance services H04L 12/2807)]

Definition statement

This subclass/group covers:

A home appliance can be a lighting or an air conditioning system or metering devices.

Example(s) of documents found in this subgroup: WO 2008/0181 02 A2

References relevant to classification in this group

This subclass/group does not cover:

Home automation data switching networks exchanging configuration information on appliance services	H04L 12/2807

H04N 21/4135

[N: external recorder (interface circuits between an apparatus for recording television signals and a television receiver H04N 5/775)]

Definition statement

This subclass/group covers:

A recording device can be a VCR an external hard disk. DVD players as source of video or additional data are also covered here. Personal video recorders with an internal hard disk are covered elsewhere.

Example(s) of documents found in this subgroup: US 2008/0002951 A1

References relevant to classification in this group

This subclass/group does not cover:

Interface circuits between an apparatus for recording television signals and a television receiver	H04N 5/775

H04N 21/414

[N: Specialised client platforms, e.g. receiver in car or embedded in a mobile appliance]

Definition statement

This subclass/group covers:

different emodiments of video client platforms.

H04N 21/41407

[N: embedded in a portable device, e.g. video client on a mobile phone, PDA, laptop (constructional details of equipment or arrangements specially adapted for portable computer application G06F 1/1626; arrangements specially adapted for mobile receivers in broadcast systems H04H 20/57)]

Definition statement

This subclass/group covers:

The client device is a mobile phone, a PDA or any portable device.

Example(s) of documents found in this subgroup: WO 2008/097006 A1

References relevant to classification in this group

This subclass/group does not cover:

Constructional details of equipment or arrangements specially adapted for portable computer application	G06F 1/1626

Arrangements specially adapted for mobile receivers in broadcast systems	H04H 20/57

H04N 21/41415

[N: involving a public display, viewable by several users in a public space outside their home, e.g. movie theatre, information kiosk]

Definition statement

This subclass/group covers:

Display device viewable by several users in a public space outside their home (e.g. movie theater, information kiosk). Excludes access points for downloading informations.

Example(s) of documents found in this subgroup: WO 2007/067235 A1

H04N 21/41422

[N: located in transportation means, e.g. personal vehicle (arrangements specially adapted for transportation systems in broadcast systems H04H 20/62)]

Definition statement

This subclass/group covers:

The client device is located in a vehicle, e.g. car entertainment system.

Example(s) of documents found in this subgroup: WO 2006/136109 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements specially adapted for transportation systems in broadcast systems	H04H 20/62

H04N 21/4143

[N: embedded in a] Personal Computer [PC]]

Definition statement

This subclass/group covers:

The client device is a personal computer but not a portable device.

Example(s) of documents found in this subgroup: EP 0 834798 A2

H04N 21/4147

[N: Personal Video Recorder [PVR] (H04N 5/76 takes precedence; arrangements for broadcast specially adapted for accumulation-type receivers H04H 20/40)]

Definition statement

This subclass/group covers:

The client device is a personal video recorder, STB with hard disk, Tivo, ..

Example(s) of documents found in this subgroup: WO2006/015186 82

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for broadcast specially adapted for accumulation-type receivers	H04H 20/40
Television signal recording	H04N 5/76

H04N 21/418

[N: External card to be used in combination with the client device, e.g. for conditional access]

Definition statement

This subclass/group covers:

A card is an external component, which can be inserted in a dedicated slot. It can be a smart card for a conditional access system or an extension module to upgrade the STB capabilities.

Example(s) of documents found in this subgroup: WO 2007/141644 A2

References relevant to classification in this group

This subclass/group does not cover:

DVB common interfaces	H04N 21/43607

H04N 21/4181

[N: for conditional access]

Definition statement

This subclass/group covers:

The card holds a key for Conditional Access purposes (descrambling) or other decryption operations.

Example(s) of documents found in this subgroup: EP 1819163 A1

H04N 21/4182

[N: for identification purposes, e.g. storing user identification data, preferences, personal settings or data (restricting access to computer systems by authenticating users using a predetermined code in combination with an additional device, e.g. dongle or smart card G06F21/00N5A2D)]

Definition statement

This subclass/group covers:

The card holds identification data of the user, preferences, personal settings or any kind of personal data.

Example(s) of documents found in this subgroup: EP 1906650 A2

References relevant to classification in this group

This subclass/group does not cover:

Restricting access to computer systems by authenticating users using a predetermined code in combination with an additional device, e.g. dongle or smart card	**G06F21/00N5A2D**

H04N 21/4183

[N: providing its own processing capabilities, e.g. external module for video decoding]

Definition statement

This subclass/group covers:

The card has its own processing capabilities (e.g. external module for video decoding).

Example(s) of documents found in this subgroup: EP 1309182 A2

H04N 21/4184

[N: providing storage capabilities, e.g. memory stick]

Definition statement

This subclass/group covers:

Extension module or storage capabilities, e.g. memory stick.

Example(s) of documents found in this subgroup: US 2006/0257101 A1

H04N 21/4185

[N: for payment (mechanisms actuated by coded identity card or credit card to free or to actuate vending, hiring, coin or paper currency dispensing or refunding apparatus G07F 7/08; payment schemes, architectures or protocols G06Q 20/00; e-commerce G06Q 30/00; charging arrangements in data networks H04L 12/14)]

Definition statement

This subclass/group covers:

Bank, credit card or prepaid card, to be used e.g. in TV shopping applications.

Example(s) of documents found in this subgroup: US 2005/0001940 A1

References relevant to classification in this group

This subclass/group does not cover:

Charging arrangements in data networks	H04L 12/14

H04N 21/422

[N: using] Input-only peripherals [N:i.e. input devices connected to specially adapted client devices (input devices also receiving signals from specially adapted client devices H04N 21/4104)], e.g. Global Positioning System [GPS] (input arrangements or combined input and output arrangements for interaction between user and computer G06F 3/01)

Definition statement

This subclass/group covers:

Devices used to send information and control signals from the user and its

environment to the client. It includes remote controls, keyboards, mouses, microphones as well as cameras or biosensors.

Example(s) of documents found in this subgroup: US 2005/0212911 A1

References relevant to classification in this group

This subclass/group does not cover:

Peripherals receiving signals from client devices	H04N 21/4104

H04N 21/42201

[N: biosensors, e.g. heat sensor for presence detection, EEG sensors or any limb activity sensors worn by the user (Input arrangements for interaction with the human body based on nervous system activity detection G06F 3/015)]

Definition statement

This subclass/group covers:

Can be used as passive input from the user. Such devices can be heat sensor for presence detection, EEG sensors or any limb activity sensors worn by the user.

Example(s) of documents found in this subgroup: EP 1991001 A1

References relevant to classification in this group

This subclass/group does not cover:

Input arrangements for interaction with the human body based on nervous system activity detection	G06F 3/015

H04N 21/42202

[N: environmental sensors, e.g. for detecting temperature, luminosity, pressure, earthquakes]

Definition statement

This subclass/group covers:

Sensors connected to the client allow to determine e.g. temperature, luminosity, pressure, earthquakes. Includes position sensors (e.g. GPS).

Example(s) of documents found in this subgroup: US 2002/0142722 A1

H04N 21/42203

[N: sound input device, e.g. microphone]

Definition statement

This subclass/group covers:

Any sound input device. Can be used to generate audio streams or to enter voice commands.

Example(s) of documents found in this subgroup: US 2009/0030681 A1

H04N 21/42204

[N: User interfaces specially adapted for controlling a client device through a remote control device; Remote control devices therefor (interaction techniques for graphical user interfaces in general, see G06F 3/048; computer pointing devices in general, see G06F 3/033; user interfaces for controlling a tuning device of a television receiver through a remote control H03J 9/00; constructive details of casings for the remote control device H01H 9/0235; remote control of peripheral devices connected to a television receiver through the remote control device of the television receiver H04B 1/205; remote control devices in general G08C)]

Definition statement

This subclass/group covers:

Only remote control devices transmitting input data to the client device and located in the direct vicinity thereof are classified here.

Example(s) of documents found in this subgroup: DE 10 2006 028 505 A1

References relevant to classification in this group

This subclass/group does not cover:

Interaction techniques for graphical user interfaces in general	G06F 3/048
Computer pointing devices in general	G06F 3/033
User interfaces for controlling a tuning device of a television receiver through a remote control	H03J 9/00

Constructive details of casings for the remote control device	H01H 9/0235
Remote control of peripheral devices connected to a television receiver through the remote control device of the television receiver	H04B 1/205
Remote control devices in general	G08C

H04N 21/4223

[N: Cameras (H04N 5/225 takes precedence)]

Definition statement

This subclass/group covers:

The camera allows the client to become a video source, for example for uploading videos to a server, or identification purposes. Camera has the meaning of image generating device and covers also scanner (paper, fingerprint, retina) or any kind of imaging device. The camera allows the client to become a video source. It can be used for identifying the user or uploading videos to the server.

Example(s) of documents found in this subgroup: WO 2007/105246 A2

References relevant to classification in this group

This subclass/group does not cover:

Television cameras	H04N 5/225

H04N 21/4227

[N: Providing] Remote input by a user located remotely from the client device, e.g. at work

Definition statement

This subclass/group covers:

The client device is controlled by an input device located at a distant location. A possible application could be that a user uses a mobile phone, a PDA or an office PC to program his STB at home. Input and client device are connected by a wide area network (e.g. internet).

Example(s) of documents found in this subgroup: US 2007/0099560 A1

H04N 21/426

[N: Characteristics of or] Internal components of the client (H04N 5/44 takes precedence)

Definition statement

This subclass/group covers:

- Internal components such as tuner, demodulator, demultiplexer, descrambler, video/audio decoder, CPU, volatile memory, hard disk, graphics board/circuitry, modem. It should be noted that certain components are typical for a multimedia client, like the ones used for video processing or the receiver circuitry.
- Additonal built-in cards.

Example(s) of documents found in this subgroup: WO 2007/057482 A1

References relevant to classification in this group

This subclass/group does not cover:

Receiver circuitry	H04N 5/44

H04N 21/42607

[N: for processing the incoming bitstream]

Definition statement

This subclass/group covers:

Pieces of hardware processing the incoming bitstream.

Example(s) of documents found in this subgroup: US 2008/0120676 A1

H04N 21/42615

[N: involving specific demultiplexing arrangements]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: US 2008/0144747 A1

H04N 21/42623

[N: involving specific decryption arrangements]

Definition statement

This subclass/group covers:
Example(s) of documents found in this subgroup: EP 1487211 A3

H04N 21/4263

[N: involving specific tuning arrangements, e.g. two tuners]

Definition statement

This subclass/group covers:
The presence of at least 2 tuners in a client device.

Example(s) of documents found in this subgroup: US 2007/0035668 A1

H04N 21/42638

[N: involving a hybrid front-end, e.g. analog and digital tuners]

Definition statement

This subclass/group covers:
Example(s) of documents found in this subgroup: US 2007/0035668 A1

H04N 21/42646

[N: for reading from or writing on a non-volatile solid state storage medium, e.g. DVD, CD-ROM]

Definition statement

This subclass/group covers:
Internal reader / writer for DVD's, CD-ROM's and similar disks

Example(s) of documents found in this subgroup: WO 2007/088511 A1

H04N 21/42653

[N: for processing graphics]

Definition statement

This subclass/group covers:
Example(s) of documents found in this subgroup: WO 00/28518

H04N 21/42661

[N: for reading from or writing on a magnetic storage medium, e.g. hard disk drive]

Definition statement

This subclass/group covers:
Example(s) of documents found in this subgroup: US 2003/0108331 A1

H04N 21/42669

[N: the medium being removable]

Definition statement

This subclass/group covers:
Removable hard disk within a client.

Example(s) of documents found in this subgroup: EP1883234 A2

H04N 21/42676

[N: for modulating an analog carrier signal to encode digital information or demodulating it to decode digital information, e.g. ADSL or cable modem]

Definition statement

This subclass/group covers:
Example(s) of documents found in this subgroup: US 2004/0123329 A1

H04N 21/42684

[N: Client identification by a unique number or address, e.g. serial number, MAC address, socket ID (addressing and naming in data networks H04L 29/12009)]

Definition statement

This subclass/group covers:
Hardware identification or serial number, also MAC address, socket ID.

Example(s) of documents found in this subgroup: EP 1359710 A2

References relevant to classification in this group

This subclass/group does not cover:

Addressing and naming in data networks	H04L 29/12009

H04N 21/42692

[N: for reading from or writing on a volatile storage medium, e.g. Random Access Memory [RAM]]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: EP 1758402 A1

H04N 21/43

[N: Processing of content or additional data, e.g. demultiplexing additional data from a digital video stream; Elementary client operations, e.g. monitoring of home network, synchronizing decoder's clock; Client middleware (demultiplexing of data packets for data networks, e.g. RTP/UDP H04L 29/06176)]

Definition statement

This subclass/group covers:

Elementary specialized functions. They can be implemented in software or hardware. Their task is to control the corresponding hardware component and to provide a service to the upper layer.

References relevant to classification in this group

This subclass/group does not cover:

Demultiplexing of data packets for data networks, e.g. RTP/UDP	H04L 29/06176

H04N 21/4302

[N: Content synchronization processes, e.g. decoder synchronisation]

H04N 21/4305

[N: Synchronizing client clock from received content stream, e.g. locking decoder clock with encoder clock, extraction of

the PCR packets (arrangements for synchronising receiver with transmitter by comparing receiver clock with transmitter clock H04L 7/0012; arrangements for synchronising receiver with transmitter wherein the receiver takes measures against momentary loss of synchronisation H04L 7/0083)]

Definition statement

This subclass/group covers:

Clock recovery (extraction of the PCR packets).

Example(s) of documents found in this subgroup: US 2008/0170593 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for synchronising receiver with transmitter by comparing receiver clock with transmitter clock	H04L 7/0012
Arrangements for synchronising receiver with transmitter wherein the receiver takes measures against momentary loss of synchronisation	H04L 7/0083

H04N 21/4307

[N: Synchronizing display of multiple content streams, e.g. synchronisation of audio and video output or enabling or disabling interactive icons for a given period of time]

Definition statement

This subclass/group covers:

Synchronised presentation of the multimedia content according to the time stamps. Additional data can be synchronized to the main content. Also locking items at given times.

Example(s) of documents found in this subgroup: WO 2007/005268 A2

H04N 21/431

Generation of visual interfaces [N: for content selection or interaction]; Content or additional data rendering (receiver circuitry for displaying additional information H04N 5/445; interaction techniques for graphical user interfaces

G06F 3/048)

Definition statement

This subclass/group covers:

Details of the generation of visual interfaces on a video client, involving graphical features, screen space management. They must be differentiated from applications making use of them such as EPG

Example(s) of documents found in this subgroup: US 2008/0062894 A1

References relevant to classification in this group

This subclass/group does not cover:

Interaction techniques for graphical user interfaces	G06F 3/048
End-user applications using user interfaces	H04N 21/47

H04N 21/4312

[N: involving specific graphical features, e.g. screen layout, special fonts or colors, blinking icons, highlights or animations]

Definition statement

This subclass/group covers:

Layout arrangement on the screen, overlays, menus in general

Example(s) of documents found in this subgroup: US 2002/0184047 A1

H04N 21/4314

[N: for fitting data in a restricted space on the screen, e.g. EPG data in a rectangular grid]

Definition statement

This subclass/group covers:

Creation of a grid for e.g. an EPG application, where all the textual information is fitted, e.g. in a rectangular grid.

