CPC  COOPERATIVE PATENT CLASSIFICATION

G  PHYSICS
   (NOTES omitted)

INSTRUMENTS

G06  COMPUTING; CALCULATING; COUNTING
   (NOTES omitted)

G06F  ELECTRIC DIGITAL DATA PROCESSING (computer systems based on specific computational models G06N)

NOTE
In this subclass, the following terms or expressions are used with the meaning indicated:
- “handling” includes processing or transporting of data;
- “data processing equipment” means an association of an electric digital data processor classifiable under group G06F 7/00, with one or more arrangements classifiable under groups G06F 1/00 - G06F 5/00 and G06F 9/00 - G06F 13/00.

WARNINGS
1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
   - G06F 3/18 covered by G06F 3/00, G06K 11/00
   - G06F 7/04 covered by G06F 7/02
   - G06F 9/302 - G06F 9/318 covered by G06F 9/30

2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00  Details not covered by groups G06F 3/00 - G06F 13/00 and G06F 21/00 (architectures of general purpose stored program computers G06F 15/76)

1/02  .  Digital function generators { (evaluating functions by calculating only G06F 7/544, G06F 7/60; generating sawtooth or staircase waveforms H03K 4/00) }

1/022  .  [Waveform generators, i.e. devices for generating periodical functions of time, e.g. direct digital synthesizers (G06F 1/025, G06F 1/03 take precedence)]

1/025  .  for functions having two-valued amplitude, e.g. Walsh functions {(generation of pulse trains in general H03K 3/00) }

1/0255  .  [Walsh or analogous functions]

1/03  .  working, at least partly, by table look-up (G06F 1/025 takes precedence)

NOTE
In order to be classified in this group, the table must contain function values of the desired or an intermediate function, not merely coefficients.

1/0307  .  [Logarithmic or exponential functions (G06F 1/0314, G06F 1/035 take precedence)]

1/0314  .  [the table being stored on a peripheral device, e.g. papertape, drum]

1/0321  .  [Waveform generators, i.e. devices for generating periodical functions of time, e.g. direct digital synthesizers (G06F 1/0314, G06F 1/035 take precedence)]

1/0328  .  .  .  .  [in which the phase increment is adjustable, e.g. by using an adder-accumulator]

1/0335  .  .  .  .  [the phase increment itself being a composed function of two or more variables, e.g. frequency and phase]

1/0342  .  .  .  .  [for generating simultaneously two or more related waveforms, e.g. with different phase angles only]

1/035  .  .  .  Reduction of table size {(G06F 1/0314 takes precedence) }

1/0353  .  .  .  .  [by using symmetrical properties of the function, e.g. using most significant bits for quadrant control]

1/0356  .  .  .  .  [by using two or more smaller tables, e.g. addressed by parts of the argument]

1/04  .  Generating or distributing clock signals or signals derived directly therefrom

1/06  .  .  Clock generators producing several clock signals {(G06F 1/08 - G06F 1/14 take precedence) }

1/08  .  .  Clock generators with changeable or programmable clock frequency

1/10  .  .  Distribution of clock signals {, e.g. skew}

1/105  .  .  .  .  [in which the distribution is at least partially optical]

1/12  .  .  Synchronisation of different clock signals {provided by a plurality of clock generators}

1/14  .  .  Time supervision arrangements, e.g. real time clock

1/16  .  .  Constructional details or arrangements
[Multi-choice questions]

I/1601 . . . (Constructional details related to the housing of computer displays, e.g. of CRT monitors, or flat displays (constructional details related to flat displays integrated in a portable computer, e.g. laptop, handheld computer G06F 1/1637; constructional details related to television receivers H04N 5/64))

I/1603 . . . . (Arrangements to protect the display from incident light, e.g. hoods)

I/1605 . . . . (Multimedia displays, e.g. with integrated or attached speakers, cameras, microphones)

I/1607 . . . . (Arrangements to support accessories mechanically attached to the display housing (G06F 1/1603, G06F 1/1605 take precedence))

I/1609 . . . . (to support filters or lenses)

I/1611 . . . . (to support document holders)

I/1613 . . . . (for portable computers (cooling arrangements therefor G06F 1/203; constructional details or arrangements for pocket calculators, electronic agendas or books G06F 15/0216; constructional details of portable telephone sets: with several bodies H04N 1/0720))

I/1615 . . . . (with several enclosures having relative motions, each enclosure supporting at least one I/O or computing function (constructional details of portable telephones comprising a plurality of mechanically joined movable body parts H04M 1/0206))

I/1616 . . . . (with folding flat displays, e.g. laptop computers or notebooks having a clamshell configuration, with body parts pivoting to an open position around an axis parallel to the plane they define in closed position)

I/1618 . . . . (the display being foldable up to the back of the other housing with a single degree of freedom, e.g. by 360° rotation over the axis defined by the rear edge of the base enclosure)

I/162 . . . . (changing, e.g. reversing, the face orientation of the screen with a two degrees of freedom mechanism, e.g. for folding into tablet PC like position or orienting towards the direction opposite to the user to show to a second user)

I/1622 . . . . (with enclosures rotating around an axis perpendicular to the plane they define or with ball-joint coupling, e.g. PDA with display enclosure orientation changeable between portrait and landscape by rotation with respect to a coplanar body enclosure)

I/1624 . . . . (with sliding enclosures, e.g. sliding keyboard or display)

I/1626 . . . . (with a single-body enclosure integrating a flat display, e.g. Personal Digital Assistants [PDAs])

I/1628 . . . . (Carrying enclosures containing additional elements, e.g. case for a laptop and a printer)

I/163 . . . . (Wearable computers, e.g. on a belt)

I/1632 . . . . (External expansion units, e.g. docking stations)

I/1633 . . . . (Constructional details or arrangements of portable computers not specific to the type of enclosures covered by groups G06F 1/1615 - G06F 1/1626)

I/1635 . . . . (Details related to the integration of battery packs and other power supplies such as fuel cells or integrated AC adapter (details of mounting batteries in general H01M 2/1023))

I/1637 . . . . (Details related to the display arrangement, including those related to the mounting of the display in the housing (constructional details related to the housing of computer displays in general G06F 1/1601))

I/1639 . . . . (the display being based on projection)

I/1641 . . . . (the display being formed by a plurality of foldable display components (G06F 1/1647 takes precedence))

I/1643 . . . . (the display being associated to a digitizer, e.g. laptops that can be used as pending (touchpads integrated in a laptop or similar computer G06F 1/1609; secondary touch screen G06F 1/1602; details related to the relative motion of the display enclosure with respect to the body enclosure, e.g. to move between laptop and tablet PC configuration G06F 1/1615))

I/1645 . . . . (the display being suitable to be used in combination with an external overhead projector)

I/1647 . . . . (including at least an additional display (G06F 1/1602 takes precedence))

I/1649 . . . . (the additional display being independently orientable, e.g. for presenting information to a second user)

I/165 . . . . . (the additional display being small, e.g. for presenting status information)

I/1652 . . . . (the display being flexible, e.g. mimicking a sheet of paper, or rollable)

I/1654 . . . . (the display being detachable, e.g. for remote use)

I/1656 . . . (Details related to functional adaptations of the enclosure, e.g. to provide protection against EMI, shock, water, or to host detachable peripherals like a mouse or removable expansions units like PCMCIA cards, or to provide access to internal components for maintenance or to removable storage supports like CDs or DVDs, or to mechanically mount accessories (mounting of accessories to a computer display G06F 1/1607; display hoods G06F 1/1603; cooling arrangements for portable computers G06F 1/203))

I/1658 . . . . (related to the mounting of internal components, e.g. disc drive or any other functional module)