Example(s) of documents found in this subgroup: WO 2008/078094 A2

H04N 21/4316

[N: for displaying supplemental content in a region of the screen, e.g. an advertisement in a separate window]

Definition statement

This subclass/group covers:

A separate window or region is provided to display additional data, like a commercial or additional text

Example(s) of documents found in this subgroup: US 2008/0124057 A1

H04N 21/4318

[N: by altering the content in the rendering process, e.g. blanking, blurring or masking an image region (image enhancement or restoration in general G06T 5/00)]

Definition statement

This subclass/group covers:

- The displayed image can be altered according to certain parameters provided for example by an access control or censoring system. The image can be totally blanked or blurred or a region can be masked.
- Only details of the filtering action.
- Damping of brightness.

Example(s) of documents found in this subgroup: US 2003/0222994 A1

References relevant to classification in this group

This subclass/group does not cover:

Image enhancement or restoration in general	G06T 5/00
High-level filtering performed on a region of the image	H04N 21/45455

H04N 21/432

[N: Content retrieval operation from a local storage medium, e.g. hard-disk (details of retrieval of video data and associated meta data in video databases G06F17/30M5)]

Definition statement

This subclass/group covers:

Retrieval from local storage.

Example(s) of documents found in this subgroup: EP 1 796 374 A1

References relevant to classification in this group

This subclass/group does not cover:

Details of retrieval of video data and associated meta data in video databases	**G06F17/30M5**

H04N 21/4325

[N: by playing back content from the storage medium (reproduction of recorded television signals H04N 5/76; reproduction of recorded television signals H04N 9/79)]

Definition statement

This subclass/group covers:

Playback of media data from fixed or removable local storage devices.

Example(s) of documents found in this subgroup: EP 1 968 318 A1

References relevant to classification in this group

This subclass/group does not cover:

Reproduction of recorded television signals	H04N 5/76
Reproduction of recorded television signals	H04N 9/79

H04N 21/433

[N: Content storage operation, e.g. storage operation in response to a pause request, caching operations]

Definition statement

This subclass/group covers:

Local storage. The client uses part of his volatile or non volatile memory (e.g. hard disk) to store a part of the received multimedia data or data it has generated itself (e.g. monitored data).

Example(s) of documents found in this subgroup: EP 1 848 214 A1

H04N 21/4331

[N: Caching operations, e.g. of an advertisement for later insertion during playback]

Definition statement

This subclass/group covers:

Caching operations, for example of commercials for later insertion or the generation of an internal database, for example for holding EPG data. The storage has a temporary aspect and must be distinguished from recording, which aims more at a long term archiving on request of the user. It is not meant either to describe buffering as performed in the video decoder, which holds the multimedia data for a brief period of time. Caching is an action, which is transparent to the end-user unlike recording.

Example(s) of documents found in this subgroup: EP 1 331 810 A1

H04N 21/4332

[N: by placing content in organized collections, e.g. local EPG data repository (interfaces, Database management systems or updating for information retrieval G06F 17/30002; details of retrieval of video data and associated meta data in video database G06F17/30M5)]

Definition statement

This subclass/group covers:

Particular details of the use of a local database. Also generation of directory structure, within the file system of the client device.

Example(s) of documents found in this subgroup: US 2008/0288988 A1

References relevant to classification in this group

This subclass/group does not cover:

Interfaces, Database management systems or updating for information retrieval	G06F 17/30002
Details of retrieval of video data and associated meta data in video database	**G06F17/30M5**

H04N 21/4333

[N: Processing operations in response to a pause request]

Definition statement

This subclass/group covers:

The incoming video stream (e.g. from live broadcast) can be paused. It is stored locally to allow the user to resume viewing later on.

Example(s) of documents found in this subgroup: EP 1 269 752 B1

H04N 21/4334

[N: Recording operations (recording of a television signal H04N 5/76; arrangements for recording or accumulating broadcast information or broadcast-related information H04H 60/27)]

Definition statement

This subclass/group covers:

The received data is recorded for archiving purposes. This should be distinguished from caching, which has a temporary aspect.

Example(s) of documents found in this subgroup: WO 2006/129818 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for recording or accumulating broadcast information or broadcast-related information	H04H 60/27

H04N 21/4335

[N: Housekeeping operations, e.g. prioritizing content for deletion because of storage space restrictions (storage management, e.g. defragmentation G06F3/06M; unloading stored programs G06F 9/445; storage management in file systems G06F 17/30067; buffering arrangements in a network node or in an end terminal in packet networks H04L12/56Q1)]

Definition statement

This subclass/group covers:

The client device has a limited memory. Algorithms, describing which data are prioritized for deletion (e.g. oldest or less used data) are classified here.

Example(s) of documents found in this subgroup: US 2005/0193414 A1

References relevant to classification in this group

This subclass/group does not cover:

Storage management, e.g. defragmentation	**G06F3/06M**
Unloading stored programs	G06F 9/445
Storage management in file systems	G06F 17/30067
Buffering arrangements in a network node or in an end terminal in packet networks	**H04L12/56Q1**

H04N 21/434

Disassembling of a multiplex stream, e.g. demultiplexing audio and video streams, extraction of additional data from a video stream; Remultiplexing of multiplex streams; Extraction or processing of SI; Disassembling of packetized elementary stream [N: (demultiplexing of data packets for data networks, e.g. RTP/UDP H04L 65/00; stereoscopic image multiplexing or transmission H04N 13/0003)]

Definition statement

This subclass/group covers:

Transport stream demultiplexing It takes as input transport streams and generates after demultiplexing A/V streams or remultiplexes several TS into a new transport stream. Demultiplexing includes PID filtering.

Example(s) of documents found in this subgroup: EP 1 965 591 A1

References relevant to classification in this group

This subclass/group does not cover:

Demultiplexing of data packets for data networks, e.g. RTP/UDP	H04L 29/06176

H04N 21/4341

[N: Demultiplexing of audio and video streams]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: EP 0 776 134 A2

H04N 21/4342

[N: Demultiplexing isochronously with video sync, e.g. according to bit-parallel or bit-serial interface formats, as SDI]

Definition statement

This subclass/group covers:

Isochronously with the horizontal video sync, according to bit-parallel or bit-serial interface formats.

Example(s) of documents found in this subgroup: EP 0 777 383 A1

H04N 21/4344

[N: Remultiplexing of multiplex streams, e.g. by modifying time stamps or remapping the packet identifiers]

Definition statement

This subclass/group covers:

Modification of bitstream parameters, e.g. restamping, transmultiplexing, remapping of PIDs.

Example(s) of documents found in this subgroup: EP 0 917 355 A1

H04N 21/4345

[N: Extraction or processing of SI, e.g. extracting service information from an MPEG stream]

Definition statement

This subclass/group covers:

Retrieval of the system informations (SI).

Example(s) of documents found in this subgroup: WO 2008/108570 A1, US 2005/0060758 A1

H04N 21/4346

[N: involving stuffing data, e.g. packets or bytes (synchronisation arrangements in time-division multiplex systems with different or fluctuating information rates H04J3/07B)]

Definition statement

This subclass/group covers:

Extraction of the software or additional data that have been inserted in the packetised stream by replacement of (or by using the bandwidth occupied by) the stuffing bits/bytes/packets.

Example(s) of documents found in this subgroup: EP 1 555 826 A1

References relevant to classification in this group

This subclass/group does not cover:

Synchronisation arrangements in time-division multiplex systems with different or fluctuating information rates	**H04J3/07B**

H04N 21/4347

[N: Demultiplexing of several video streams]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: US 2003/0026423 A1

H04N 21/4348

[N: Demultiplexing of additional data and video streams]

Definition statement

This subclass/group covers:

Extraction of the additional data from a digital video stream.

Example(s) of documents found in this subgroup: WO 03/088645 A1

H04N 21/4349

[N: by extracting from data carousels, e.g. extraction of software modules from a DVB carousel]

Definition statement

This subclass/group covers:

Extraction process of the data out of the DVB carousel.

Example(s) of documents found in this subgroup: WO 2004/082289 A1

H04N 21/435

[N: Processing of additional data, e.g. decrypting of additional data, reconstructing software from modules extracted from the transport stream]

Definition statement

This subclass/group covers:

Software, additional data and generally speaking to non-streaming data. This part is dedicated to the retrieval of software modules and non audio-video information, such as additional data (descriptors, WWW pages,..)for example by extracting them from a DVB carousel or received from an internet site. Modules are reordered according to a directory module, checked for consistency and eventually the complete package is rebuilt.

H04N 21/4351

[N: involving reassembling additional data, e.g. rebuilding an executable program from recovered modules]

Definition statement

This subclass/group covers:

After recovery, all modules are ordered and the initial package rebuilt.

Example(s) of documents found in this subgroup:
WO9962248,WO2004082289,WO 2008/143447 A1

H04N 21/4353

[N: involving decryption of additional data (arrangements using cryptography for the use of broadcast information or broadcast related information H04H 60/23)]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: WO 2005/013126 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements using cryptography for the use of broadcast information or broadcast-related information	H04H 60/23

H04N 21/4355

[N: involving reformatting operations of additional data, e.g. HTML pages on a television screen (optimising the visualization of content for information retrieval from the Internet G06F 17/30905; adaptation of message content in packet-switching networks H04L 12/5835; Media manipulation, adaptation or conversion at the destination in one way streaming for real-time multimedia communications H04L 29/06496)]

Definition statement

This subclass/group covers:

Additional informations such as an HTML page are reformatted by the client device.

Example(s) of documents found in this subgroup: WO 2007/142648 A1

References relevant to classification in this group

This subclass/group does not cover:

Optimising the visualization of content for information retrieval from the Internet	G06F 17/30905
Adaptation of message content in packet-switching networks	H04L 12/5835
Media manipulation, adaptation or conversion at the destination in one way streaming for real-time multimedia communications	H04L 29/06496

H04N 21/4356

[N: by altering the spatial resolution e.g. to reformat additional data on a handheld device, attached to the STB]

Definition statement

This subclass/group covers:

The resolution of the additional informations is modified. It can be used, e.g. to reformat additional data on a handheld device, attached to the STB.

Example(s) of documents found in this subgroup: US 2008/0148314 A1

H04N 21/4358

[N: for generating different versions, e.g. for different peripheral devices]

Definition statement

This subclass/group covers:

The client device generates at least one other version of the original additional data, which is available together with the orginal version.

Example(s) of documents found in this subgroup: WO 2004/008739 A1

H04N 21/436

Interfacing a local distribution network, e.g. communicating with another STB, inside the home [N: Interfacing an external card to be used in combination with the client device] (arrangements specially adapted plural spots in a confined site in broadcast systems H04H 20/63)

Definition statement

This subclass/group covers:

- A series of interfaces allowing to communicate with cards and peripheral devices. It includes for example the DVB common interface, secure local communication, e.g. with a smart card or a video recorder, Firewire (IEEE 1394) connection to other video devices.
- Communication aspects with these devices when the client becomes a home server.

Example(s) of documents found in this subgroup: US 2007/0124766 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements specially adapted plural spots in a confined site in broadcast systems	H04H 20/63

H04N 21/43607

[N: Interfacing a plurality of external cards, e.g. through a DVB Common Interface [DVB-CI]]

Definition statement

This subclass/group covers:

Connection via common interface (DVB-CI), multiple conditional access.

Example(s) of documents found in this subgroup: EP 1 921 857 A2

H04N 21/43615

[N: Interfacing a Home Network, e.g. for connecting the client to a plurality of peripherals (home Audio Video Interoperability (HAVI) data switching networks H04L 12/2805)]

Definition statement

This subclass/group covers:

- Several peripherals connected to a home network.
- Documents describing communication aspects on the home network or describing a home network with no special emphasis on the connected peripheral devices.

Example(s) of documents found in this subgroup: WO 2007/097563 A1

References relevant to classification in this group

This subclass/group does not cover:

Home Audio Video Interoperability (HAVI) data switching networks	H04L 12/2805

H04N 21/43622

[N: Interfacing an external recording device]

Definition statement

This subclass/group covers:

Communication between the client and an external connected recording device.

Example(s) of documents found in this subgroup: EP 1 950 966 A1

H04N 21/4363

Adapting the video [N: or multiplex]stream to a specific local network, e.g. a IEEE 1394 or Bluetooth network

Definition statement

This subclass/group covers:

Adaptation of the bitstream to the local network: e.g. transport of video over

firewire.

Example(s) of documents found in this subgroup: US 2008/0007616 A1

H04N 21/43632

[N: involving a wired protocol, e.g. IEEE 1394 (high-speed IEEE 1394 serial bus H04L 12/40052)]

Definition statement

This subclass/group covers:

Devices and peripherals connected via a firewire (IEEE1394) link.

Example(s) of documents found in this subgroup: US 2008/0007616 A1

References relevant to classification in this group

This subclass/group does not cover:

High-speed IEEE 1394 serial bus	H04L 12/40052

H04N 21/43635

[N: HDMI]

Definition statement

This subclass/group covers:

Devices and peripherals connected via an HDMI connection.

H04N 21/43637

[N: involving a wireless protocol, e.g. Bluetooth or wireless LAN (IEEE 802.11; arrangements for wireless networking or broadcasting of information in indoor or near-field type systems H04B10/10N3; wireless local area data switching networks H04L12/28W; flow control in wireless networks H04W 28/10)]

Definition statement

This subclass/group covers:

Device and peripherals connected via a wireless link, such as Bluetooth or wireless LAN (IEEE 802.11).

Example(s) of documents found in this subgroup: US 2008/0273118 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for wireless networking or broadcasting of information in indoor or near-field type systems	**H04B10/10N3**
Wireless local area data switching networks	**H04L12/28W**
Flow control in wireless networks	H04W 28/10

H04N 21/4367

[N: Establishing a secure communication between the client and a peripheral device or smart card (arrangements for secret or secure communication H04L 9/00; security arrangements for protecting computers or computer systems against unauthorised activity G06F 21/00; security arrangements in wireless networks H04W 12/00)]

Definition statement

This subclass/group covers:

Secure communication with the peripheral or with a smart card.

Example(s) of documents found in this subgroup: EP 1 990 999 A2

References relevant to classification in this group

This subclass/group does not cover:

Security arrangements in wireless networks	H04W 12/00

H04N 21/437

[N: Interfacing the upstream path of the transmission network, e.g. for transmitting client requests to a VOD server (flow control in data networks H04L 12/569; formation of RTP packets H04L 29/06176; application layer Quality of Service and content dependent routing of client requests H04L 29/08945)]

Definition statement

This subclass/group covers:

Non physical details of phone or cable modems. Communication aspects with the server are to be found elsewhere.

Example(s) of documents found in this subgroup: WO 03/007611 A1

References relevant to classification in this group

This subclass/group does not cover:

Flow control in data networks	H04L 12/569
Formation of RTP packets	H04L 29/06176
Application layer Quality of Service and content dependent routing of client requests	H04L 29/08945

H04N 21/438

[N: Interfacing the downstream path of the transmission network originating from a server, e.g. retrieving MPEG packets from an IP network (transmission of MPEG streams over ATM H04L 12/5601; flow control in datat networks H04L 12/569; processing of real-time packets H04L 29/06176)]

Definition statement

This subclass/group covers:

The Downstream network interface processes the electromagnetic waves received from the network and outputs multimedia streams. It comprises channel tuning to get the baseband signal, channel decoding, descrambling.

Example(s) of documents found in this subgroup: WO 02/069581 A1, US 2007/0006259

References relevant to classification in this group

This subclass/group does not cover:

Transmission of MPEG streams over ATM	H04L 12/5601
Flow control in data networks	H04L 12/569
Processing of real-time packets	H04L 29/06176

H04N 21/4381

[N: Recovering the multiplex stream from a specific network, e.g. recovering MPEG packets from ATM cells (transmission

of MPEG streams over ATM H04L 12/5601)]

Definition statement

This subclass/group covers:

The bitstream is adapted to a specific network. The type of network or protocol used is classified elsewhere.

Example(s) of documents found in this subgroup: US 2004/0210939 A1

References relevant to classification in this group

This subclass/group does not cover:

Transmission of MPEG streams over ATM	H04L 12/5601

H04N 21/4382

[N: Demodulation or channel decoding, e.g. QPSK demodulation (analog front ends or means for connecting modulators, demodulators or transceivers to a transmission line H04L 27/0002)]

Definition statement

This subclass/group covers:

Demodulation and error correction.

Example(s) of documents found in this subgroup: WO 2006/006833 A1

References relevant to classification in this group

This subclass/group does not cover:

Analog front ends or means for connecting modulators, demodulators or transceivers to a transmission line	H04L 27/0002

H04N 21/4383

[N: Accessing a communication channel, e.g. channel tuning (Tuning indicators; Automatic tuning control H04N 5/50)]

Definition statement

This subclass/group covers:

Channel selection.

Example(s) of documents found in this subgroup: WO 2006/130116 A1

H04N 21/4384

[N: involving operations to reduce the access time, e.g. fast-tuning for reducing channel switching latency]

Definition statement

This subclass/group covers:

Fast channel change or rapid tuning relate to techniques, where the STB tries to display as quick as possible an image in the time interval starting after the user has issued a channel change command and before the decoding buffer could be filled. Those techniques comprise for example, decoding a low resolution stream, or a stream sent a higher rate,..

Example(s) of documents found in this subgroup: WO 2006/121801 A1

H04N 21/4385

[N: Multiplex stream processing, e.g. multiplex stream decrypting]

Definition statement

This subclass/group covers:

Processing of the transport stream as received from the network and before being sent to the demultiplexer.

Example(s) of documents found in this subgroup: EP 2 023 497 A1

H04N 21/43853

[N: involving multiplex stream decryption (arrangements using cryptography for the use of broadcast information or broadcast-related information H04H 60/23)]

Definition statement

This subclass/group covers:

Only the descrambling/decrypting of the transport stream.

Example(s) of documents found in this subgroup: US 2006/0269063 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements using cryptography for the use of broadcast information or broadcast-related information	H04H 60/23
Multiplex stream encryption	H04N 21/23895
Video stream decryption	H04N 21/4405

H04N 21/43856

[N: by partial decryption, e.g. decrypting a multiplex stream that has been partially encrypted]

Definition statement

This subclass/group covers:
Example(s) of documents found in this subgroup: WO 2007/011766 A1

H04N 21/439

[N: Processing of audio elementary streams]

Definition statement

This subclass/group covers:
Audio stream management.

H04N 21/4392

[N: involving audio buffer management]

Definition statement

This subclass/group covers:
Buffering of the audio signal.

Example(s) of documents found in this subgroup: WO 2007/031918 A2

H04N 21/4394

[N: involving operations for analysing the audio stream, e.g. detecting features or characteristics in audio streams (arrangements characterised by components specially adapted for monitoring, identification or recognition of audio in broadcast systems H04H 60/58)]

Definition statement

This subclass/group covers:

The audio stream is parsed to extract or recognize some features or to detect embedded triggers.

Example(s) of documents found in this subgroup: US 2007/0209055 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements characterised by components specially adapted for monitoring, identification or recognition of audio in broadcast systems	H04H 60/58

H04N 21/4396

[N: by muting the audio signal]

Definition statement

This subclass/group covers:

The audio stream is muted because, for example, rights have been violated or for censoring purposes.

Example(s) of documents found in this subgroup: US 2005/0278732 A2

H04N 21/4398

[N: involving reformatting operations of audio signals (details of audio signal transcoding G10L19/14T)]

Definition statement

This subclass/group covers:

Reformatted audio stream, e.g. by converting from one coding standard to another.

Example(s) of documents found in this subgroup: EP 1 775 959 A2

References relevant to classification in this group

This subclass/group does not cover:

Details of audio signal transcoding	**G10L19/14T**

H04N 21/44

[N: Processing of video elementary streams, e.g. splicing a video clip retrieved from local storage with an incoming video stream, rendering scenes according to MPEG-4 scene graphs]

Definition statement

This subclass/group covers:

- Video stream management. Receives the video stream from the demultiplexer and performs MPEG decoding, synchronization with other streams.
- Management of the video decoder buffer.

H04N 21/44004

[N: involving video buffer management, e.g. video decoder buffer or video display buffer]

Definition statement

This subclass/group covers:

Buffer level control.

Example(s) of documents found in this subgroup: EP 1 107 601 A2

H04N 21/44008

[N: involving operations for analysing video streams, e.g. detecting features or characteristics in the video stream (arrangements characterised by components specially adapted for monitoring, identification or recognition of video in broadcast systems H04H 60/59)]

Definition statement

This subclass/group covers:

Detection of features (e.g. logo) in a video stream, extraction of characteristics or generation of metadata in the client directly from the video stream.

Example(s) of documents found in this subgroup: GB 2447876 A

References relevant to classification in this group

This subclass/group does not cover:

Arrangements characterised by components specially adapted for monitoring, identification or recognition of video in broadcast systems	H04H 60/59

H04N 21/44012

[N: involving rendering scenes according to scene graphs, e.g. MPEG-4 scene graphs]

Definition statement

This subclass/group covers:

- Spatial composition of a scene according to the scene graph in the rendering process. Scene graph updating following client/user control is covered here as well as the animation of objects.
- Specific to the processing of MPEG-4 objects.

Example(s) of documents found in this subgroup: EP 1 715 681 A2

H04N 21/44016

[N: involving splicing one content stream with another content stream, e.g. for substituting a video clip]

Definition statement

This subclass/group covers:

Splicing of at least one video stream with another stream (video or not) at the client level. It can be used for inserting or substituting a piece of video such as a commercial.

Example(s) of documents found in this subgroup: WO 2006/046212 A1

H04N 21/4402

[N: involving reformatting operations of video signals for household redistribution, storage or real-time display [N:(adapting incoming signals to the display format of the display terminal G09G 5/005; media manipulation, adaptation or conversion at the destination in one way streaming for real-time multimedia communications H04L 29/06496; details of conversion of video standards at pixel level H04N 7/01; video transcoding H04N 7/26941)]

Definition statement

This subclass/group covers:
Example(s) of documents found in this subgroup: WO 2004/008289 A2

References relevant to classification in this group

This subclass/group does not cover:

Adapting incoming signals to the display format of the display terminal	G09G 5/005
Media manipulation, adaptation or conversion at the destination in one way streaming for real-time multimedia communications	H04L 29/06496
Details of conversion of video standards at pixel level	H04N 7/01
Video transcoding	H04N 7/26941

H04N 21/440209

[N: for formatting on an optical medium, e.g. DVD]

Definition statement

This subclass/group covers:
The MPEG stream is preprocessed for formatting and recording on a DVD.

Example(s) of documents found in this subgroup: US 2003/0081778 A1

H04N 21/440218

[N: by transcoding between formats or standards, e.g. from MPEG-2 to MPEG-4 (conversion of standards in analogue television systems H04N 7/01)]

Definition statement

This subclass/group covers:
Transcoding between standards (e.g. MPEG-2 to MPEG-4).

Example(s) of documents found in this subgroup: EP 1 372 333 A2

H04N 21/440227

[N: by decomposing into layers, e.g. base layer and one or more enhancement layers]

Definition statement

This subclass/group covers:
The client device generates a layered video stream from the original one.

Example(s) of documents found in this subgroup: US 2006/0117371 A1

H04N 21/440236

[N: by media transcoding, e.g. video is transformed into a slideshow of still pictures, audio is converted into text]

Definition statement

This subclass/group covers:
Transcoding between modalities (e.g audio to text).

Example(s) of documents found in this subgroup: WO 03/049447

H04N 21/440245

[N: the reformatting operation being performed only on part of the stream, e.g. a region of the image or a time segment]

Definition statement

This subclass/group covers:
The reformatting operation is performed on part of the stream, the part being spatial region of the image or a time segment.

Example(s) of documents found in this subgroup: WO 2006/067731

H04N 21/440254

[N: by altering signal-to-noise parameters, e.g. requantization]

Definition statement

This subclass/group covers:
New quantization parameters are introduced allowing to change the resolution of each video frame.

Example(s) of documents found in this subgroup: US 6,441,754 B1

H04N 21/440263

[N: by altering the spatial resolution, e.g. for displaying on a connected PDA]

Definition statement

This subclass/group covers:

Client-side alteration of the spatial resolution, mainly for dispalying on peripheral device.

Example(s) of documents found in this subgroup: WO 2008/085874 A2

H04N 21/440272

[N: for performing aspect ratio conversion]

Definition statement

This subclass/group covers:

Conversion of signal for displaying with a different aspect ratio or with a different resolution.

Example(s) of documents found in this subgroup: WO 02/13507 A2

H04N 21/440281

[N: by altering the temporal resolution, e.g. by frame skipping (television signal recording using magnetic recording on tape for reproducing at a rate different from the recording rate H04N 5/783)]

Definition statement

This subclass/group covers:

Alteration of the frame rate.

Example(s) of documents found in this subgroup: EP 1 956 840 A1

References relevant to classification in this group

This subclass/group does not cover:

Television signal recording using magnetic recording on tape for reproducing at a rate different from the recording rate	H04N 5/783

H04N 21/44029

[N: for generating different versions]

Definition statement

This subclass/group covers:

The client device generates at least one other version of the original content, which is available together with the orginal version.

Example(s) of documents found in this subgroup: EP 1 901 293 A1

H04N 21/4405

[N: involving video stream decryption (arrangements for secret or secure communication H04L 9/00; arrangements using cryptography for the use of broadcast information or broadcast-related information H04H 60/23)]

Definition statement

This subclass/group covers:

Descrambling of the video stream, decryption of the content stream.

Example(s) of documents found in this subgroup: US 2005/0169466 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements using cryptography for the use of broadcast information or broadcast-related information	H04H 60/23

H04N 21/44055

[N: by partially decrypting, e.g. decrypting a video stream that has been partially encrypted]

Definition statement

This subclass/group covers:

Not all of the signal is scrambled or different parts are encrypted differently, e.g. to reduce processor load or to enable a reduced quality presentation.

Example(s) of documents found in this subgroup: WO 2009/021953 A1

H04N 21/4408

[N: involving video stream encryption, e.g. re-encrypting a decrypted video stream for redistribution in a home network (arrangements for secret or secure communication H04L 9/00;

arrangements using cryptography for the use of broadcast information or broadcast-related information H04H 60/23)]

Definition statement

This subclass/group covers:

The client device reencrypts the decrypted video stream, usually with another key. It can be used for secure recording.

Example(s) of documents found in this subgroup: EP 1 410 342 B1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements using cryptography for the use of broadcast information or broadcast-related information	H04H 60/23

H04N 21/441

[N: Acquiring end-user identification (authentication in wireless communication networks H04W 12/06) [N: e.g. using personal code sent by the remote control or by inserting a card] (restricting access to computer systems by authenticating users using a predetermined code G06F21/00N5A2)]

Definition statement

This subclass/group covers:

The user identification can be used to retrieve his settings, viewing preferences or in financial transactions. Monitoring of the user actions are to be classified elsewhere.

Example(s) of documents found in this subgroup: US 2007/0244665 A1, US 2007/0150832 A1

References relevant to classification in this group

This subclass/group does not cover:

Restricting access to computer systems by authenticating users using a predetermined code	**G06F21/00N5A2**

H04N 21/4415

[N: using biometric characteristics of the user, e.g. by voice recognition or fingerprint scanning (methods or arrangements for recognising patterns G06K 9/00; restricting access to computer systems by authenticating users using biometric data G06F21/00N5A2B; authentication mechanisms using biometrical features for network security H04L 29/06809; authentication in wireless network security H04W 12/06)]

Definition statement

This subclass/group covers:

The user is passively identified by facial/fingerprint/voice recognition. A corresponding symbol should be added to describe the type of sensor/input device used.

Example(s) of documents found in this subgroup: WO 2008/157684 A2

References relevant to classification in this group

This subclass/group does not cover:

Restricting access to computer systems by authenticating users using biometric data	**G06F21/00N5A2B**
Authentication mechanisms using biometrical features for network security	H04L 29/06809
Authentication in wireless network security	H04W 12/06

H04N 21/442

[N: Monitoring of processes or resources, e.g. detecting the failure of a recording device, monitoring the downstream bandwidth, the number of times a movie has been viewed, the storage space available from the internal hard disk (arrangements for monitoring broadcast services or broadcast-related services H04H 60/29; arrangements for identifying or recognising characteristics with a direct linkage to broadcast information H04H 60/35; monitoring of user activities for profile generation for accessing a video database G06F17/30M5; monitoring in wireless networks H04W 24/00)]

Definition statement

This subclass/group covers:

Monitoring is an internal process, which checks permanently user inputs, the bandwidth available at the different network interfaces or any internal processes. It can generate history data, which is later processed for example by a recommender system to build automatically a user profile (implicit profile). Since profiles can be also defined explicitely by the user via a menu, only the passive monitoring of user selections are to be classified here. Creation of explicit profiles is indexed elsewhere.

Example(s) of documents found in this subgroup: WO 2006/052711 A2

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for monitoring broadcast services or broadcast-related services	H04H 60/29
Arrangements for identifying or recognising characteristics with a direct linkage to broadcast information	H04H 60/35
Monitoring of user activities for profile generation for accessing a video database	**G06F17/30M5**
Monitoring in wireless networks	H04W 24/00

H04N 21/44204

[N: Monitoring of content usage, e.g. the number of times a movie has been viewed, copied or the amount which has been watched (monitoring of user activities for profile generation for accessing a video database G06F17/30M5; Protecting generic digital content where the protection is independent of the precise nature of the content G06F21/00N7D; arrangements for monitoring the use made of the broadcast services in broadcast systems H04H 60/31)]

Definition statement

This subclass/group covers:

The client keeps track of how often a piece of content has been viewed or copied or recorded. Covers also records of content ID, percentage of viewed/recorded program.

Example(s) of documents found in this subgroup: EP 1 737 236 A2

References relevant to classification in this group

This subclass/group does not cover:

Monitoring of user activities for profile generation for accessing a video database	**G06F17/30M5**
Protecting generic digital content where the protection is independent of the precise nature of the content	**G06F21/00N7D**
Arrangements for monitoring the use made of the broadcast services in broadcast systems	H04H 60/31

H04N 21/44209

[N: Monitoring of downstream path of the transmission network originating from a server, e.g. bandwidth variations of a wireless network (monitoring or testing of receivers in general by measuring channel quality parameters H04B 17/0042; arrangements for maintenance or administration in data switching networks involving bandwidth and capacity management H04L 12/2439)]

Definition statement

This subclass/group covers:

The connection to the server is monitored, for example availability, bandwidth.