I/166 . . . . (related to integrated arrangements for adjusting the position of the main body with respect to the supporting surface, e.g. legs for adjusting the tilt angle)

I/1662 . . . . (Details related to the integrated keyboard)

I/1664 . . . (Arrangements for ergonomically adjusting the disposition of keys of the integrated keyboard)
G06F

1/166  . . . . (Arrangements for reducing the size of the integrated keyboard for transport, e.g. foldable keyboards, keyboards with collapsible keys (G06F 1/1664 takes precedence))

1/167  . . . . (Arrangements for adjusting the tilt angle of the integrated keyboard independently from the main body (adjusting the tilt angle integrally with the main body G06F 1/166))

1/169  . . . . (Detachable keyboards)

1/1671 . . . . (Special purpose buttons or auxiliary keyboards, e.g. retractable mini keypads, keypads or buttons that remain accessible at closed laptop (G06F 1/1666 takes precedence))

1/1673 . . . . (Arrangements for projecting a virtual keyboard)

1/1675 . . . . (Miscellaneous details related to the relative movement between the different enclosures or enclosure parts which could be adopted independently from the movement typologies specified in G06F 1/1615 and subgroups)

1/1677 . . . . (for detecting open or closed state or particular intermediate positions assumed by movable parts of the enclosure, e.g. detection of display lid position with respect to main body in a laptop, detection of opening of the cover of battery compartment)

1/1679 . . . . (for locking or maintaining the movable parts of the enclosure in a fixed position, e.g. latching mechanism at the edge of the display in a laptop or for the screen protective cover of a PDA (G06F 1/1681 takes precedence))

1/1681 . . . . (Details related solely to hinges (hinge details related to the transmission of signals or power are classified in G06F 1/1683))

1/1683 . . . . (for the transmission of signal or power between the different housings, e.g. details of wired or wireless communication, passage of cabling)

1/1684 . . . . (Constructional details or arrangements related to integrated I/O peripherals not covered by groups G06F 1/1635 - G06F 1/1675)

1/1686 . . . . (the I/O peripheral being an integrated camera)

1/1688 . . . . (the I/O peripheral being integrated loudspeakers)

1/169 . . . . (the I/O peripheral being an integrated pointing device, e.g. trackball in the palm rest area, mini-joystick integrated between keyboard keys, touch pads or touch stripes (G06F 1/1643 takes precedence; constructional details of pointing devices G06F 3/033: joysticks in general G05G 9/047))

1/1692 . . . . (the I/O peripheral being a secondary touch screen used as control interface, e.g. virtual buttons or sliders)

1/1694 . . . . (the I/O peripheral being a single or a set of motion sensors for pointer control or gesture input obtained by sensing movements of the portable computer)

1/1696 . . . . (the I/O peripheral being a printing or scanning device)

1/1698 . . . . (the I/O peripheral being a sending/receiving arrangement to establish a cordless communication link, e.g. radio or infrared link, integrated cellular phone (details of antennas disposed inside a computer H01Q 1/2266))

1/18 . . . . Packaging or power distribution (for electrical apparatus in general H05K, H02J)

1/181 . . . . (Enclosures (for electric apparatus in general H05K 5/00; for portable computers G06F 1/1613))

1/182 . . . . (with special features, e.g. for use in industrial environments: grounding or shielding against radio frequency interference [RFI] or electromagnetical interference [EMI] (in general H05K 9/00))

1/183 . . . . (Internal mounting support structures, e.g. for printed circuit boards (in general H05K 7/1422), internal connecting means (for buses G06F 13/409))

1/184 . . . . (Mounting of motherboards (in general H05K 7/1429))

1/185 . . . . (Mounting of expansion boards (in general H05K 7/1417))

1/186 . . . . (Securing of expansion boards in correspondence to slots provided at the computer enclosure (in general H05K 7/1402))

1/187 . . . . (Mounting of fixed and removable disk drives (constructional details of disk drives housings in general G11B 33/00))

1/188 . . . . (Mounting of power supply units (power supply for computers, per se G06F 1/26))

1/189 . . . . (Power distribution)

1/20 . . . . Cooling means

1/203 . . . . (for portable computers, e.g. for laptops)

1/206 . . . . (comprising thermal management)

1/22 . . . . Means for limiting or controlling the pin/gate ratio

1/24 . . . . Resetting means

1/26 . . . . Power supply means, e.g. regulation thereof (for memories G11C)

1/263 . . . . (Arrangements for using multiple switchable power supplies, e.g. battery and AC (G06F 1/30 takes precedence))

1/266 . . . . (Arrangements to supply power to external peripherals either directly from the computer or under computer control, e.g. supply of power through the communication port, computer controlled power-strips)

1/28 . . . . Supervision thereof, e.g. detecting power-supply failure by out of limits supervision

1/30 . . . . Means for acting in the event of power-supply failure or interruption, e.g. power-supply fluctuations (for resetting only G06F 1/24)

1/305 . . . . (in the event of power-supply fluctuations)

1/32 . . . . Means for saving power

1/3203 . . . . Power management, i.e. event-based initiation of power-saving mode
I/3206 . . . . Monitoring of events, devices or parameters that trigger a change in power modality
I/3209 . . . . Monitoring remote activity, e.g. over telephone lines or network connections
I/3212 . . . . Monitoring battery levels, e.g. power saving mode being initiated when battery voltage goes below a certain level
I/3215 . . . . Monitoring of peripheral devices
I/3218 . . . . . of display devices
I/3221 . . . . . of disk drive devices
I/3225 . . . . . of memory devices
I/3228 . . . . . Monitoring task completion, e.g. by use of idle timers, stop commands or wait commands
I/3231 . . . . . Monitoring the presence, absence or movement of users
I/3234 . . . . . Power saving characterised by the action undertaken
I/3237 . . . . . by disabling clock generation or distribution
I/324 . . . . . by lowering clock frequency
I/3243 . . . . . {Power saving in microcontroller unit}
I/3246 . . . . . by software initiated power-off
I/325 . . . . . {Power saving in peripheral device}
I/3253 . . . . . {Power saving in bus}
I/3256 . . . . . {Power saving in optical drive}
I/3259 . . . . . {Power saving in cursor control device, e.g. mouse, joystick, trackball}
I/3262 . . . . . {Power saving in digitizer or tablet}
I/3265 . . . . . {Power saving in display device}
I/3268 . . . . . {Power saving in hard disk drive}
I/3271 . . . . . {Power saving in keyboard}
I/3275 . . . . . {Power saving in memory, e.g. RAM, cache}
I/3278 . . . . . {Power saving in modem or I/O interface}
I/3281 . . . . . {Power saving in PCMCIA card}
I/3284 . . . . . {Power saving in printer}
I/3287 . . . . . by switching off individual functional units in the computer system
I/329 . . . . . by task scheduling
I/3293 . . . . . by switching to a less power-consuming processor, e.g. sub-CPU
I/3296 . . . . . by lowering the supply or operating voltage

3/00 Input arrangements for transferring data to be processed into a form capable of being handled by the computer; Output arrangements for transferring data from processing unit to output unit, e.g. interface arrangements (typewriters B41F; conversion of physical variables P13B 5/00; G01; image acquisition G06F 1/00; G06F 9/00; coding, decoding or code conversion in general H03M; transmission of digital information H04L; {in regulating or control systems G05B})

3/002 . . . {Specific input/output arrangements not covered by G06F 3/02 - G06F 3/16, e.g. facsimile, microfilm (facsimile per se H04N 1/00; viewers photographic printing G03B; electrography, magnetography G03G; other optical apparatus G02B 27/00)}