Example(s) of documents found in this subgroup: US 2008/0104653 A1

References relevant to classification in this group

This subclass/group does not cover:

Monitoring or testing of receivers in general by measuring channel quality parameters	H04B 17/0042
Arrangements for maintenance or administration in data switching networks involving bandwidth and capacity management	H04L 12/2439

H04N 21/44213

[N: Monitoring of end-user related data (arrangements for monitoring the users' behaviour or opinions in broadcast systems H04H 60/33)]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: US 2004/0117815 A2

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for monitoring the users' behaviour or opinions in broadcast systems	H04H 60/33

H04N 21/44218

[N: Detecting physical presence or behaviour of the user, e.g. using sensors to detect if the user is leaving the room or changes his face expression during a TV program (methods or arrangements for acquiring or recognising human faces, facial parts, facial sketches, facial expressions G06K 9/00221; methods or arrangements for recognising movements or behaviour G06K 9/00335; methods or arrangements for recognising human body or animal bodies or body parts G06K 9/00362; arrangements for identifying users in broadcast systems H04H 60/45)]

Definition statement

This subclass/group covers:

Sensors are used to detect for example the presence of individuals in front of the TV set, as well as if somebody is entering or leaving the room. Also user reactions, like movements, face expression should be classified here.

Example(s) of documents found in this subgroup: WO 2007/146089 A2

References relevant to classification in this group

This subclass/group does not cover:

Methods or arrangements for acquiring or recognising human faces, facial parts, facial sketches, facial expressions	G06K 9/00221
Methods or arrangements for recognising movements or behaviour	G06K 9/00335
Methods or arrangements for recognising human body or animal bodies or body parts	G06K 9/00362
Arrangements for identifying users in broadcast systems	H04H 60/45

H04N 21/44222

[N: Monitoring of user selections, e.g. selection of programs, purchase activity (monitoring of user selections in data processing systems G06F 11/34; monitoring of user activities for profile generation for accessing a video database G06F17/30M5; tracking the activity of the end-user H04L 29/08675; arrangements for monitoring the user's behaviour or opinions in broadcast systems H04H 60/33)]

Definition statement

This subclass/group covers:

User selections using for example a remote control are monitored. It covers the selection of programs, duration of viewing, purchase activity, setting reminders answers to quiz, questionaires, advertisements. A log file is generated. Covers clickstream.

Example(s) of documents found in this subgroup: WO 2006/126988 A1

References relevant to classification in this group

This subclass/group does not cover:

Monitoring of user selections in data processing systems	G06F 11/34
Monitoring of user activities for profile generation for accessing a video database	**G06F17/30M5**
Tracking the activity of the end-user	H04L 29/08675
Arrangements for monitoring the user's behaviour or opinions in broadcast systems	H04H 60/33

H04N 21/44227

[N: Monitoring of local network, e.g. connection or bandwidth variations; Detecting new devices in the local network (configuring of peripheral devices in general G06F9/445B4; monitoring connectivity in data switched networks H04L 12/2639)]

Definition statement

This subclass/group covers:

The status of the connection or bandwidth variations on the local network are monitored. Also detection of new devices in the local network

Example(s) of documents found in this subgroup: WO 2007/093426 A2

References relevant to classification in this group

This subclass/group does not cover:

Configuring of peripheral devices in general	**G06F9/445B4**
Monitoring connectivity in data switched networks	H04L 12/2639

H04N 21/44231

[N: Monitoring of peripheral device or external card, e.g. to detect processing problems in a handheld device or the failure of an external recording device (configuring of peripheral devices in general G06F9/445B4; monitoring the status of connected device in data switched netwokrs H04L 12/2642; reporting information sensed by appliance or service execution status of appliance services in a home automation network H04L 12/2823)]

Definition statement

This subclass/group covers:

The status of the connected peripheral devices is monitored, e.g. to detect the failure of a VCR or the hard disk problem of an external storage device.

Example(s) of documents found in this subgroup: US 7,035,363 B1

References relevant to classification in this group

This subclass/group does not cover:

Configuring of peripheral devices in general	**G06F9/445B4**
Monitoring the status of connected device in data switched networks	H04L 12/2642
Reporting information sensed by appliance or service execution status of appliance services in a home automation network	H04L 12/2823

H04N 21/44236

[N: Monitoring of piracy processes or activities (protecting computer platforms against harmful, malicious or unexpected

behaviour or activities using intrusion detection and counter measures G06F21/00N3J; computer virus detection and handling G06F21/00N3V)]

References relevant to classification in this group

This subclass/group does not cover:

Protecting computer platforms against harmful, malicious or unexpected behaviour or activities using intrusion detection and counter measures	**G06F21/00N3J**
Computer virus detection and handling	**G06F21/00N3V**

H04N 21/4424

[N: Monitoring of the internal components or processes of the client device, e.g. CPU or memory load, processing speed, timer, counter or percentage of the hard disk space used (error monitoring in general G06F 11/30; monitoring or testing of receivers in general with feedback of measurements to the transmitter H04B 17/0067; arrangements for monitoring conditions of receiving stations in broadcast systems H04H 60/32; diagnosis, testing or measuring for television receivers H04N 17/04)]

Definition statement

This subclass/group covers:

- The client monitors if all its components, internal processes are running properly and reports possible troubles.
- CPU and memory load, processing speed, buffer (other than decoder buffer), timer, counter, percentage of the hard disk space used, authentication of internal components.

Example(s) of documents found in this subgroup: US2009244290, EP2043373, EP1722 555A1

References relevant to classification in this group

This subclass/group does not cover:

Error monitoring in general	G06F 11/30
Monitoring or testing of receivers in general with feedback of measurements to the transmitter	H04B 17/0067

Arrangements for monitoring conditions of receiving stations in broadcast systems	H04H 60/32
Diagnosis, testing or measuring for television receivers	H04N 17/04

H04N 21/44245

[N: Monitoring the upstream path of the transmission network, e.g. its availability, bandwidth (monitoring or testing of receivers in general by measuring channel quality parameters H04B 17/0042)]

Definition statement

This subclass/group covers:

Monitoring of the upstream connection, e.g. its availability, bandwidth,..

Example(s) of documents found in this subgroup: WO 2005/053303 A2

References relevant to classification in this group

This subclass/group does not cover:

Monitoring or testing of receivers in general by measuring channel quality parameters	H04B 17/0042

H04N 21/4425

[N: Monitoring of client processing errors or hardware failure (monitoring in electrical digital data processing G06F 11/00; error detection in general G06F 11/07; monitoring in general G06F 11/30)]

Definition statement

This subclass/group covers:

Monitoring of errors related e.g. to content uploading, demultiplexing or due to hardware failure.

Example(s) of documents found in this subgroup: EP2086234, US2010031307, WO2004/114583 A3

References relevant to classification in this group

This subclass/group does not cover:

Error detection in general	G06F 11/07
Monitoring in general	G06F 11/30

H04N 21/443

[N: OS processes, e.g. booting a STB, implementing a Java virtual machine in a STB, power management in a STB (arrangements for program loading or initiating G06F 9/445; boot device selection; loading of operating system G06F9/445B6; program loading or initiating in general using non-volatile memory from which the program can be directly executed G06F9/445E)]

Definition statement

This subclass/group covers:

- Operating system aspects.
- Basic functions provided by the operating system like memory management, event handling or details of dedicated software libraries.

Example(s) of documents found in this subgroup: WO 2008/100092 A1

References relevant to classification in this group

This subclass/group does not cover:

Boot device selection; Loading of operating system	**G06F9/445B6**
Program loading or initiating in general using non-volatile memory from which the program can be directly executed	**G06F9/445E**

H04N 21/4431

[N: characterized by the use of Application Program Interface [API] libraries]

Definition statement

This subclass/group covers:

Details of dedicated software libraries or APIs.

Example(s) of documents found in this subgroup: EP 1 890 492 A2

H04N 21/4432

[N: Powering on the client, e.g. bootstrap loading using setup parameters being stored locally or received from the server (resetting in general G06F 1/14; program loading or initiating in general G06F 9/445; bootstrapping in general G06F9/445B; secure boots of computer platforms G06F21/00N3P2)]

Definition statement

This subclass/group covers:

Setup parameters can be stored locally or received from the server.

Describes the action of powering on or booting the client device.

Example(s) of documents found in this subgroup: EP 1 942 658 A2

References relevant to classification in this group

This subclass/group does not cover:

Resetting in general	G06F 1/14
Program loading or initiating in general	G06F 9/445
Bootstrapping in general	**G06F9/445B**
Secure boots of computer platforms	**G06F21/00N3P2**

H04N 21/4433

[N: Implementing client middleware, e.g. Multimedia Home Platform [MHP]]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: XP/002416424

H04N 21/4435

[N: Memory management (allocation of memory to service a request G06F 9/5016; addressing or allocating within memory systems or architectures G06F 12/02)]

Definition statement

This subclass/group covers:

Details of memory access. Pertains only to the RAM and not the hard disk.

Example(s) of documents found in this subgroup: EP 1 739 672 A1

References relevant to classification in this group

This subclass/group does not cover:

Allocation of memory to service a request	G06F 9/5016
Addressing or allocating within memory systems or architectures	G06F 12/02

H04N 21/4436

[N: Power management, e.g. shutting down unused components of the receiver (power management in computer systems G06F 1/3203; Hibernate or awake process in computer systems G06F9/445B7)]

Definition statement

This subclass/group covers:

Battery power management of the receiver (e.g. DVB-H, stand-by mode, shutting down unused parts of the receiver)

Example(s) of documents found in this subgroup: EP 1 814 280 A2

References relevant to classification in this group

This subclass/group does not cover:

Power management in computer systems	G06F 1/3203
Hibernate or awake process in computer systems	**G06F9/445B7**

H04N 21/4437

[N: Implementing a Virtual Machine [VM] (virtual machines in general G06F 9/45533)]

Definition statement

This subclass/group covers:

Presence or details of the implementation of a virtual machine.

Example(s) of documents found in this subgroup: US 2007/0283391 A1

References relevant to classification in this group

This subclass/group does not cover:

Virtual machines in general	G06F 9/45533

H04N 21/4438

[N: Window management, e.g. event handling following interaction with the user interface]

Definition statement

This subclass/group covers:

- A window manager represents a technical evolution with respect to older techniques of displaying non video data on a screen such as PiP or OSD.
- The creation, management of windows or drawing primitives and generally speaking the management of the interaction with a GUI including event handling.

Example(s) of documents found in this subgroup: US 2008/0150964 A1

H04N 21/45

[N: Management operations performed by the client for facilitating the reception of or the interaction with the content or administrating data related to the end-user or to the client device itself, e.g. learning user preferences for recommending movies, resolving scheduling conflicts]

Definition statement

This subclass/group covers:

System management. This layer describes high-level functions of the multimedia client, but which are still transparent for the end-user.

H04N 21/4508

[N: Management of client or end-user data]

Definition statement

This subclass/group covers:

Management functions implemented in the client device.

Example(s) of documents found in this subgroup: US 2008/0205857 A1

H04N 21/4516

[N: involving client characteristics, e.g. Set-Top-Box type, software version, amount of memory available (allocation of resources considering software capabilities G06F 9/5055; Allocation of resources considering hardware capabilities G06F 9/5044; message adaptation based on network or terminal capabilities in packet switching networks H04L 12/5825; protocols involving terminal profiles for network applications in communication control or processing H04L 29/08927; processing of terminal status or physical abilities in wireless networks H04W 8/22)]

Definition statement

This subclass/group covers:

The hardware profile describing the processing capabilities of the client is used to discard data streams, which the client can not handle and to retrieve software modules or streams compatible with its capabilities.

It covers hardware and software resources, like the version of the software installed.

Example(s) of documents found in this subgroup: US 2008/0148314 A1

References relevant to classification in this group

This subclass/group does not cover:

Allocation of resources considering software capabilities	G06F 9/5055
Allocation of resources considering hardware capabilities	G06F 9/5044
Message adaptation based on network or terminal capabilities in packet switching networks	H04L 12/5825
Protocols involving terminal profiles for network applications in communication control or processing	H04L 29/08927
Processing of terminal status or physical abilities in wireless networks	H04W 8/22

H04N 21/4524

[N: involving the geographical location of the client (retrieval from the Internet by querying based on geographical locations G06F 17/3087; Systems specially adapted for using geographical information in broadcast systems H04H 60/70; protocols in which the network application is adapted for the location of the user terminal in communication control or processing H04L 29/08657; services making use of the location of users or terminals in wireless networks H04W 4/02; Locating users or terminals in wireless networks H04W 64/00)]

Definition statement

This subclass/group covers:

The geographical position of the client, which can be a regional or ZIP code for a fixed client or data provided by a GPS for a mobile client is used to provide the user with information related to its geographical environment (regional news or ads).

Example(s) of documents found in this subgroup: US 6,948,183 B1

References relevant to classification in this group

This subclass/group does not cover:

Retrieval from the Internet by querying based on geographical locations	G06F 17/3087
Systems specially adapted for using geographical information in broadcast systems	H04H 60/70
Protocols in which the network application is adapted for the location of the user terminal in communication control or processing	H04L 29/08657
Services making use of the location of users or terminals in wireless networks	H04W 4/02
Locating users or terminals in wireless networks	H04W 64/00

H04N 21/4532

[N: involving end-user characteristics, e.g. viewer profile, preferences (monitoring of user activities for profile generation for accessing a video database G06F17/30M5; protocols involving user profiles for network applications in

communication control or processing H04L 29/08936; processing of user preferences or user profiles in wireless networks H04W 8/18)]

Definition statement

This subclass/group covers:

The viewer profile is either compiled from history data or defined explicitely by the user or received from the server as demographic data.

Example(s) of documents found in this subgroup: WO 2006/1296988 A1

References relevant to classification in this group

This subclass/group does not cover:

Monitoring of user activities for profile generation for accessing a video database	**G06F17/30M5**
Protocols involving user profiles for network applications in communication control or processing	H04L 29/08936
Processing of user preferences or user profiles in wireless networks	H04W 8/18

H04N 21/454

[N: Content or additional data filtering, e.g. blocking advertisements (filtering and selective blocking of messages over packet-switching networks H04L 12/585)]

Definition statement

This subclass/group covers:

The server sends the same content to a plurality of clients as it does not have any prior knowledge of their requirements. The filtering module will extract the part relevant to the client according to criteria.Advanced filtering systems use learning algorithms to adapt the criteria according to explicit user inputs and/or monitored data. Details of image filtering are described elsewhere.

References relevant to classification in this group

This subclass/group does not cover:

Filtering and selective blocking of messages over packet-switching networks	H04L 12/585

H04N 21/4542

[N: Blocking scenes or portions of the received content, e.g. censoring scenes]

Definition statement

This subclass/group covers:

Usually the filter will extract a small portion of the data from the incoming stream. As this operation is trivial, it does not need to be described. However, some applications consider removing a small part of the information from the incoming stream. Examples can be censoring of scenes, image regions or blocking of advertisements.

Example(s) of documents found in this subgroup: WO 2007/051956 A1

H04N 21/4545

Input to filtering algorithms, e.g. filtering a region of the image [N: (filtering for image enhancement or restoration G06T 5/00)]

Definition statement

This subclass/group covers:

Once the filtering criterion is defined, the filter needs to know on which kind of streaming or additional data it has to apply.

Example(s) of documents found in this subgroup: US 2002/0108128 A1

References relevant to classification in this group

This subclass/group does not cover:

Filtering for image enhancement or restoration	G06T 5/00

H04N 21/45452

[N: applied to an object-based stream, e.g. MPEG-4 streams]

Definition statement

This subclass/group covers:

The filter could process MPEG-4 streams, for example to delete some objects.

Example(s) of documents found in this subgroup: US 2003/0219708 A1

H04N 21/45455

[N: applied to a region of the image]

Definition statement

This subclass/group covers:

A Region Of Interest is defined and displayed, blurred or masked. This can be applied to analog or MPEG-2 streams, where the image has been encoded as a whole and not as a set of objects. Therefore, the region is marked and tracked. Censoring systems can require to mask or blur some regions of the image.

Example(s) of documents found in this subgroup: US 2007/0162922 A1

H04N 21/45457

[N: applied to a time segment]

Definition statement

This subclass/group covers:

A time segment of the video is filtered out.

Example(s) of documents found in this subgroup: WO 00/31973

H04N 21/458

[N: Scheduling content for creating a personalized stream, e.g. by combining a locally stored advertisement with an incoming stream; Updating operations, e.g. for OS modules [N: time-related management operations] (arrangements for replacing or switching information during the broadcast or during the distribution H04H 20/10)]

Definition statement

This subclass/group covers:

The scheduler has a similar function to the scheduler on the server side. It processes incoming streams of data as well as data cached on an internal disk and creates virtual channels. It can also be controlled by the server. It can generate a stream of personalized content.

Example(s) of documents found in this subgroup: WO 2007/072368 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for replacing or switching information during the broadcast or during the distribution	H04H 20/10

H04N 21/4583

[N: Automatically resolving scheduling conflicts, e.g. when a recording by reservation has been programmed for two programs in the same time slot]

Definition statement

This subclass/group covers:

The client solves automatically conflicts in scheduling issues, like having to perform 2 operations at the same time (e.g.recording 2 different movies in the same time slot)

Example(s) of documents found in this subgroup: WO 2006/127211 A2

H04N 21/4586

[N: Content update operation triggered locally, e.g. by comparing the version of software modules in a DVB carousel to the version stored locally (deployment, distribution, installation, update of software G06F9/445N; program updating while running in general G06F9/445R; error detection or correction of the data by redundancy during software upgrading G06F 11/1433; arrangements for updating broadcast information or broadcast-related information H04H 60/25)]

Definition statement

This subclass/group covers:

The client checks itself if an update operation needs to be performed. This could be implemented by comparing the version of software modules in a DVB carousel with the local version.

Example(s) of documents found in this subgroup: US 005666293A

References relevant to classification in this group

This subclass/group does not cover:

Deployment, distribution, installation, update of software	**G06F9/445N**

Program updating while running in general	**G06F9/445R**
Error detection or correction of the data by redundancy during software upgrading	G06F 11/1433
Arrangements for updating broadcast information or broadcast-related information	H04H 60/25

H04N 21/462

[N: Content or additional data management e.g. creating a master electronic program guide from data received from the Internet and a Head-end, controlling the complexity of a video stream by scaling the resolution or bit-rate based on the client capabilities]

Definition statement

This subclass/group covers:

Management functions implemented in the client device.

Example(s) of documents found in this subgroup: US 2008/0205857 A1

H04N 21/4621

[N: Controlling the complexity of the content stream or additional data, e.g. lowering the resolution or bit-rate of the video stream for a mobile client with a small screen (arrangements for using the results of monitoring on user's side in broadcast systems H04H 60/65; flow control in packet networks H04L 12/569)]

Definition statement

This subclass/group covers:

Scalability control is performed by the client device, for example to forward the data to a low-resolution device on a home network.

Example(s) of documents found in this subgroup: EP 1 717 976 A2, US 2003/0126238 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for using the results of monitoring on user's side in broadcast systems	H04H 60/65
Flow control in packet networks	H04L 12/569

H04N 21/4622

[N: Retrieving content or additional data from different sources, e.g. from a broadcast channel and the Internet (web site content organization and management for information retrieval from the Internet G06F 17/3089; transmission by internet of broadcast information H04H 60/82; stock exchange data over packet-switching network H04L 12/1804; push services including data channel over packet-switching network H04L 12/1859)]

Definition statement

This subclass/group covers:

- The client combines data received from different sources, like EPG data from cable operators, satellite services, internet or internally stored.
- Describes also the connection to the same source via different networks (e.g. a part of the content is distributed via TV broadcast and another one via internet).

Example(s) of documents found in this subgroup: US 2007/0245399 A1

References relevant to classification in this group

This subclass/group does not cover:

Web site content organization and management for information retrieval from the Internet	G06F 17/3089
Transmission by internet of broadcast information	H04H 60/82
Stock exchange data over packet-switching network	H04L 12/1804
Push services including data channel over packet-switching network	H04L 12/1859

H04N 21/4623

[N: Processing of entitlement messages, e.g. Entitlement Control Message [ECM], Entitlement Management Message [EMM] (arrangements for conditional access to broadcast information or to broadcast-related services H04H 60/14)]

Definition statement

This subclass/group covers:

Processing of the ECM, EMM messages received from the server. Details of the descrambling are found elsewhere.

Example(s) of documents found in this subgroup: EP 1 176 827 A2

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for conditional access to broadcast information or to broadcast-related services	H04H 60/14

H04N 21/4627

[N: Rights management [N: associated to the content] (protecting software against unauthorised usage in a vending or licensing environment G06F21/00N7; security in data switching network management H04L 12/2461; security management or policies for network security H04L 29/06986; access security in wireless networks H04W 12/08)]

Definition statement

This subclass/group covers:

Described is here the management of the rights attached to the content. It retrieves the rights associated with the content. The rights of the different users are defined using an application described elsewhere.

Example(s) of documents found in this subgroup: WO 02/33509 A2

References relevant to classification in this group

This subclass/group does not cover:

Protecting software against unauthorised usage in a vending or licensing environment	**G06F21/00N7**

Security in data switching network management	H04L 12/2461
Security management or policies for network security	H04L 29/06986
Access security in wireless networks	H04W 12/08

H04N 21/466

[N: Learning process for intelligent management, e.g. learning user preferences for recommending movies (monitoring of user activities for profile generation for accessing a video database G06F17/30M5; computer systems using learning methods G06N 3/08; services using the results of monitoring in broadcast systems H04H 60/61)]

Definition statement

This subclass/group covers:

The agent is an intelligent system, which learns and tries to adapt its output to its inputs. It receives input data directly from the viewer (explicit profile) via a corresponding user interface (e.g. movie ratings) as well as from the monitoring module (implicit profile). Its output can be a control signal to the filter or a recommendation list, which will be displayed in a corresponding user interface. Learning can be implemented using one of the method described below, but can also be a combination of several methods.

Example(s) of documents found in this subgroup: US 2002/0123928 A1, US 2005/0193414 A1

References relevant to classification in this group

This subclass/group does not cover:

Monitoring of user activities for profile generation for accessing a video database	**G06F17/30M5**
Computer systems using learning methods	G06N 3/08
Services using the results of monitoring in broadcast systems	H04H 60/61

H04N 21/4661

[N: Deriving a combined profile for a plurality of end-users of the same client, e.g. for family members within a home (data

switching network applications using user profiles H04L 29/08936)]

Definition statement

This subclass/group covers:

At the opposite of a case-based agent, a collaborative system is based on the similarity between user profiles. A user is compared to other users and if it is found as an example that he belongs to a user group, the recommendation list of this group will be used for him. As this system is implemented on the client side, only documents related to user profiles on the same client (stored locally) or profiles from other clients but provided by the server to the concerned client should be classified here.

Example(s) of documents found in this subgroup: WO 03/043337 A1

References relevant to classification in this group

This subclass/group does not cover:

Data switching network applications using user profiles	H04L 29/08936
Deriving collaborative data from a large group of end-users on the server	H04N 21/252

H04N 21/4662

[N: characterized by learning algorithms]

Definition statement

This subclass/group covers:

Types of learning method used by the agent.

Example(s) of documents found in this subgroup: WO 2007/054879 A1

H04N 21/4663

[N: involving probabilistic networks, e.g. Bayesian networks]

Definition statement

This subclass/group covers:

Bayesian (probabilistic) networks are used.

Example(s) of documents found in this subgroup: WO 01/58145 A2

H04N 21/4665

[N: involving classification methods, e.g. Decision trees]

Definition statement

This subclass/group covers:

Decision trees or any type or classifiers are used.

Example(s) of documents found in this subgroup: US 6,460,036 B1

H04N 21/4666

[N: using neural networks, e.g. processing the feedback provided by the user]

Definition statement

This subclass/group covers:

The agent will try to match its output to the feedback provided by the user using a neural network. The learning process requires several iterations to converge.

Example(s) of documents found in this subgroup: WO 03/ 079688 A1

H04N 21/4667

[N: Processing of monitored end-user data, e.g. trend analysis based on the log file of viewer selections]

Definition statement

This subclass/group covers:

- User selections are recorded in a history file. Therefore this place should only be used to describe processing operations of the history, like trend analysis, clustering,...
- The generation of the user profile, if disclosed explicitely. The dynamic adaptation of the profile is performed by an intelligent agent.

Example(s) of documents found in this subgroup: WO 2007/078847 A2

H04N 21/4668

[N: for recommending content, e.g. movies]

Definition statement

This subclass/group covers:

Generation of a recommendation or suggestion list.

Example(s) of documents found in this subgroup: WO 2007/063468 A1

H04N 21/47

[N: End-user applications (interaction techniques for graphical user interfaces G06F 3/048; receiver circuitry for displaying additional information H04N 5/445; software engineering for user interfaces G06F9/44G4W; services or applications for real-time multimedia communications H04L 29/06387)]

Definition statement

This subclass/group covers:

End user applications in the sense of services provided by the multimedia system to the user. There are basically 2 categories of applications: the ones providing local interactivity and the ones requiring an uplink.

Example(s) of documents found in this subgroup: WO 2007/067974 A2

References relevant to classification in this group

This subclass/group does not cover:

Software engineering for user interfaces	**G06F9/44G4W**
Services or applications for real-time multimedia communications	H04L 29/06387

H04N 21/472

[N: End-user interface for requesting content, additional data or services; End-user interface for interacting with content, e.g. for content reservation or setting reminders, for requesting event notification, for manipulating displayed content (end-user interfaces for retrieving video data from a database G06F17/30M5; content on demand in one way streaming for real-time multimedia communications H04L 29/06462)]

Definition statement

This subclass/group covers:

A request application allows the user to request a program or any additional information. Covers all on-request applications. The request may be fullfilled immediately, with a small delay or later in the future. The headgroup covers also requests for downloading music.

Example(s) of documents found in this subgroup: EP 1 947 855 A1

References relevant to classification in this group

This subclass/group does not cover:

End-user interfaces for retrieving video data from a database	**G06F17/30M5**
Content on demand in one way streaming for real-time multimedia communications	H04L 29/06462

H04N 21/47202

[N: for requesting content on demand, e.g. video on demand]

Definition statement

This subclass/group covers:

True VOD systems allow to request and receive a movie within a short delay. Therefore the movie will be streamed only to the requesting user or it will be available on a multicast channel. It covers also details of the menu to stop, pause, FFWD, RWD or play a movie.

Example(s) of documents found in this subgroup: GB 244974 A1

H04N 21/47205

[N: for manipulating displayed content, e.g. interacting with MPEG-4 objects, editing locally]

Definition statement

This subclass/group covers:

- The user can interact with MPEG-4 objects.
- Editing by the end-user on the client device.

Example(s) of documents found in this subgroup: US 2008/0201369 A1

H04N 21/47208

[N: for requesting near-video-on-demand content]

Definition statement

This subclass/group covers:

Movies are sent on a regular basis with a time offset (staggered) on different broadcast channels.

Example(s) of documents found in this subgroup: WO 2007/024233 A1

H04N 21/47211

[N: for requesting pay-per-view content (payment schemes payment architectures or payment protocols G06Q 20/00, G07F)]

Definition statement

This subclass/group covers:

Broadcast programs not being NVOD associated to a request for purchasing should be classified here. Includes free preview programs.

Example(s) of documents found in this subgroup: WO 97/50251

References relevant to classification in this group

This subclass/group does not cover:

Payment schemes payment architectures or payment protocols	G06Q 20/00, G07F

H04N 21/47214

[N: for content reservation or setting reminders; for requesting event notification, e.g. of sport results or stock market (notification of incoming messages in packet switching networks H04L 12/587; stock exchange data over packet-switching network H04L 12/1804; push services over packet-switching network H04L 12/1859)]

Definition statement

This subclass/group covers:

- The viewer can mark a program displayed in an EPG for later viewing or recording. Pertains to the reservation of time, channel or a piece of content.
- Bookmarking operations as well as the request for notification when an event has occured (e.g. sport results or stock exchange above a given level).

Example(s) of documents found in this subgroup: WO 2005/088969 A1

References relevant to classification in this group

This subclass/group does not cover:

Notification of incoming messages in packet switching networks	H04L 12/587
Stock exchange data over packet-switching network	H04L 12/1804
Push services over packet-switching network	H04L 12/1859

H04N 21/47217

[N: for controlling playback functions for recorded or on-demand content, e.g. using progress bars, mode or playpoint indicators or bookmarks (specific graphical features in visual interfaces H04N 21/4312)]

References relevant to classification in this group

This subclass/group does not cover:

Specific graphical features in visual interfaces	H04N 21/4312

H04N 21/4722

[N: for requesting additional data associated with the content]

Definition statement

This subclass/group covers:

The user requests actively for additional data, e.g. by pressing a button on a remote control, when an icon signaling the presence of interactive content is displayed on the screen.

Example(s) of documents found in this subgroup: WO 97/50251

H04N 21/4725

[N: using interactive regions of the image, e.g. hot spots (details of information retrieval from the Internet by using URLs G06F 17/30876; processing chained hypermedia data for information retrieval G06F17/30G4)]

Definition statement

This subclass/group covers:

Additional data is accessed by clicking on a hotspot

Example(s) of documents found in this subgroup: US 2005/0086690 A1

References relevant to classification in this group

This subclass/group does not cover:

Details of information retrieval from the Internet by using URLs	G06F 17/30876
Processing chained hypermedia data for information retrieval	**G06F17/30G4**

H04N 21/4728

[N: for selecting a Region Of Interest [ROI], e.g. for requesting a higher resolution version of a selected region]

Definition statement

This subclass/group covers:

Manual selection of a portion of the displayed frame on the screen by the user.

Example(s) of documents found in this subgroup: WO 2007/057875 A2

H04N 21/475

[N: End-user interface for inputting end-user data, e.g. personal identification number [PIN], preference data]

Definition statement

This subclass/group covers:

Profile applications allow to define parameters, which will control the viewing experience of the viewer.

Example(s) of documents found in this subgroup: WO 2008/099303

H04N 21/4751

[N: for defining user accounts, e.g. accounts for children]

Definition statement

This subclass/group covers:

A master user (e.g. parent) defines several accounts for the users of the client (e.g. children).

Example(s) of documents found in this subgroup: WO 2007/103154

H04N 21/4753

[N: for user identification, e.g. by entering a PIN or password (authentication mechanisms using passwords for network security H04L 29/06782)]

Definition statement

This subclass/group covers:

The user identifies himself to the client by entering a password or a PIN number. Passive identification is to be found elsewhere.