3/007 . . . . {Digital input from or digital output to memories of the shift register type, e.g. magnetic bubble memories, CCD memories (magnetic bubble memories per se G11C 19/08, CCD memories per se G11C 19/28)}

3/01 . . . . Input arrangements or combined input and output arrangements for interaction between user and computer (G06F 3/16 takes precedence)

3/011 . . . . {Arrangements for interaction with the human body, e.g. for user immersion in virtual reality (for handicapped people in general A61F 4/00; robot control B25F; tactile signalling G08B; blind teaching G09B 21/00; for electrophonic musical instruments G10H 1/444; electronic switches characterised by the way in which the control signals are generated H03K 17/94)}

3/012 . . . . {Head tracking input arrangements}

3/013 . . . . {Eye tracking input arrangements (G06F 3/015 takes precedence)}

3/014 . . . . {Hand-worn input/output arrangements, e.g. data gloves}

3/015 . . . . {Input arrangements based on nervous system activity detection, e.g. brain waves [EEG] detection, electromyograms [EMG] detection, electrodermal response detection}

3/016 . . . . {Input arrangements with force or tactile feedback as computer generated output to the user}

3/017 . . . . {Gesture based interaction, e.g. based on a set of recognized hand gestures (interaction based on gestures traced on a digitiser G06F 3/04883)}

3/018 . . . . {Input/output arrangements for oriental characters}

3/02 . . . . Input arrangements using manually operated switches, e.g. using keyboards or dials (keyboard switches per se H01H 13/70; electronic switches characterised by the way in which the control signals are generated H03K 17/94)

3/0202 . . . . {Constructional details or processes of manufacture of the input device}

3/0205 . . . . {Lever arrangements for operating keyboard cursor control keys in a joystick-like manner}

3/0208 . . . . {Arrangements for adjusting the tilt angle of a keyboard, e.g. pivoting legs (for keyboards integrated in a laptop computer G06F 1/1667)}

3/021 . . . . {Arrangements integrating additional peripherals in a keyboard, e.g. card or barcode reader, optical scanner}

3/0213 . . . . {Arrangements providing an integrated pointing device in a keyboard, e.g. trackball, mini-joystick (for pointing devices integrated in a laptop computer G06F 1/169; joysticks G05G 9/047; constructional details of pointing devices G06F 3/033)}

3/0216 . . . . {Arrangements for ergonomically adjusting the disposition of keys of a keyboard (for keyboards integrated in a laptop computer G06F 1/1664)}

3/0219 . . . . {Special purpose keyboards}
3/0221 . . . [Arrangements for reducing keyboard size for transport or storage, e.g. foldable keyboards, keyboards with collapsible keys (G06F 3/0216 takes precedence; for keyboards integrated in a laptop computer G06F 1/1666)]

3/0224 . . . [Key guide holders]

3/0227 . . . [Cooperation and interconnection of the input arrangement with other functional units of a computer (G06F 3/023 - G06F 3/037 take precedence)]

3/023 . . . Arrangements for converting discrete items of information into a coded form, e.g. arrangements for interpreting keyboard generated codes as alphanumeric codes, operand codes or instruction codes (coding in connection with keyboards or like devices in general H03M 11/00)]

3/0231 . . . [Cordless keyboards]

3/0232 . . . [Manual direct entries, e.g. key to main memory]

3/0233 . . . [Character input methods]

3/0234 . . . [using switches operable in different directions]

3/0235 . . . [using chord techniques (G06F 3/0234 takes precedence)]

3/0236 . . . [using selection techniques to select from displayed items]

3/0237 . . . [Programmable keyboards (key guide holders G06F 3/0224)]

3/027 . . . for insertion of decimal point (display of decimal point G06F 3/1407; complete desktop or hand-held calculators G06F 15/02)]

3/03 . . . Arrangements for converting the position or the displacement of a member into a coded form

**NOTE**

In this group, the first place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.


3/0308 . . . [comprising a plurality of distinctive and separately oriented light emitters or reflectors associated to the pointing device, e.g. remote cursor controller with distinct and separately oriented LEDs at the tip whose radiations are captured by a photo-detector associated to the screen]

3/0312 . . . [for tracking the rotation of a spherical or circular member, e.g. optical rotary encoders used in mice or trackballs using a tracking ball or in mouse scroll wheels (tracking relative movement in co-operation with a regularly or irregularly patterned surface, e.g. as in optical mice G06F 3/0317; constructional details of scroll or thumb-wheels G06F 3/0362; optical rotary encoders G01D 5/3473; thumb wheel switches H01H 19/00)]

3/0317 . . . [in co-operation with a patterned surface, e.g. absolute position or relative movement detection for an optical mouse or pen positioned with respect to a coded surface]

3/0321 . . . [by optically sensing the absolute position with respect to a regularly patterned surface forming a passive digitiser, e.g. pen optically detecting position indicative tags printed on a paper sheet (constructional details of pen-shaped pointing devices G06F 3/03545, G06F 3/03542, G06F 3/0373)]

3/0325 . . . [using a plurality of light emitters or reflectors or a plurality of detectors forming a reference frame from which to derive the orientation of the object, e.g. by triangulation or on the basis of reference deformation in the picked up image]

3/033 . . . Pointing devices displaced or positioned by the user, e.g. mice, trackballs, pens or joysticks; Accessories therefor (constructional details of joysticks G05G 9/047; arrangement for interfacing a joystick to a computer G06F 3/038)]

3/0334 . . . [Foot operated pointing devices]

3/0338 . . . [with detection of limited linear or angular displacement of an operating part of the device from a neutral position, e.g. isotonic or isometric joysticks]

3/0346 . . . [with detection of the device orientation or free movement in a 3D space, e.g. 3D mice, 6-DOF six degrees of freedom) pointers using gyroscopes, accelerometers or tilt-sensors]

3/0354 . . . [with detection of 2D relative movements between the device, or an operating part thereof, and a plane or surface, e.g. 2D mice, trackballs, pens or pucks]

3/03541 . . . [Mouse/trackball convertible devices, in which the same ball is used to track the 2D relative movement]

3/03542 . . . [Light pens for emitting or receiving light]

3/03543 . . . [Mice or pucks (G06F 3/03541 takes precedence)]

3/03544 . . . [having dual sensing arrangement, e.g. two balls or two coils used to track rotation of the pointing device]

3/03545 . . . [Pens or stylus]

3/03546 . . . [using a rotatable ball at the tip as position detecting member]

3/03547 . . . [Touch pads, in which fingers can move on a surface]
3/03548 . . . . (Sliders, in which the moving part moves in a plane)

3/03549 . . . . (Trackballs (G06F 3/0341 takes precedence))

3/0362 . . . . with detection of 1D translations or rotations of an operating part of the device, e.g. scroll wheels, sliders, knobs, rollers or belts

3/037 . . . . using the raster scan of a cathode-ray tube [CRT] for detecting the position of the member, e.g. light pens cooperating with CRT monitors

3/038 . . . . Control and interface arrangements therefor, e.g. drivers or device-embedded control circuitry

3/0383 . . . . [Signal control means within the pointing device]

3/0386 . . . . [for light pen]

3/039 . . . . Accessories therefor, e.g. mouse pads

**WARNING**

Group G06F 3/039 is impacted by reclassification into group G06F 3/0393. Groups G06F 3/039 and G06F 3/0393 should be considered in order to perform a complete search.

3/0393 . . . . Accessories for touch pads or touch screens, e.g. mechanical guides added to touch screens for drawing straight lines, hard keys overlaying touch screens or touch pads

**WARNING**

Group G06F 3/0393 is impacted by reclassification into group G06F 3/0393. Groups G06F 3/039 and G06F 3/0393 should be considered in order to perform a complete search.