References relevant to classification in this group

This subclass/group does not cover:

Authentication mechanisms using passwords for network security	H04L 29/06782

H04N 21/4755

[N: for defining user preferences, e.g. favourite actors or genre (retrieval personalisation and generation of user profiles for the retrieval of video data G06F17/30M5; Data switching network applications using user profiles H04L 29/08936)]

Definition statement

This subclass/group covers:

The user enters for example his favorite channels, actors, directors, program genre or just a rating level (as used with a V-chip). Covers menus for parental control in general.

Example(s) of documents found in this subgroup: US 2002/0140728 A1

References relevant to classification in this group

This subclass/group does not cover:

Retrieval personalisation and generation of user profiles for the retrieval of video data	**G06F17/30M5**
Data switching network applications using user profiles	H04L 29/08936

H04N 21/4756

[N: for rating content, e.g. scoring a recommended movie]

Definition statement

This subclass/group covers:

This application is required for example by the agent module during its learning phase. Items are displayed on the screen and the user is requested to provide a rating.

Example(s) of documents found in this subgroup: US 6,816,172 B1

H04N 21/4758

[N: for providing answers, e.g. voting]

Definition statement

This subclass/group covers:

Questions and answers. It can be used to poll users about their opinion regarding a problem raised during the TV broadcast, to react on an advertisement or in a TV quiz. Covers voting.

Example(s) of documents found in this subgroup: EP 1 788 810 A1

H04N 21/478

[N: Supplemental services, e.g. displaying phone caller identification, shopping application]

Definition statement

This subclass/group covers:

Described are here applications, which are provided as additional services to the users but do not belong to the core services provided in a multimedia system.

Example(s) of documents found in this subgroup: US 2008/0235745 A1

H04N 21/47805

[N: Electronic banking (banking in general G06Q40/00A)]

Definition statement

This subclass/group covers:

On-line banking application including the trading of stocks.

Example(s) of documents found in this subgroup: US 2002/0087968 A1

References relevant to classification in this group

This subclass/group does not cover:

Banking in general	**G06Q40/00A**

H04N 21/4781

[N: Games]

Definition statement

This subclass/group covers:

Only games, which do not interact with the video stream (e.g. MPEG-4 based game) and are not of a question and answer (e.g. quiz) type. They can be local or played with remote opponents.

Example(s) of documents found in this subgroup: WO 2007/076504 A2

H04N 21/47815

[N: Electronic shopping (payment schemes, payment architectures or payment protocols for electronic shopping systems G06Q20/00K3B)]

Definition statement

This subclass/group covers:

TV home-shopping applications, also requesting quotes for services, excludes the request for additional data.

Example(s) of documents found in this subgroup: US 2008/0282283 A1

References relevant to classification in this group

This subclass/group does not cover:

Payment schemes, payment architectures or payment protocols for electronic shopping systems	**G06Q20/00K3B**

H04N 21/4782

[N: Web browsing [N: e.g. WebTV] (information retrieval from

the Internet G06F 17/30861; protocols for network applications involving the use of web-based technology H04L 29/0809)]

Definition statement

This subclass/group covers:

The TV terminal is used as a WWW browser (e.g. WebTV) to display WWW pages. It must not be confused with systems where video or program related data is retrieved from the Internet without active browsing by the user. This place should not be used either for PC's with an internet connection.

Example(s) of documents found in this subgroup: US 2009/0019495 A1

References relevant to classification in this group

This subclass/group does not cover:

Information retrieval from the Internet	G06F 17/30861
Protocols for network applications involving the use of web-based technology	H04L 29/0809

H04N 21/4784

[N: receiving rewards (payment schemes, architectures or protocols G06Q 20/00; e-commerce G06Q 30/00; charging arrangements in data networks H04L 12/14)]

Definition statement

This subclass/group covers:

Users receive awards, coupons, prizes, points, air miles...

Example(s) of documents found in this subgroup: WO 2008/146270 A1

References relevant to classification in this group

This subclass/group does not cover:

Charging arrangements in data networks	H04L 12/14

H04N 21/4786

[N: e-mailing (message switching systems, e.g. electronic mail systems H04L 12/58)]

Definition statement

This subclass/group covers:

E-mail application as known from computer systems but implemented on a Set-Top-Box or TV receiver.

Example(s) of documents found in this subgroup: WO 2005/041529 A1

References relevant to classification in this group

This subclass/group does not cover:

Message switching systems, e.g. electronic mail systems	H04L 12/58

H04N 21/4788

[N: communicating with other users, e.g. chatting (arrangements for providing for computer conferences, e.g. chat rooms, to substation in data switching networks H04L 12/1813; protocols for peer-to-peer networking in communication control or processing H04L 29/08306)]

Definition statement

This subclass/group covers:

Systems allowing users from distinct clients to communicate with each other, for example to exchange videos or any kind of data but no E-mails. Covers chat applications, bulletin board, forum.

Example(s) of documents found in this subgroup: WO 2007/117251 A1

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for providing for computer conferences, e.g. chat rooms, to substation in data switching networks	H04L 12/1813
Protocols for peer-to-peer networking in communication control or processing	H04L 29/08306

H04N 21/482

[N: End-user interface for program selection (systems specially adapted for using EPGs in broadcast systems H04H 60/72)]

Definition statement

This subclass/group covers:

The selection menu allows the user to select actively a piece of content from a plurality. This typically a function provided by an Electronic Program Guide.

Example(s) of documents found in this subgroup: US 2006/0095936 A1

References relevant to classification in this group

This subclass/group does not cover:

Systems specially adapted for using EPGs in broadcast systems	H04H 60/72

H04N 21/4821

[N: using a grid, e.g. sorted out by channel and broadcast time]

Definition statement

This subclass/group covers:

Programs are displayed in a grid, sorted out by channel and broadcast time.

Example(s) of documents found in this subgroup: US 2008/0263600 A1

H04N 21/4823

[N: using a channel name]

Definition statement

This subclass/group covers:

Channels are selected by entering their name instead of number

Example(s) of documents found in this subgroup: EP 1 363204 A2

H04N 21/4825

[N: using a list of items to be played back in a given order, e.g. playlists]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: WO 2006/094131 A2

H04N 21/4826

[N: using recommendation lists, e.g. of programs or channels sorted out according to their score]

Definition statement

This subclass/group covers:

A recommendation list of desirable items has been compiled by the agent module and is displayed to the user. It is mostly an ordered list, where are items are sorted out according to their score, which may be also displayed next to the item descriptor. Items can be programs or channels.

Example(s) of documents found in this subgroup: WO 2008/117245 A2

H04N 21/4828

[N: for searching program descriptors (retrieval of video data G06F17/30M5)]

Definition statement

This subclass/group covers:

The application provides a search function, for example using keywords to retrieve an actor's name.

Example(s) of documents found in this subgroup: US 6,216,264 B1

References relevant to classification in this group

This subclass/group does not cover:

Retrieval of video data	**G06F17/30M5**

H04N 21/485

[N: End-user interface for client configuration]

Definition statement

This subclass/group covers:

Configuration applications allow the user to define the settings of the client.

Example(s) of documents found in this subgroup: US 2007/0199040 A2

H04N 21/4852

[N: for modifying audio parameters, e.g. switching between mono and stereo]

Definition statement

This subclass/group covers:
Sound volume, mono/stereo.

Example(s) of documents found in this subgroup: US 2008/0016532 A1

H04N 21/4854

[N: for modifying image parameters, e.g. image brightness, contrast]

Definition statement

This subclass/group covers:
Image brightness, contrast, setting of the color channels.

Example(s) of documents found in this subgroup: WO 03/036949 A1

H04N 21/4856

[N: for language selection, e.g. for the menu or subtitles]

Definition statement

This subclass/group covers:
Language selection for e.g. configuration or setup menus or subtitles

Example(s) of documents found in this subgroup: EP 1 962 505 A2

H04N 21/4858

[N: for modifying screen layout parameters, e.g. fonts, size of the windows]

Definition statement

This subclass/group covers:
Layout parameters such as colors, fonts, size of the windows.

Example(s) of documents found in this subgroup: WO 2006/091740 A2

H04N 21/488

[N: Data services, e.g. news ticker (systems specially adapted

for using meteorological information in broadcast systems H04H 60/71)]

Definition statement

This subclass/group covers:

Presentation of information and data services. Classified should be here only applications pertaining to the display of such data.

Example(s) of documents found in this subgroup: US 2002/0176000 A1

References relevant to classification in this group

This subclass/group does not cover:

Systems specially adapted for using meteorological information in broadcast systems	H04H 60/71

H04N 21/4882

[N: for displaying messages, e.g. warnings, reminders (arrangements for providing short real-time information to substation in data switching networks H04L 12/1895)]

Definition statement

This subclass/group covers:

- Display of warnings or reminders. Pertains usually to textual or graphical information, which is displayed for a brief period of time.
- Download status bar.

Example(s) of documents found in this subgroup: WO 97/19555

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for providing short real-time information to substation in data switching networks	H04L 12/1895

H04N 21/4884

[N: for displaying subtitles]

Definition statement

This subclass/group covers:
Subtitles or closed-caption.

Example(s) of documents found in this subgroup: WO 2004/098193

H04N 21/4886

[N: for displaying a ticker, e.g. scrolling banner for news, stock exchange, weather data]

Definition statement

This subclass/group covers:
News, stock exchange, weather data are displayed as a scrolling banner on the screen.

Example(s) of documents found in this subgroup: WO 2008/130061

H04N 21/4888

[N: for displaying teletext characters]

Definition statement

This subclass/group covers:
Teletext service.

H04N 21/60

[N:using] Network structure or processes [N: specifically adapted] for video distribution between server and client or between remote clients (data switching networks H04L 12/00; wireless communication networks H04W) ; Control signaling [N: specific to video distribution] between clients, server and network components [N:, e.g. to video encoder or decoder]; Transmission of management data between server and client [N: e.g. sending from server to client commands for recording incoming content stream]; Communication details between server and client (Protocols for communication control and processing in data networks H04L 29/06; Protocols for client-server architecture H04L29/08C8)

Definition statement

This subclass/group covers:

- Subject matter comprising processes and structure involving exchange of data and control signals between servers, clients and intermediate components connected within a network(s). These processes and structure generally involve communication between intermediate components, the network interface of servers and that of the clients, resulting in data or control signals being exchanged there between in a particular manner and/or for a particular purpose and processing operations performed by the network itself.
- The first layer is directed to the physical description of the network such as the nature of the network used for the downlink and uplink connection (e.g. satellite, cable, internet, GSM) and the components used for the transmission of the electromagnetic waves (e.g. taps, splitters, amplifiers).
- The second layer describes communication aspects such as addressing (e.g. multicasting), the type of protocol used (e.g. DSM-CC, ATM). It also includes the exchange of low-level control signals originating from server (e.g. encryption key), client or network as well as processing operations by the network itself (e.g. protocol conversion, dropping of packets).
- The third layer pertains to the exchange of high-level control signals originating from client and transmitted to the server (e.g. viewing history, VOD control parameters), or issued by the server and sent to the client (e.g. trigger recording, channel tuning or sending setup parameters).
- The subgroup is directed to the invention information including data transactions necessitating communication between server, client and network. Documents where the invention information is related to the transmitter or receiver per se are placed in the S or C models, respectively.

Examples of documents placed in H04N 21/60 (1) The subgroup is directed to the invention information including physical level components of the distribution model. The physical level components of the T-model preclude physical components of the server and client models. For example, documents where the invention information includes physical level components (such as taps, splitters, amplifiers, etc) are placed in H04N 21/6106, whereas server physical components (such as modulators, multiplexers, etc) are placed in H04N 21/21, similarly client physical components (such as tuners, demultiplexers, etc) are placed in H04N 21/41. (2) This subgroup is directed to describing the type of protocol used (e.g. ATM) for transport on a specific type of network. The actual adaptation process is described elsewhere

References relevant to classification in this group

This subclass/group does not cover:

Protocols for communication control and processing in data networks	H04L 29/06

Protocols for client-server architecture	**H04L29/08C8**

H04N 21/61

[N: Network physical structure; Signal processing (H04B takes precedence)]

Definition statement

This subclass/group covers:

Physical level and network topology.

References relevant to classification in this group

This subclass/group does not cover:

Transmission	H04B

H04N 21/6106

[N: specially adapted to the downstream path of the transmission network]

Definition statement

This subclass/group covers:

Type of the downlink connection. The first 3 are trivial and should only be used if they play a significant part in the description of a document.

H04N 21/6112

[N: involving terrestrial transmission, e.g. DVB-T]

Definition statement

This subclass/group covers:

Terrestrial transmission. Preferrably DVB-T documents should be classified here.

H04N 21/6125

[N: involving transmission via Internet (transmission by internet of broadcast information H04H 60/82)]

Definition statement

This subclass/group covers:

- Typically video streaming via Internet. It must not be confused with browsers or WWW servers providing additional data.
- Computer networks in general (e.g. ATM).

References relevant to classification in this group

This subclass/group does not cover:

IP communication protocol	H04N 21/64322
Transmission by internet of broadcast information	H04H 60/82

H04N 21/6131

[N: involving transmission via a mobile phone network (wireless downlink channel access H04W 74/006)]

Definition statement

This subclass/group covers:

Multimedia data are transported over a mobile phone network. Excluded are here wireless transmission in home networks but covers wireless wide area networks and wireless connection to a public access point.

References relevant to classification in this group

This subclass/group does not cover:

Wireless downlink channel access	H04W 74/006

H04N 21/6137

[N: involving transmission via a telephone network, e.g. POTS]

Definition statement

This subclass/group covers:

Video over a phone line. Excludes xDSL-type connections described elsewhere. Using the H.223 multiplexing and H.245 control standards

H04N 21/615

[N: Signal processing at physical level (signal processing in analog two way television systems H04N 7/173)]

Definition statement

This subclass/group covers:

Details of signal processing at lowest ISO level.

References relevant to classification in this group

This subclass/group does not cover:

Signal processing in analog two-way television systems	H04N 7/173

H04N 21/6156

[N: specially adapted to the upstream path of the transmission network]

Definition statement

This subclass/group covers:

Type of the uplink connection.

H04N 21/6162

[N: involving terrestrial transmission, e.g. DVB-T]

Definition statement

This subclass/group covers:

Terrestrial transmission. Preferrably DVB-T documents should be classified here.

H04N 21/6168

[N: involving cable transmission, e.g. using a cable modem]

Definition statement

This subclass/group covers:

Typically for uplinks using a cable modem.

H04N 21/6175

[N: involving transmission via Internet (broadcast-related systems characterised by the transmission system being the Internet H04H 60/82)]

References relevant to classification in this group

This subclass/group does not cover:

Broadcast-related systems characterised by the transmission system being the Internet	H04H 60/82

H04N 21/6181

[N: involving transmission via a mobile phone network (arrangements for providing broadcast or conference services to substation in data switching networks in combination with wireless systems H04L 12/189; wireless uplink channel access H04W 74/004)]

Definition statement

This subclass/group covers:

Low-cost clients do not provide a return channel. The uplink can still be established if the user owns a mobile phone. Excluded are here wireless transmission in home networks but covers wireless wide area networks and wireless connection to a public access point.

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for providing broadcast or conference services to substation in data switching networks in combination with wireless systems	H04L 12/189
Wireless uplink channel access	H04W 74/004

H04N 21/6187

[N: involving transmission via a telephone network, e.g. POTS]

Definition statement

This subclass/group covers:

Uplink using an analog phone modem for example 2-way TV systems.

H04N 21/6193

[N: involving transmission via a satellite (arrangements for data linking, networking or transporting, or for controlling an end to end session in a satellite broadcast system H04B 7/18526)]

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for data linking, networking or transporting, or for controlling an end to end session in a satellite broadcast system	H04B 7/18526

H04N 21/63

Control signaling [N: related to video distribution] between client, server and network components; Network processes for video distribution between server and clients [N: or between remote clients], e.g. transmitting basic layer and enhancement layers over different transmission paths, setting up a peer-to-peer communication via Internet between remote STB's; Communication protocols; Addressing (signalling, control or architecture for real-time multimedia communications H04L 29/06183; arrangements for peer-to-peer communications H04L 29/08306)

Definition statement

This subclass/group covers:

Low-level control signals exchanged between client and server.

References relevant to classification in this group

This subclass/group does not cover:

Signalling, control or architecture for real-time multimedia communications	H04L 29/06183
Arrangements for peer-to-peer communications	H04L 29/08306

H04N 21/631

[N: Multimode Transmission, e.g. transmitting basic layers and enhancement layers of the content over different transmission paths or transmitting with different error corrections, different keys or with different transmission protocols]

Definition statement

This subclass/group covers:

Transmission of structured video content (i.e. video which is provided as layers, different versions, objects etc.) over different transmission paths or with different error corrections, different scrambling keys, using different transmission protocols etc. It describes the presence of different transmission "conditions" for the layers, versions or objects. Application example: A high error protection and a network with good QoS is used for important video layers, less important layers are sent with no error correction on a more error prone network.

H04N 21/632

[N: using a connection between clients on a wide area network, e.g. setting up a peer-to-peer communication via Internet for retrieving video segments from the hard-disk of other client devices (broadcast-related systems characterised by transmission among terminal devices H04H 60/80; protocols for peer-to-peer networking in communication control or processing H04L 29/08306)]

Definition statement

This subclass/group covers:

Content can be accessed on the storage medium of client devices, e.g. parts of a movie can be retrieved from the hard disk of other users, instead of using the cache of a server. Chatting applications are classified elsewhere.

References relevant to classification in this group

This subclass/group does not cover:

Broadcast-related systems characterised by transmission among terminal devices	H04H 60/80
Protocols for peer-to-peer networking in communication control or processing	H04L 29/08306

H04N 21/633

[N: Control signals issued by server directed to the network components or client (management of faults, events, alarms in data networks H04L 12/2419)]

Definition statement

This subclass/group covers:

Server-side control signals. Described are here low-level control signals issued by the server for controlling the network or the client.

References relevant to classification in this group

This subclass/group does not cover:

Management of faults, events, alarms in data networks	H04L 12/2419

H04N 21/6334

[N: for authorization, e.g. by transmitting a key (arrangements for secret or secure communication H04L 9/00; wireless communications network key management H04W 12/04; wireless communications network access security H04W 12/08)]

References relevant to classification in this group

This subclass/group does not cover:

Wireless communications network key management	H04W 12/04
Wireless communications network access security	H04W 12/08

H04N 21/63345

[N: by transmitting keys (key distribution for secret or secure communication H04L 9/08; arrangements for network security key management H04L 29/06707)]

Definition statement

This subclass/group covers:

Download of keys, for example transmission of ECM/EMM in a conditional access system.

References relevant to classification in this group

This subclass/group does not cover:

Key distribution for secret or secure communication	H04L 9/08
Arrangements for network security key management	H04L 29/06707

H04N 21/6336

[N: directed to decoder]

Definition statement

This subclass/group covers:

Control of the video decoder by the server

H04N 21/637

[N: Control signals issued by the client directed to the server or network components]

Definition statement

This subclass/group covers:

Control signals sent by the client device, e.g. for controlling the network or the server.

H04N 21/6371

[N: directed to network]

Definition statement

This subclass/group covers:

Control signals sent by the client device, e.g. for controlling the network or the server.

H04N 21/6373

for rate control [N: e.g. request to the server to modify its transmission rate] (flow control in packet networks H04L 12/569)]

Definition statement

This subclass/group covers:

The client sends a control signal to the server (e.g. encoder) or to the network requesting a bitrate modification.

References relevant to classification in this group

This subclass/group does not cover:

Flow control in packet networks	H04L 12/569

H04N 21/6375

for requesting retransmission [N: , e.g. of data packets lost or corrupted during transmission from server] (ARQ protocols H04L 1/18; Transmission Control Protocol / Internet Protocol [TCP/IP] H04L 29/06095)

Definition statement

This subclass/group covers:

The client asks the server or the network to retransmit some data packets that have been lost or corrupted.

References relevant to classification in this group

This subclass/group does not cover:

ARQ protocols	H04L 1/18
Transmission Control Protocol / Internet Protocol [TCP/IP]	H04L 29/06095

H04N 21/6377

[N: directed to server (control of source by destination in one way streaming for real-time multimedia communications H04L 29/06469)]

Definition statement

This subclass/group covers:

Control signals issued by the client to the server.

References relevant to classification in this group

This subclass/group does not cover:

Control of source by destination in one way streaming for real-time multimedia communications	H04L 29/06469

H04N 21/63775

[N: for uploading keys, e.g. for a client to communicate its public key to the server (arrangements for network security key management H04L 29/06707)]

Definition statement

This subclass/group covers:

Describes clients communicating public key to the server.

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for network security key management	H04L 29/06707

H04N 21/6379

directed to encoder [N:, e.g. for requesting a lower encoding rate]

Definition statement

This subclass/group covers:

Control of the video encoder, also requests for transcoding.

H04N 21/64

[N: Addressing (multicast or broadcast in one way streaming for real-time multimedia communications H04L 29/06455; arrangements for addressing and naming in data networks H04L 29/12009)]

References relevant to classification in this group

This subclass/group does not cover:

Multicast or broadcast in one way streaming for real-time multimedia communications	H04L 29/06455
Arrangements for addressing and naming in data networks	H04L 29/12009

H04N 21/6402

[N: Address allocation for clients (address allocation in data networks H04L 29/12207)]

Definition statement

This subclass/group covers:

Describes the process of allocating adresses to the clients

References relevant to classification in this group

This subclass/group does not cover:

Address allocation in data networks	H04L 29/12207

H04N 21/6405

[N: Multicasting (data broadcast and multicast in packet switching networks H04L 12/18)]

Definition statement

This subclass/group covers:

Data is sent to a group of clients.

References relevant to classification in this group

This subclass/group does not cover:

Data broadcast and multicast in packet switching networks	H04L 12/18

H04N 21/6408

[N: Unicasting]

Definition statement

This subclass/group covers:

Data is sent to only one client on a dedicated channel.

H04N 21/643

[N: using dedicated] Communication protocols (streaming protocols for real-time multimedia communications H04L 29/06517)

Definition statement

This subclass/group covers:

Details of protocols are classified elsewhere.

References relevant to classification in this group

This subclass/group does not cover:

Streaming protocols for real-time multimedia communications	H04L 29/06517

H04N 21/64307

[N: ATM]

Definition statement

This subclass/group covers:

Adaptation of MPEG packets for the transport on the ATM network.

H04N 21/64322

[N: IP]

Definition statement

This subclass/group covers:

Similar for the adaptation to an IP network.

H04N 21/6433

[N: Digital Storage Media - Command and Control Protocol [DSM-CC]]

Definition statement

This subclass/group covers:

DSM-CC has been designed for MPEG systems.

H04N 21/647

[N: Control signaling between network components and server or clients; Network processes for video distribution between server and clients, e.g. controlling the quality of the video stream, by dropping packets, protecting content from unauthorized alteration within the network, monitoring of network load, bridging between two different networks, e.g. between IP and wireless (signalling, control or architecture for real-time multimedia communications H04L 29/06183)]

Definition statement

This subclass/group covers:

- Network control and processing.
- Low-level control signals issued by the network for controlling the server or the client as well as operations performed by the network on the content.

References relevant to classification in this group

This subclass/group does not cover:

Signalling, control or architecture for real-time multimedia communications	H04L 29/06183

H04N 21/64707

[N: for transferring content from a first network to a second network, e.g. between IP and wireless]

Definition statement

This subclass/group covers:

The input signal is routed during the transport to a different network, for example the video stream is sent by the server on an IP network and received by the client via a wireless network.

H04N 21/64715

[N: Protecting content from unauthorized alteration within the network (verifying the information received for network security in communication control or processing

H04L 29/06857; integrity in wireless network security H04W 12/10)]

Definition statement

This subclass/group covers:

Additional measures to protect the data from forbidden alterations during the transport.

References relevant to classification in this group

This subclass/group does not cover:

Verifying the information received for network security in communication control or processing	H04L 29/06857
Integrity in wireless network security	H04W 12/10

H04N 21/64723

[N: Monitoring of network processes or resources, e.g. monitoring of network load (traffic related reporting in data switching networks H04L 12/2626)]

References relevant to classification in this group

This subclass/group does not cover:

Traffic related reporting in data switching networks	H04L 12/2626

H04N 21/6473

[N: Monitoring network processes errors (counter-measures to a fault in communication control or processing H04L 29/14)]

Definition statement

This subclass/group covers:

Monitoring of error during network processing.

References relevant to classification in this group

This subclass/group does not cover:

Counter-measures to a fault in communication control or processing	H04L 29/14

H04N 21/64738

[N: Monitoring network characteristics, e.g. bandwidth, congestion level (data switched network analysis H04L 12/2414; monitoring functioning in data switched networks H04L 12/2642; flow control in packet networks H04L 12/569)]

Definition statement

This subclass/group covers:

Monitoring by the network of the congestion level, bandwidth, BER, status of the connection (dropped).

References relevant to classification in this group

This subclass/group does not cover:

Data switched network analysis	H04L 12/2414
Monitoring functioning in data switched networks	H04L 12/2642
Flow control in packet networks	H04L 12/569

H04N 21/64746

[N: Control signals issued by the network directed to the server or the client]

Definition statement

This subclass/group covers:

Network-side control signals.

H04N 21/64769

[N: for rate control (flow control in packet networks H04L 12/569)]

Definition statement

This subclass/group covers:

The network sends a control signal to the server (e.g. encoder or pump) requesting a bitrate adaptation to the bandwidth.

References relevant to classification in this group

This subclass/group does not cover:

Flow control in packet networks	H04L 12/569

H04N 21/64776

for requesting retransmission, e.g. of data packets lost or corrupted during transmission from server (ARQ protocols H04L 1/18; Transmission Control Protocol / Internet Protocol [TCP/IP] H04L 29/06095)

Definition statement

This subclass/group covers:

The network asks the server to retransmit some data packets that have been lost or corrupted.

References relevant to classification in this group

This subclass/group does not cover:

ARQ protocols	H04L 1/18
Transmission Control Protocol / Internet Protocol [TCP/IP]	H04L 29/06095

H04N 21/64784

[N: Data processing by the network (data processing in packet switching systems H04L 12/56; flow control in packet networks H04L 12/569; intermediate storage or scheduling H04L 12/5694; protocols involving intermediate processing or storage in communication networks H04L 29/08702)]

Definition statement

This subclass/group covers:

The data stream can be altered by the transport medium.

References relevant to classification in this group

This subclass/group does not cover:

Data processing in packet switching systems	H04L 12/56
Flow control in packet networks	H04L 12/569
Intermediate storage or scheduling	H04L 12/5694
Protocols involving intermediate processing or storage in communication networks	H04L 29/08702
Secondary or local servers, which could also alter the data	H04N 21/222

H04N 21/64792

[N: Controlling the complexity of the content stream, e.g. by dropping packets (media manipulation, adaptation or conversion at an intermediate station in one way streaming for real-time multimedia communications H04L 29/06503; arrangements for reducing the amount or size of exchanged application data in the network H04L 29/08783; negotiation of resources in wireless networks H04W 28/16)]

Definition statement

This subclass/group covers:

The control of the complexity is performed on the network / within the transmission medium (e.g. routers drop packets)

References relevant to classification in this group

This subclass/group does not cover:

Media manipulation, adaptation or conversion at an intermediate station in one way streaming for real-time multimedia communications	H04L 29/06503
Arrangements for reducing the amount or size of exchanged application data in the network	H04L 29/08783
Negotiation of resources in wireless networks	H04W 28/16

H04N 21/65

[N: transmission of management data between client and server]

Definition statement

This subclass/group covers:

High-level control signals.

H04N 21/654

[N: transmission by server directed to the client]

Definition statement

This subclass/group covers:

Server side Controlling. Described are here all the functions provided in a server for a high level control of the clients.

H04N 21/6543

[N: for forcing some client operations, e.g. recording (remote booting in general G06F9/445B8)]

Definition statement

This subclass/group covers:

A further category is related to the actions, which the server forces the client to execute. Meant are channel tuning, retrieving from cache and inserting, recording, retrieving OS software from a carousel and upgrading, generating monitoring data, activating a trigger.

References relevant to classification in this group

This subclass/group does not cover:

Remote booting in general	**G06F9/445B8**

H04N 21/6547

[N: comprising parameters, e.g. for client setup]

Definition statement

This subclass/group covers:

It includes the download of system parameters, such as for the decoder, the display of the graphical user interface, the setup (including OS software) of the client.

H04N 21/658

[N: transmission by the client directed to the server]

Definition statement

This subclass/group covers:

Client side Controlling. Nature of the uplink signal sent to the server.

H04N 21/6581

[N: Reference data, e.g. a movie identifier for ordering a movie or a product identifier in a home shopping application]

Definition statement

This subclass/group covers:

It can also transmit reference data such as an URL, for accessing a WWW page, a movie ID for ordering a movie, a product ID for a home shopping application.

H04N 21/6582

[N: Data stored in the client, e.g. viewing habits, hardware capabilities, credit card number (arrangements where receivers interact with the broadcast H04H 20/38)]

Definition statement

This subclass/group covers:

The client can transmit stored data, like viewing habits, hardware capabilities, credit card number.

References relevant to classification in this group

This subclass/group does not cover:

Arrangements where receivers interact with the broadcast	H04H 20/38

H04N 21/6583

[N: Acknowledgement]

Definition statement

This subclass/group covers:

The client responds to an action triggered by the server, for example confirms that a download was successful.

H04N 21/6587

[N: Control parameters, e.g. trick play commands, viewpoint selection]

Definition statement

This subclass/group covers:

The client sends parameters to control for example a VOD server (pause, fast-forward,..). Also includes viewpoint change, when an event is shot with different cameras.