3/0395 . . . . Mouse pads

3/041 . . . . Digitisers, e.g. for touch screens or touch pads, characterised by the transducing means

3/0412 . . . . Digitisers structurally integrated in a display

3/0414 . . . . using force sensing means to determine a position

**WARNING**

Group G06F 3/0414 is impacted by reclassification into groups G06F 3/04142, G06F 3/04144 and G06F 3/04146. All groups listed in this Warning should be considered in order to perform a complete search.

3/0416 . . . . Control or interface arrangements specially adapted for digitisers

**WARNING**

Group G06F 3/0416 is impacted by reclassification into groups G06F 3/04162, G06F 3/04164, G06F 3/04166, G06F 3/041661, and G06F 3/041662. All groups listed in this Warning should be considered in order to perform a complete search.

3/04162 . . . . for exchanging data with external devices, e.g. smart pens, via the digitiser sensing hardware

**WARNING**

Group G06F 3/04162 is impacted by reclassification of documents from group G06F 3/0414.

Groups G06F 3/0414 and G06F 3/04142 should be considered in order to perform a complete search.

3/04144 . . . . using an array of force sensing means (position sensing using the local deformation of sensor cells G06F 3/0447)

**WARNING**

Group G06F 3/04144 is impacted by reclassification of documents from group G06F 3/0414.

Groups G06F 3/0414 and G06F 3/04144 should be considered in order to perform a complete search.

3/04146 . . . . using pressure sensitive conductive elements delivering a boolean signal and located between crossing sensing lines, e.g. located between X and Y sensing line layers

**WARNING**

Group G06F 3/04146 is impacted by reclassification of documents from group G06F 3/0414.

Groups G06F 3/0414 and G06F 3/04146 should be considered in order to perform a complete search.
3/04164 . . . . {Connections between sensors and controllers, e.g. routing lines between electrodes and connection pads}

**WARNING**

Group G06F 3/04164 is incomplete pending reclassification of documents from groups G06F 3/0416, G06F 3/0416 and G06F 3/04164 should be considered in order to perform a complete search.

3/04166 . . . . {Details of scanning methods, e.g. sampling time, grouping of sub areas or time sharing with display driving (Synchronisation with the driving of the display or the backlighting unit to avoid interferences generated internally G06F 3/04184)}

**WARNING**

Group G06F 3/04166 is incomplete pending reclassification of documents from group G06F 3/0416. Groups G06F 3/0416 and G06F 3/04166 should be considered in order to perform a complete search.

3/041661 . . . . {using detection at multiple resolutions, e.g. coarse and fine scanning; using detection within a limited area, e.g. object tracking window}

**WARNING**

Group G06F 3/041661 is incomplete pending reclassification of documents from group G06F 3/0416. Groups G06F 3/0416 and G06F 3/04166 should be considered in order to perform a complete search.

3/041662 . . . . {using alternate mutual and self-capacitive scanning}

**WARNING**

Group G06F 3/041662 is incomplete pending reclassification of documents from group G06F 3/0416. Groups G06F 3/0416 and G06F 3/041662 should be considered in order to perform a complete search.

3/0418 . . . . {for error correction or compensation, e.g. based on parallax, calibration or alignment}

**WARNING**

Group G06F 3/0418 is impacted by reclassification into groups G06F 3/04182, G06F 3/04184, and G06F 3/04186. All groups listed in this Warning should be considered in order to perform a complete search.

3/04182 . . . . {Filtering of noise external to the device and not generated by digitiser components}

**WARNING**

Group G06F 3/04182 is incomplete pending reclassification of documents from group G06F 3/0418. Groups G06F 3/0418 and G06F 3/04182 should be considered in order to perform a complete search.

3/04184 . . . . {Synchronisation with the driving of the display or the backlighting unit to avoid interferences generated internally}

**WARNING**

Group G06F 3/04184 is incomplete pending reclassification of documents from group G06F 3/0418. Groups G06F 3/0418 and G06F 3/04184 should be considered in order to perform a complete search.

3/04186 . . . . {Touch location disambiguation}

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3/042 . . . . by opto-electronic means

3/0421 . . . . {by interrupting or reflecting a light beam, e.g. optical touch-screen}

3/0423 . . . . {using sweeping light beams, e.g. using rotating or vibrating mirror}

3/0425 . . . . {using a single imaging device like a video camera for tracking the absolute position of a single or a plurality of objects with respect to an imaged reference surface, e.g. video camera imaging a display or a projection screen, a table or a wall surface, on which a computer generated image is displayed or projected (tracking a projected light spot to determine a position on a display surface G06F 3/0386)}

3/0426 . . . . {tracking fingers with respect to a virtual keyboard projected or printed on the surface (virtual keyboards on touch screens G06F 3/0486)}

3/0428 . . . . {by sensing at the edges of the touch surface the interruption of optical paths, e.g. an illumination plane, parallel to the touch surface which may be virtual (sensing beam interruptions in a planar beam grid of an optical touch-screen G06F 3/0421)}

3/043 . . . . using propagating acoustic waves
1. This group covers subject matter where the focus is placed on the way the user can interact with the displayed data. The mere presence of a standard GUI in the context of the disclosure of a specific software application or a specific device capable of processing data related to its specific function, should be in general classified in the appropriate subclasses related to those software applications or specific devices.

2. In this group, multi-aspect classification is applied, so that subject matter characterised by aspects covered by more than one of its groups, which is considered to represent information of interest for search, should be classified in each of those groups.
3/04892 . . . . . . . (Arrangements for controlling cursor position based on codes indicative of cursor displacements from one discrete location to another, e.g. using cursor control keys associated to different directions or using the tab key (arrangements for controlling cursor position based on coordinate signals G06F 9/033))

3/04895 . . . . . . . (Guidance during keyboard input operation, e.g. prompting (help systems G06F 9/453))

3/04897 . . . . . . . (Special input arrangements or commands for improving display capability)

3/05 . Digital input using the sampling of an analogue quantity at regular intervals of time (input from a/d converter or output to d/a converter)

3/06 . Digital input from or digital output to record carriers, (e.g. RAID, emulated record carriers, networked record carriers (recording or reproducing devices per se G11B; error detection, error correction, monitoring per se regarding storage systems G06F 11/00; accessing or addressing within memory systems or architectures G06F 12/00; information retrieval G06F 16/00))

3/0601 . . . . [Dedicated interfaces to storage systems]

3/0602 . . . . . [specifically adapted to achieve a particular effect]

3/0604 . . . . . . . [Improving or facilitating administration, e.g. storage management]

3/0605 . . . . . . . (by facilitating the interaction with a user or administrator)

3/0607 . . . . . . . (by facilitating the process of upgrading existing storage systems, e.g. for improving compatibility between host and storage device)

3/0608 . . . . . . . [Saving storage space on storage systems]

3/061 . . . . . . . [Improving I/O performance]

3/0611 . . . . . . . (in relation to response time)

3/0613 . . . . . . . (in relation to throughput)

3/0614 . . . . . . . [Improving the reliability of storage systems]

3/0616 . . . . . . . (in relation to life time, e.g. increasing Mean Time Between Failures [MTBF])

3/0617 . . . . . . . (in relation to availability)

3/0619 . . . . . . . (in relation to data integrity, e.g. data losses, bit errors)

3/062 . . . . . . . [Securing storage systems]

3/0622 . . . . . . . (in relation to access)

3/0623 . . . . . . . (in relation to content)

3/0625 . . . . . . . [Power saving in storage systems]

3/0626 . . . . . . . [Reducing size or complexity of storage systems]

3/0628 . . . . . . . [making use of a particular technique]

3/0629 . . . . . . . [Configuration or reconfiguration of storage systems]

3/0631 . . . . . . . (by allocating resources to storage systems)

3/0632 . . . . . . . (by initialisation or re-initialisation of storage systems)

3/0634 . . . . . . . (by changing the state or mode of one or more devices)

3/0635 . . . . . . . (by changing the path, e.g. traffic rerouting, path reconfiguration)

3/0637 . . . . . . . [Permissions]

3/0638 . . . . . . . [Organizing or formatting or addressing of data]

3/064 . . . . . . . [Management of blocks]

3/0641 . . . . . . . [De-duplication techniques]

3/0643 . . . . . . . [Management of files]

3/0644 . . . . . . . [Management of space entities, e.g. partitions, extents, pools]

3/0646 . . . . . . . [Horizontal data movement in storage systems, i.e. moving data in between storage devices or systems]

3/0647 . . . . . . . [Migration mechanisms]

3/0649 . . . . . . . [Lifecycle management]

3/065 . . . . . . . [Replication mechanisms]

3/0652 . . . . . . . (Erasing, e.g. deleting, data cleaning, moving of data to a wastebasket)

3/0653 . . . . . . . [Monitoring storage devices or systems]

3/0655 . . . . . . . [Vertical data movement, i.e. input-output transfer; data movement between one or more hosts and one or more storage devices]

3/0656 . . . . . . . [Data buffering arrangements]

3/0658 . . . . . . . [Controller construction arrangements]

3/0659 . . . . . . . [Command handling arrangements, e.g. command buffers, queues, command scheduling]

3/0661 . . . . . . . [Format or protocol conversion arrangements]

3/0662 . . . . . . . [Virtualisation aspects]

3/0664 . . . . . . . [at device level, e.g. emulation of a storage device or system]

3/0665 . . . . . . . [at area level, e.g. provisioning of virtual or logical volumes]

3/0667 . . . . . . . [at data level, e.g. file, record or object virtualisation]

3/0668 . . . . . . . [adopting a particular infrastructure]

3/067 . . . . . . . [Distributed or networked storage systems, e.g. storage area networks [SAN], network attached storage [NAS]]

3/0671 . . . . . . . [In-line storage system]

3/0673 . . . . . . . [Single storage device]

3/0674 . . . . . . . [Disk device]

3/0676 . . . . . . . [Magnetic disk device]

3/0677 . . . . . . . [Optical disk device, e.g. CD-ROM, DVD]

3/0679 . . . . . . . [Non-volatile semiconductor memory device, e.g. flash memory, one time programmable memory [OTP]]

3/068 . . . . . . . [Hybrid storage device]

3/0682 . . . . . . . [Tape device]

3/0683 . . . . . . . [Plurality of storage devices]

3/0685 . . . . . . . [Hybrid storage combining hierarchical device types, e.g. storage arrays]

3/0686 . . . . . . . [Libraries, e.g. tape libraries, jukebox]

3/0688 . . . . . . . [Non-volatile semiconductor memory arrays]

3/0689 . . . . . . . [Disk arrays, e.g. RAID, JBOD]

2003/0691 . . . . . . . [buffering arrangements]

2003/0692 . . . . . . . [digital I/O from or to direct access storage devices, e.g. magnetic, optical, magneto-optical disc]

2003/0694 . . . . . . . [emulating arrangements, e.g. RAM-disc]

2003/0695 . . . . . . . [formatting arrangements]
Digital output to print unit, e.g. line printer, chain printer

3/1201 [Dedicated interfaces to print systems]

3/1202 [specifically adapted to achieve a particular effect]

3/1203 [Improving or facilitating administration, e.g. print management]

3/1204 [resulting in reduced user or operator actions, e.g. presetting, automatic actions, using hardware token storing data]

3/1205 [resulting in increased flexibility in print job configuration, e.g. job settings, print requirements, job tickets]

3/1206 [resulting in increased flexibility in input data format or job format or job type]

3/1207 [resulting in the user being informed about print result after a job submission]

3/1208 [resulting in improved quality of the output result, e.g. print layout, colours, workflows, print preview]

3/1209 [resulting in adapted or bridged legacy communication protocols, e.g. emulation, protocol extension]

3/121 [Facilitating exception or error detection and recovery, e.g. fault, media or consumables depleted]

3/1211 [Improving printing performance]

3/1212 [achieving reduced delay between job submission and print start]

3/1213 [at an intermediate node or at the final node]

3/1214 [at the submitting node]

3/1215 [achieving increased printing speed, i.e. reducing the time between printing start and printing end]

3/1217 [achieving reduced idle time at the output device or increased asset utilization]

3/1218 [Reducing or saving of used resources, e.g. avoiding waste of consumables or improving usage of hardware resources]

3/1219 [with regard to consumables, e.g. ink, toner, paper]

3/122 [with regard to computing resources, e.g. memory, CPU]

3/1221 [with regard to power consumption]

3/1222 [Increasing security of the print job]

3/1223 [specifically adapted to use a particular technique]

3/1224 [Client or server resources management]

3/1225 [Software update, e.g. print driver, modules, plug-ins, fonts]

3/1226 [Discovery of devices having required properties]

3/1227 [Printer definition files]

3/1228 [Printing driverless or using generic drivers]

3/1229 [Printer resources management or printer maintenance, e.g. device status, power levels]

3/123 [Software or firmware update, e.g. device firmware management]

3/1231 [Device related settings, e.g. IP address, Name, Identification]

3/1232 [Transmitting printer device capabilities, e.g. upon request or periodically]

3/1234 [Errors handling and recovery, e.g. reprinting (G06F 3/1261 takes precedence)]

3/1235 [caused by end of consumables, e.g. paper, ink, toner]

3/1236 [Connection management]

3/1237 [Print job management]

3/1238 [Secure printing, e.g. user identification, user rights for device usage, unallowed content, blanking portions or fields of a page, releasing held jobs]

3/1239 [Restricting the usage of resources, e.g. usage or user levels, credit limit, consumables, special fonts]

3/124 [Parallel printing or parallel ripping]

3/1241 [Dividing a job according to job requirements, e.g. black/white and colour pages, covers and body of books, tabs]

3/1242 [Image or content composition onto a page]

3/1243 [Variable data printing, e.g. document forms, templates, labels, coupons, advertisements, logos, watermarks, transactional printing, fixed content versioning]

3/1244 [Job translation or job parsing, e.g. page handing]

3/1245 [by conversion to intermediate or common format]

3/1246 [by handling markup languages, e.g. XSL, XML, HTML]

3/1247 [by conversion to printer ready format]

3/1248 [by printer language recognition, e.g. PDL, PCL, PDF]

3/125 [Page layout or assigning input pages onto output media, e.g. imposition]

3/1251 [for continuous media, e.g. web media, rolls]

3/1252 [for sheet based media]

3/1253 [Configuration of print job parameters, e.g. using UI at the client]

3/1254 [Automatic configuration, e.g. by driver]

3/1255 [Settings incompatibility, e.g. constraints, user requirements vs. device capabilities]

3/1256 [User feedback, e.g. print preview, test print, proofing, pre-flight checks]

3/1257 [by using pre-stored settings, e.g. job templates, presets, print styles]

3/1258 [by updating job settings at the printer]