H04N 21/80

[N: Generation or processing of content or additional data by content creator independently of the distribution process; Content per se (arrangements for generating broadcast information H04H 60/02)]

Definition statement

This subclass/group covers:

- Subject matter comprising video data and data related or unrelated thereto, generated by the content provider, wherein the defining feature is the presence of the data per se or processing operations to convert the data into a form suitable for the distribution process or to create an interactive application. This subgroup is directed to raw multimedia objects and processing operations thereof, wherein the operations involved are independent of the distribution process. The resulting data is then provided to the server for distribution purposes. Processing operations dependent of the distribution process are placed in H04N 21/20, H04N 21/60, H04N 21/40, according to the entity (respectively server, network, client) performing the operation.
- The first layer of this subgroup pertains to the nature of the raw multimedia content and covers e.g. video, audio, data, commercials, graphics and software.
- The second layer describes processing functions such as protecting the content by adding e.g. a watermark, certificate, signature, identification or defining content usage, or adding metadata or structuring the content, e.g. by decomposing it into layers, objects and segments.
- The next layer is directed to the assembling of the content, e.g. authoring of an interactive application. Examples of documents placed in the M-model (1) This subgroup is directed to the definition and generation of metadata. (2) This subgroup is directed to protection of rights and covers the identification of the source, content identification, rights specification (e.g. content can be displayed or copied within a certain time period or number of times and by a specific group of users) as well as adding certificates or calculating signatures. Scrambling of

the content for transmission purposes are classified elsewhere. Systems that describe the blocking of specific video content transmitted over a network is classified elsewhere. (3) This subgroup is directed towards high-level tools or processes to generate a multimedia application from basic components (such as compiling an interactive application to be run on a target STB). It pertains e.g. to the design of the scene graph, the generation of a trailer, of timestamps, the packaging of the content into an XML file and the linking of multimedia objects to URLs.

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for generating broadcast information	H04H 60/02
Compilation of EPG data containing metadata, also adding additional broadcast schedule data	H04N 21/26283

H04N 21/81

[N: Monomedia components thereof]

Definition statement

This subclass/group covers:

They are the basic monomedia components of multimedia content.Classifying these data types can be very useful to describe the kind of data processed in the system. This data will be distributed electronically later on (from a server to a client using a WAN, from the client to its peripherals using a LAN).

H04N 21/8106

[N: involving special audio data, e.g. different tracks for different languages]

Definition statement

This subclass/group covers:

Audio. The audio component is usually present and related to the video component. Therefore, this place must be restricted to non trivial aspects such as for example the presence of several tracks for different languages.

Example(s) of documents found in this subgroup: WO2005125205

H04N 21/8113

[N: comprising music, e.g. song in MP3 format]

Definition statement

This subclass/group covers:

Music, songs, MP3 files. Distinct from the audio track of a movie.

Example(s) of documents found in this subgroup:
US2005055722,US2004060070

H04N 21/812

[N: involving advertisement data (advertising per se G06Q30/00A)]

Definition statement

This subclass/group covers:

The commercial will be itself a monomedia or multimedia object but may be considered as an external element, which is added to the original content for commercial purposes.

Example(s) of documents found in this subgroup: US2007083887

References relevant to classification in this group

This subclass/group does not cover:

Advertising per se	**G06Q30/00A**

H04N 21/8126

[N: involving additional data, e.g. news, sports, stocks, weather forecasts]

Definition statement

This subclass/group covers:

Data should be provided as an extra service in the multimedia distribution system. It includes for example: stocks, sport results, news tickers or weather information.

Example(s) of documents found in this subgroup: US2005024236

References relevant to classification in this group

This subclass/group does not cover:

Operation of end-user applications for supplemental services	H04N 21/478

H04N 21/8133

[N: specifically related to the content, e.g. biography of the actors in a movie, detailed information about an article seen in a video program]

Definition statement

This subclass/group covers:

Additional data that are related to the multimedia content, e.g. biography of the actors in a movie, detailed information about an article seen in a video program, etc...but no program descriptors, in the sense of metadata.

H04N 21/814

[N: comprising emergency warnings (arrangements specially adapted for emergency or urgency in broadcast systems H04H 20/59; arrangements for providing alarms, notifications, alerts to substation in data switching networks H04L 12/1895)]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: US2008120639

References relevant to classification in this group

This subclass/group does not cover:

Arrangements specially adapted for emergency or urgency in broadcast systems	H04H 20/59
Arrangements for providing alarms, notifications, alerts to substation in data switching networks	H04L 12/1895

H04N 21/8146

[N: involving graphical data, e.g. 3D object, 2D graphics]

Definition statement

This subclass/group covers:

Graphical objects can be combined with video for example, like in MPEG-4. They can be of 2D or 3D nature. Text can also be considered as long as it is purely graphical and content of the textual information doesn't matter

Example(s) of documents found in this subgroup: WO2005013144

H04N 21/8153

[N: comprising still images, e.g. texture, background image]

Definition statement

This subclass/group covers:

Still images like texture, background or any other to be used in a menu should be classified here.

Example(s) of documents found in this subgroup: US2007154164

H04N 21/816

[N: involving special video data, e.g. 3D video]

Definition statement

This subclass/group covers:

- Video is the main component in the area of interactive television and will normally be present in all documents. This entry should be thus only used to describe further details.
- Motion vectors.

Example(s) of documents found in this subgroup: WO2008054384

H04N 21/8166

[N: involving executable data, e.g. software (arrangements for executing specific programs G06F 9/44; broadcasting computer programmes in broadcast systems H04H 20/91; movement of software or configuration parameters, in data networks H04L 29/08981)]

Definition statement

This subclass/group covers:

Executable code can be sent for example to distribute commercial packages or upgrades to clients.

Example(s) of documents found in this subgroup: WO0184824

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for executing specific programs	G06F 9/44
Broadcasting computer programmes in broadcast systems	H04H 20/91
Movement of software or configuration parameters, in data networks	H04L 29/08981

H04N 21/8173

[N: End-user applications, e.g. Web browser, game]

Definition statement

This subclass/group covers:

Meant are here high-level user applications such as a new browser, game to be run on the client only.

Example(s) of documents found in this subgroup: WO2006054865

H04N 21/818

[N: OS software]

Definition statement

This subclass/group covers:

Software module for the STB operating system.

Example(s) of documents found in this subgroup: US2004197073

H04N 21/8186

[N: specially adapted to be executed by a peripheral of the client device, e.g. by a reprogrammable remote control]

Definition statement

This subclass/group covers:

Software to be transmitted by the client to a peripheral such as PDA software. Covers also IR codes to reprogram a remote control.

Example(s) of documents found in this subgroup: US2002086734

H04N 21/8193

[N: dedicated tools, e.g. video decoder software or IPMP tool]

Definition statement

This subclass/group covers:

STB tools such as decoder software, Realplayer, Mediaplayer, IPMP tool.

Example(s) of documents found in this subgroup: EP1370083

H04N 21/83

[N: Generation or processing of protective or descriptive data associated with content; Content structuring]

Definition statement

This subclass/group covers:

Adding information Manipulating or adding information to the content to ensure its appropriate distribution.

H04N 21/835

[N: Generation of protective data, e.g. certificates (protecting software against unauthorised usage in a vending or licensing environment **G06F21/00N7**)]

Definition statement

This subclass/group covers:

Identification of the source (e.g. motion picture studio), content identification, rights specification as well as adding certificates or calculating signatures to guarantee the integrity of the content and the rights of its provider. Protection is added at the generation of the content, before it enters the distribution system.

Example(s) of documents found in this subgroup: US2006235800

References relevant to classification in this group

This subclass/group does not cover:

Protecting software against unauthorised usage in a vending or licensing environment	**G06F21/00N7**
Video stream encryption in the server	**H04N21/2437**

Video stream encryption in the client	H04N 21/4408

H04N 21/8352

[N: involving content or source identification data, e.g. Unique Material Identifier [UMID]]

Definition statement

This subclass/group covers:

The content receives an identification number, e.g. UMID, describing for example a video clip number, the source (motion picture studio) it comes from.

Example(s) of documents found in this subgroup: US2003005451

H04N 21/8355

[N: involving usage data, e.g. number of copies or viewings allowed]

Definition statement

This subclass/group covers:

- The content provider defines how his content has to be used, for example if it can be displayed or copied and how often and by which group of users. This information is processed for example by the client-side rights manager or on the server-side rights management.
- Covers also rental period of a movie.

Example(s) of documents found in this subgroup: US2005155079

H04N 21/83555

[N: using a structured language for describing usage rules of the content, e.g. REL]

Definition statement

This subclass/group covers:

Structured language for describing usage rules of the content (i.e. REL).

Example(s) of documents found in this subgroup: WO2006075904

H04N 21/8358

involving watermark [N: (protecting executable software by watermarking G06F21/00N7P2; image watermarking in general G06T 1/0021; watermarks inserted in still images for transmission purposes H04N 1/32144; inserting watermarks during video coding H04N 7/26372)]

Definition statement

This subclass/group covers:

A watermark is embedded in the content for later verification purposes.

Example(s) of documents found in this subgroup: WO2007122574

References relevant to classification in this group

This subclass/group does not cover:

Protecting executable software by watermarking	**G06F21/00N7P2**
Watermarks inserted in still images for transmission purposes	H04N 1/32144
Inserting watermarks during video coding	H04N 7/26372
Image watermarking in general	G06T 1/0021

H04N 21/84

[N: Generation or processing of descriptive data, e.g. content descriptors (systems specially adapted for using meta-information in broadcast systems H04H 60/73)]

Definition statement

This subclass/group covers:

- Program descriptors (abstract, actors,..) as video specific metadata defined in MPEG-7. As metadata is a widely used word in a large range of applications, attention should be paid not to classifiy here aspects like identificators, watermarks or additional data .
- Covers also program categories, reviews by other viewers and scene descriptors for MPEG-4 objects.

Example(s) of documents found in this subgroup: EP1496701

References relevant to classification in this group

This subclass/group does not cover:

Systems specially adapted for using meta-information in broadcast systems	H04H 60/73
Compilation of the EPG data as such by adding broadcast schedule data to metadata	H04N 21/26283
Supplemental data specifically related to the content	H04N 21/8133

H04N 21/8405

[N: represented by keywords]

Definition statement

This subclass/group covers:

Metadata is available as keywords for quicker matching.

Example(s) of documents found in this subgroup: EP1898325, WO2008032353

H04N 21/8402

[N: involving a version number, e.g. version number of EPG data (arrangements for version control in computers G06F9/44G4C)]

Definition statement

This subclass/group covers:

Version of the content, e.g. version of a software module.

Example(s) of documents found in this subgroup: DE102007002513

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for version control in computers	G06F9/44G4C

H04N 21/845

[N: Structuring of content, e.g. decomposing content into time segments]

Definition statement

This subclass/group covers:

Structuring of the content, for example by decomposing the content into layers, objects.

Example(s) of documents found in this subgroup: US2004047208

H04N 21/8451

[N: using Advanced Video Coding [AVC]]

Definition statement

This subclass/group covers:

This place is used to indicate the presence of video structured as in the new coding standard avc (advanced video coding), also referred to in the literature as jvt, H.264, H.26L, MPEG-4 part 10 (misleading name as the video is NOT coded in object form as in MPEG-4 generally the case).

Example(s) of documents found in this subgroup: EP1821537

H04N 21/8453

[N: by locking or enabling a set of features, e.g. optional functionalities in an executable program]

Definition statement

This subclass/group covers:

A piece of content has a set of features, which can be locked or enabled, e.g. optional functionalities in an executable program. Covers keyframes in video signals.

Example(s) of documents found in this subgroup: WO0045388, US2004073923

H04N 21/8455

[N: involving pointers to the content, e.g. pointers to the I-frames of the video stream]

Definition statement

This subclass/group covers:

Entry points in the video stream.

Example(s) of documents found in this subgroup: GB2441577

H04N 21/8456

[N: by decomposing the content in the time domain, e.g. in time segments]

Definition statement

This subclass/group covers:

A video stream is divided in time slices, like segments, scenes,..

Example(s) of documents found in this subgroup: US2007183756

H04N 21/85

[N: Assembly of content; Generation of multimedia applications]

Definition statement

This subclass/group covers:

Content assembly, performed typically by an operator on a work station in a production studio.

H04N 21/854

[N: Content Authoring]

Definition statement

This subclass/group covers:

Highlevel tools or processes to generate a multimedia application from basic components. It compiles for example multimedia descriptors (e.g. MHEG) into an interactive application to be run on target STBs.

Example(s) of documents found in this subgroup: US2003192049

H04N 21/85403

[N: by describing the content as an MPEG-21 Digital Item]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: WO2008038991

H04N 21/85406

[N: involving a specific file format, e.g. MP4 format]

Definition statement

This subclass/group covers:

Example(s) of documents found in this subgroup: US2004111677

H04N 21/8541

[N: involving branching, e.g. to different story endings]

Definition statement

This subclass/group covers:

An application has several subscenarios, allowing different story developments.

Example(s) of documents found in this subgroup: US2006064733

H04N 21/8543

[N: using a description language, e.g. Multimedia and Hypermedia information coding Expert Group [MHEG], eXtensible Markup Language [XML] (information retrieval of semistructured data, the underlying structure being taken into account, e.g. mark-up language structure data G06F 17/30908)]

Definition statement

This subclass/group covers:

Multimedia application described using a standard description language such as MHEG or XML.

Example(s) of documents found in this subgroup: US2009125938,EP1435738

References relevant to classification in this group

This subclass/group does not cover:

Information retrieval of semistructured data, the underlying structure being taken into account, e.g. mark-up language structure data	G06F 17/30908

H04N 21/8545

[N: for generating interactive applications]

Definition statement

This subclass/group covers:

Generation of scripts or executable (including applets) to make an application interactive.

Example(s) of documents found in this subgroup: US2003170004

H04N 21/8547

[N: involving timestamps for synchronizing content]

Definition statement

This subclass/group covers:

Describes the generation of timestamps for synchronizing different pieces of content such as video, audio or different objects.

Example(s) of documents found in this subgroup: US6976208

H04N 21/8549

[N: Creating video summaries, e.g. movie trailer (retrieval in video databases by using presentations in form of a video summary G06F17/30M5)]

Definition statement

This subclass/group covers:

Generation of a trailer (selected scenes from the original video) or any edited version from an original (including preview).

Example(s) of documents found in this subgroup: WO2005001715

References relevant to classification in this group

This subclass/group does not cover:

Retrieval in video databases by using presentations in form of a video summary	**G06F17/30M5**

H04N 21/858

[N: Linking data to content, e.g. by linking an URL to a video object, by creating a hotspot]

Definition statement

This subclass/group covers:

Reference between one of the component and anything else, like between 2 TV programs or a program and additional information on the internet (URL) or to shopping information. Covers also ATVEF triggers in general.

Example(s) of documents found in this subgroup: WO2008100069

H04N 21/8583

[N: by creating hot-spots]

Definition statement

This subclass/group covers:

Objects or regions of the visual content are associated to further resources, e.g. hypervideo. Excludes URLs. Covers details of marking regions of an image.

Example(s) of documents found in this subgroup: US2003149983

H04N 21/8586

[N: by using a URL (processing chained hypermedia data for information retrieval G06F17/30G4; information retrieval from the Internet by using URLs G06F 17/30876; URL in broadcast information H04H 20/93; protocols for network applications involving the use of web-based technology H04L 29/0809)]

Definition statement

This subclass/group covers:

Multimedia components are linked in the editing process to internet resource. with the WWW server. This place is used to describe the automatic access to a WWW server via an embedded URL.

Example(s) of documents found in this subgroup: EP1850594

References relevant to classification in this group

This subclass/group does not cover:

This group does not cover: Processing chained hypermedia data for information retrieval	**G06F17/30G4**
Information retrieval from the Internet by using URLs	G06F 17/30876

URL in broadcast information	H04H 20/93
Protocols for network applications involving the use of web-based technology	H04L 29/0809