3/1259 [Print job monitoring, e.g. job status]
3/126 . . . . . {Job scheduling, e.g. queuing, determine appropriate device}
3/1261 . . . . . {by using alternate printing}
3/1262 . . . . . {by grouping or ganging jobs}
3/1263 . . . . . {based on job priority, e.g. re-arranging the order of jobs, e.g. the printing sequence}
3/1264 . . . . . {by assigning post-processing resources}
3/1265 . . . . . {Printing by reference, e.g. retrieving document/image data for a job from a source mentioned in the job}
3/1267 . . . . . {Job repository, e.g. non-scheduled jobs, delay printing}
3/1268 . . . . . {Job submission, e.g. submitting print job order or request not the print data itself}
3/1269 . . . . . {by broadcasting server}
3/127 . . . . . {by using hot folders, e.g. folder for which print settings or print data management rules are set in advance}
3/1271 . . . . . {Job submission at the printing node, e.g. creating a job from a data stored locally or remotely (G06F 3/1283 takes precedence)}
3/1272 . . . . . {Digital storefront, e.g. e-ordering, web2print, submitting a job from a remote submission screen}
3/1273 . . . . . {Print job history, e.g. logging, accounting, tracking}
3/1274 . . . . . {Deleting of print job}
3/1275 . . . . . {Print workflow management, e.g. defining or changing a workflow, cross publishing}
3/1276 . . . . . {within a printer driver, e.g. driver resides either on a server or on a client}
3/1277 . . . . . {using filter pipeline, e.g. outside the driver, adding traps}
3/1278 . . . . . {specifically adapted to adopt a particular infrastructure}
3/1279 . . . . . {Controller construction, e.g. aspects of the interface hardware}
3/128 . . . . . {Direct printing, e.g. sending document file, using memory stick, printing from a camera}
3/1281 . . . . . {Multi engine printer devices, e.g. one entity having multiple output engines}
3/1282 . . . . . {High volume printer device}
3/1284 . . . . . {Local printer device}
3/1285 . . . . . {Remote printer device, e.g. being remote from client or server}
3/1286 . . . . . {via local network}
3/1287 . . . . . {via internet}
3/1288 . . . . . {in client-server-printer device configuration}
3/1289 . . . . . {in server-client-printer device configuration, e.g. the server does not see the printer}
3/129 . . . . . {in server-printer device-client configuration, e.g. print flow goes from server to printer and then bidirectional from printer to client, i.e. the client does not communicate with the server}
3/1291 . . . . . {Pool of printer devices: self-managing printing devices in a network, e.g. without a server}
3/1292 . . . . . {Mobile client, e.g. wireless printing}
3/1293 . . . . . {Printer information exchange with computer}
3/1294 . . . . . {Status or feedback exchange}
3/1295 . . . . . {Buffering means}
3/1296 . . . . . {Printer job scheduling or printer resource handling}
3/1297 . . . . . {Printer code translation, conversion, emulation, compression; Configuration of printer parameters}
3/1298 . . . . . {Printer language recognition, e.g. programme control language, page description language}
3/13 . . . . . . . Digital output to plotter ; (Cooperation and interconnection of the plotter with other functional units)
3/14 . . . . . . . Digital output to display device; (Cooperation and interconnection of the display device with other functional units) (control of display in general G09G; arrangements for producing a permanent visual presentation of the output data G06K 15/00)
3/1407 . . . . . {General aspects irrespective of display type, e.g. determination of decimal point position, display with fixed or driving decimal point, suppression of non-significant zeros}
3/1415 . . . . . {with means for detecting differences between the image stored in the host and the images displayed on the displays}
3/1423 . . . . . {controlling a plurality of local displays, e.g. CRT and flat panel display}
3/1431 . . . . . {using a single graphics controller}
3/1438 . . . . . {using more than one graphics controller}
3/1446 . . . . . {display composed of modules, e.g. video walls}
3/1454 . . . . . {involving copying of the display data of a local workstation or window to a remote workstation or window so that an actual copy of the data is displayed simultaneously on two or more displays, e.g. teledisplay}
3/1462 . . . . . {with means for detecting differences between the image stored in the host and the images displayed on the remote displays}
3/147 . . . . . . . using display panels
3/1475 . . . . . {with conversion of CRT control signals to flat panel control signals, e.g. adapting the palette memory}
3/153 . . . . . . . using cathode-ray tubes
3/16 . . . . . . . Sound input; Sound output (speech processing G10L)
3/162 . . . . . . . {Interface to dedicated audio devices, e.g. audio drivers, interface to CODECs}
3/165 . . . . . . . {Management of the audio stream, e.g. setting of volume, audio stream path}
3/167 . . . . . . . {Audio in a user interface, e.g. using voice commands for navigating, audio feedback}

5/00 Methods or arrangements for data conversion without changing the order or content of the data handled (by coding or decoding H03M)
5/01 for shifting, e.g. justifying, scaling, normalising (digital stores in which the information is moved stepwise, e.g. shift-registers G11C 19/00; digital stores in which the information circulates G11C 21/00)
5/012 . . . . . . . (in floating-point computations)
handled operating upon the order or content of the data

Methods or arrangements for processing data by operating upon the order or content of the data handled (logic circuits H03K 19/00)

Comparing digital values (G06F 7/06, G06F 7/38 take precedence; information retrieval G06F 16/00; comparing pulses H03K 5/22)

[adaptive, e.g. self learning]

[Magnitude comparison, i.e. determining the relative order of operands based on their numerical value, e.g. window comparator]

Arrangements for sorting, selecting, merging or comparing data on individual record carriers (sorting of postal letters B07C; conveying record carriers from one station to another G06K 13/02)

[using coordinate rotation digital computer]

Complex multiplication

Multiplying; Dividing (G06F 7/405 takes precedence)

[by successive additions or subtractions]

[by partial product forming (with electric multiplication table)]

[using electromechanical counter-type accumulators]

[Adding; subtracting]

[Multiplying; dividing]

[by successive additions or subtractions]

[by partial product forming (with electric multiplication table)]

[by successive multiplication or division by 2]

[by using preset multiples of the multiplicand or the divisor]

[for evaluating functions by calculation]

[using non-contact-making devices, e.g. tube, solid state device; using unspecified devices]

[Computations with complex numbers]

[Complex multiplication]

[using coordinate rotation digital computer [CORDIC]]

[using signed-digit representation]
Computations with numbers represented by a non-linear combination of denominational numbers, e.g. rational numbers, logarithmic number system, floating-point numbers (conversion to or from floating-point codes H03M 7/24) (G06F 7/4806, G06F 7/4824, G06F 7/49, G06F 7/491, G06F 7/544 take precedence)

Logarithmic number system

Computations with rational numbers

Adding; Subtracting (G06F 7/4833, G06F 7/4836 take precedence)

Multiplying; Dividing (G06F 7/4833, G06F 7/4836 take precedence)

[Dividing]

[Multiplying]

Computations with a radix, other than binary, 8, 16 or decimal, e.g. ternary, negative or imaginary radices, mixed radix (non-linear PCM (G06F 7/4824 takes precedence)

Computations with decimal numbers [radix 12 or 20. (G06F 7/4824 takes precedence)

(Adding; Subtracting (G06F 7/492, G06F 7/498 take precedence)

(Multiplying; Dividing (G06F 7/492, G06F 7/498 take precedence)

[Dividing]

using a binary weighted representation within each denomination (G06F 7/498 takes precedence)

[Adding; Subtracting (G06F 7/493 takes precedence)

the representation being the natural binary coded representation, i.e. 8421-code

Adding; Subtracting

in digit-serial fashion, i.e. having a single digit-handling circuit treating all denominations after each other

Multiplying; Dividing

using counter-type accumulators

[Adding; Subtracting]

[Multiplying; Dividing]

[by successive additions or subtractions]

[by successive multiplication or division by 2]

[by table look-up]

Denomination or exception handling, e.g. rounding, overflow

NOTE

{ documents published before 12-2005 are not systematically classified in the subgroups of G06F 7/499 : See the relevant subgroup of G06F 7/48 and the ICOs G06F 7/499 + }
7/52 ... Multiplying; Dividing
(G06F 7/483 - G06F 7/491, G06F 7/544 take precedence)

7/523 ... Multiplying only

7/525 ... (using indirect methods, e.g. quarter square method, via logarithmic domain)

7/527 ... in serial-serial fashion, i.e. both operands being entered serially (G06F 7/533 takes precedence)

7/5272 ... { with row wise addition of partial products }

7/525 ... { using carry save adders }

7/5277 ... { with column wise addition of partial products }

7/53 ... in parallel-parallel fashion, i.e. both operands being entered in parallel (G06F 7/533 takes precedence)

7/5306 ... { with row wise addition of partial products (G06F 7/5324 takes precedence) }

7/5324 ... { partitioned, i.e. using repetitively a smaller parallel parallel multiplier or using an array of such smaller multipliers }

7/533 ... Reduction of the number of iteration steps or stages, e.g. using the Booth algorithm, log-sum, odd-even

7/5332 ... { by skipping over strings of zeroes or ones, e.g. using the Booth Algorithm }

7/5334 ... { by using multiple bit scanning, i.e. by decoding groups of successive multiplier bits in order to select an appropriate precalculated multiple of the multiplicand as a partial product }

7/5336 ... { overlapped, i.e. with successive bitgroups sharing one or more bits being recoded into signed digit representation, e.g. using the Modified Booth Algorithm }

7/5338 ... { each bitgroup having two new bits, e.g. 2nd order MBA }

7/535 ... Dividing only

7/537 ... Reduction of the number of iteration steps or stages, e.g. using the Sweeney-Robertson-Tocher [SRT] algorithm

7/5375 ... { Non restoring calculation, where each digit is either negative, zero or positive, e.g. SRT; }

7/544 ... for evaluating functions by calculation
(G06F 7/4824 takes precedence)

7/5443 ... { Sum of products (for applications thereof, see the relevant places, e.g. G06F 17/10, H03H 17/00)

7/5446 ... { using crossaddition algorithms, e.g. CORDIC }

7/548 ... Trigonometric functions; Co-ordinate transformations

7/552 ... Powers or roots, [e.g. Pythagorean sums]

7/5525 ... { Roots or inverse roots of single operands }

7/556 ... Logarithmic or exponential functions

7/57 ... Arithmetic logic units [ALU], i.e. arrangements or devices for performing two or more of the operations covered by groups G06F 7/483 - G06F 7/556 or for performing logical operations (instruction execution G06F 9/30) (G06F 7/49, G06F 7/491 take precedence; logic gate circuits H03K 19/00)

7/575 ... Basic arithmetic logic units, i.e. devices selectable to perform either addition, subtraction or one of several logical operations, using, at least partially, the same circuitry

7/58 ... Random or pseudo-random number generators

7/582 ... [Pseudo-random number generators]

7/584 ... { using finite field arithmetic, e.g. using a linear feedback shift register }

7/586 ... { using an integer arithmetic, e.g. using linear congruential method }

7/588 ... { Random number generators, i.e. based on natural stochastic processes }

7/60 ... Methods or arrangements for performing computations using a digital non-denominational number representation, i.e. number representation without radix; Computing devices using combinations of denominational and non-denominational quantity representations, e.g. using diffuction pulse trains, STEELE computers, phase computers (conversion of digital data to or from non-denominational form H03M 5000, H03M 7/00)

7/602 ... { using delta-sigma sequences }

7/605 ... { Additive or subtractive mixing of two pulse rates into one (beat-frequency oscillators H03B 21/00; input circuits of electric counters, H03K 19/00)

7/607 ... { number-of-ones counters, i.e. devices for counting the number of input lines set to ONE among a plurality of input lines, also called bit counters or parallel counters (for applications thereof, see the relevant places, e.g. G06F 7/49, G06F 7/5013, G06F 7/509, H03M 1/00, H03M 7/201)

7/62 ... Performing operations exclusively by counting total number of pulses; { Multiplication, division or derived operations using combined denominational and incremental processing by counters, i.e. without column shift (G06F 7/68 takes precedence) }

7/64 ... Digital differential analysers, i.e. computing devices for differentiation, integration or solving differential or integral equations, using pulses representing increments; Other incremental computing devices for solving difference equations (G06F 7/70 takes precedence; differential analysers using hybrid computing techniques G06J 1/02; DDA application in numerical control G05B 19/18)

7/66 ... wherein pulses represent unitary increments only
using pulse rate multipliers or dividers [pulse rate multipliers or dividers per se] (G06F 7/700 takes precedence; frequency division in electronic watches G04G 3/002; frequency multiplication or division in oscillators H03B 19/00; frequency dividing counters per se H03K 23/00 - H03K 29/00)

using stochastic pulse trains, i.e. randomly occurring pulses the average pulse rates of which represent numbers [conversion of analogue signals into stochastic pulse trains and vice versa H03M 1/04]

using residue arithmetic

{Modular inversion, reciprocal or quotient calculation (G06F 7/724, G06F 7/727, G06F 7/728 takes precedence)}

{Modular multiplication (G06F 7/724, G06F 7/727, G06F 7/728 takes precedence)}

{Modular exponentiation (G06F 7/724, G06F 7/727, G06F 7/728 takes precedence)}

{Finite field arithmetic (for error detection or correction in general H03M 13/00, in computers G06F 11/10)}

{over elliptic curves}

{Inversion; Reciprocal calculation; Division of elements of a finite field}

{Modulo N arithmetic, with N being either (2**n)-1, 2**n or (2**n)+1, e.g. mod 3, mod 4 or mod 5 (G06F 7/728 takes precedence)}

{using Montgomery reduction}

{using representation by a residue number system}

Selecting or encoding within a word the position of one or more bits having a specified value, e.g. most or least significant one or zero detection, priority encoders [with shifting G06F 5/01]}

Arrangements for rearranging, permuting or selecting data according to predetermined rules, independently of the content of the data (according to the content of the data G06F 7/06, G06F 7/22; parallel / series conversion or vice versa H03M 9/00)

{having at least two separately controlled rearrangement levels, e.g. multistage interconnection networks (G06F 7/764 - G06F 7/768 take precedence)}

{Masking]

{Generation of all possible permutations}

{Data position reversal, e.g. bit reversal, byte swapping}

for changing the order of data flow, e.g. matrix transposition, LIFO buffers; Overflow or underflow handling therefor

{having a sequence of storage locations each being individually accessible for both enqueue and dequeue operations, e.g. using a RAM]

Arrangements for software engineering (testing or debugging G06F 11/36; administrative, planning or organisation aspects of software project management G06Q 10/06)

Requirements analysis; Specification techniques

Software design

{Procedural]

{Object-oriented]

Creation or generation of source code

{Programming languages or programming paradigms]

{Functional or applicable languages; Rewrite languages]

{List processing, e.g. LISP programming language]

{Logic programming, e.g. PROLOG programming language]

{Unification or backtracking]

{Parallel programming languages (G06F 8/313 takes precedence)}

{Object-oriented languages]

{Aspect-oriented programming techniques]

Intelligent editors

Graphical or visual programming

model driven

{Round-trip engineering]

Software reuse

{Compiler construction; Parser generation]

for implementing user interfaces

Transformation of program code

Compilation

{Syntactic analysis]

{Preprocessors]

{Lexical analysis]

{Parsing]

{Checking; Contextual analysis]

{Dependency analysis; Data or control flow analysis]

{Pointers; Aliasing]

{Semantic checking]

{Type checking]

{Encoding]

{Register allocation; Assignment of physical memory space to logical memory space]

{Optimisation]

{Reducing the energy consumption]

{Reducing the memory space required by the program code]

{Detecting and removal of dead or redundant code]

{Exlining; Procedural abstraction]

{Reducing the execution time required by the program code]

{Reducing the number of cache misses; Data prefetching (cache prefetching G06F 12/0862)]

{Inlining]

{Exploiting fine grain parallelism, i.e. parallelism at instruction level (run-time instruction scheduling G06F 9/3836)}

{Avoiding pipeline stalls]

{Software pipelining]

{Target code generation]

{Exploiting coarse grain parallelism in compilation, i.e. parallelism between groups of instructions]

{Code distribution (considering CPU load at run-time G06F 9/505; load rebalancing G06F 9/5083)}

{Loops]

{Data distribution]
Software maintenance or management

Methods to solve the "Year 2000" (Y2K) problem

Software deployment

Adapting program code to run in a different environment; Porting

Structural analysis for program understanding

Program documentation

Software metrics

G06F 21/57

Configuration management

Version control (security arrangements therefor)

RETARGETABLE

G06F 21/57

All groups listed in this Warning should be considered in order to perform a complete search.

G06F 8/65

using techniques specially adapted for alterable solid state memories, e.g. for EEPROM or flash memories

while running

Incremental updates; Differential updates

of program code stored in read-only memory (ROM)

Software maintenance or management

Version control (security arrangements therefor)

G06F 21/57

Configuration management

G06F 8/71

Arrangements for program control, e.g. control units (program control for peripheral devices G06F 13/10)

using wired connections, e.g. plugboards

using record carriers containing only program instructions (G06F 9/06 takes precedence)

using stored programs, i.e. using an internal store of processing equipment to receive or retain programs

Microcontrol or microprogram arrangements

Execution means for microinstructions irrespective of the microinstruction function, e.g. decoding of microinstructions and nanoinstructions; timing of microinstructions; programmable logic arrays; delays and fan-out problems

Microinstruction function, e.g. input/output microinstruction; diagnostic microinstruction; microinstruction format

Loading of the microprogram

Address formation of the next micro-instruction (G06F 9/28 takes precedence) (; Microprogram storage or retrieval arrangements)

Microinstruction address formation

{Arrangements for next microinstruction selection}

Microinstruction selection based on results of processing

(by address selection on input of storage)

(by instruction selection on output of storage)

Microinstruction selection not based on processing results, e.g. interrupt, patch, first cycle store, diagnostic programs

Enhancement of operational speed, e.g. by using several microcontrol devices operating in parallel

Arrangements for executing machine instructions, e.g. instruction decode (for executing microinstructions G06F 9/22)

{Arrangements for executing specific machine instructions}

[to perform operations on data operands]

Arithmetic instructions

{with variable precision}

{Bit or string instructions; instructions using a mask}

{Compare instructions, e.g. Greater-Than, Equal-To, MINMAX}

{Format conversion instructions, e.g. Floating-Point to Integer, decimal conversion}

{Logical and Boolean instructions, e.g. XOR, NOT}

{Movement instructions, e.g. MOVE, SHIFT, ROTATE, SHUFFLE}

{Instructions to perform operations on packed data, e.g. vector operations}

{to perform operations on memory}

{LOAD or STORE instructions; Clear instruction}

{Prefetch instructions; cache control instructions}

{to perform operations for flow control}
9/30054 . . . . . . {Unconditional branch instructions}
9/30058 . . . . . . {Conditional branch instructions}
9/30061 . . . . . . {Multi-way branch instructions, e.g. CASE}
9/30065 . . . . . . {Loop control instructions; iterative instructions, e.g. LOOP, REPEAT}
9/30069 . . . . . . {Instruction skipping instructions, e.g. SKIP}
9/30072 . . . . . . {to perform conditional operations, e.g. using guard}
9/30076 . . . . . . {to perform miscellaneous control operations, e.g. NOP}
9/30079 . . . . . . {Pipeline control instructions}
9/30083 . . . . . . {Power or thermal control instructions}
9/30087 . . . . . . {Synchronisation or serialisation instructions}
9/3009 . . . . . . {Thread control instructions}
9/30094 . . . . . . {Condition code generation, e.g. Carry, Zero flag}
9/30098 . . . . . . {Register arrangements}
9/30101 . . . . . . {Special purpose registers}
9/30105 . . . . . . {Register structure}
9/30109 . . . . . . {having multiple operands in a single register}
9/30112 . . . . . . {for variable length data, e.g. single or double registers}
9/30116 . . . . . . {Shadow registers, e.g. coupled registers, not forming part of the register space}
9/3012 . . . . . . {Organisation of register space, e.g. banked or distributed register file}
9/30123 . . . . . . {according to context, e.g. thread buffers}
9/30127 . . . . . . {Register windows}
9/3013 . . . . . . {according to data content, e.g. floating-point registers, address registers}
9/30134 . . . . . . {Register stacks; shift registers}
9/30138 . . . . . . {Extension of register space, e.g. register cache}
9/30141 . . . . . . {Implementation provisions of register files, e.g. ports}
9/30145 . . . . . . {Instruction analysis, e.g. decoding, instruction word fields}
9/30149 . . . . . . {of variable length instructions}
9/30152 . . . . . . {Determining start or end of instruction; determining instruction length}
9/30156 . . . . . . {Special purpose encoding of instructions, e.g. Gray coding}
9/3016 . . . . . . {Decoding the operand specifier, e.g. specifier format}
9/30163 . . . . . . {with implied specifier, e.g. top of stack}
9/30167 . . . . . . {of immediate specifier, e.g. constants}
9/3017 . . . . . . {Runtime instruction translation, e.g. macros}
9/30174 . . . . . . {for non-native instruction set, e.g. Java byte, legacy code}
9/30178 . . . . . . {of compressed or encrypted instructions}
9/30181 . . . . . . {Instruction operation extension or modification}
9/30185 . . . . . . {according to one or more bits in the instruction, e.g. prefix, sub-opcode}
9/30189 . . . . . . {according to execution mode, e.g. mode flag}
9/30192 . . . . . . {according to data descriptor, e.g. dynamic data typing}
9/30196 . . . . . . {using decoder, e.g. decoder per instruction set, adaptable or programmable decoders}
9/32 . . . . . . {Address formation of the next instruction, e.g. by incrementing the instruction counter (G06F 9/38 takes precedence)}
9/321 . . . . . . {Program or instruction counter, e.g. incrementing}
9/322 . . . . . . {for non-sequential address}
9/324 . . . . . . {for program counter relative addressing}
9/325 . . . . . . {for loops, e.g. loop detection, loop counter}
9/327 . . . . . . {for interrupts}
9/328 . . . . . . {for runtime instruction patching}
9/34 . . . . . . {Addressing or accessing the instruction operand or the result ( Formation of operand address; Addressing modes (address translation G06F 12/00))}
9/342 . . . . . . {Extension of operand address space}
9/345 . . . . . . {of multiple operands or results (addressing multiple banks G06F 12/06)}
9/3455 . . . . . . {using stride}
9/35 . . . . . . {Indirect addressing (i.e. using single address operand, e.g. address register)
9/355 . . . . . . {Indexed addressing (i.e. using more than one address operand)
9/3552 . . . . . . {using wraparound, e.g. modulo or circular addressing}
9/3555 . . . . . . {using scaling, e.g. multiplication of index}
9/3557 . . . . . . {using program counter as base address}
9/38 . . . . . . {Concurrent instruction execution, e.g. pipeline, look ahead}
9/3802 . . . . . . {Instruction prefetching}
9/3804 . . . . . . {for branches, e.g. hedging, branch folding}
9/3806 . . . . . . {using address prediction, e.g. return stack, branch history buffer}
9/3808 . . . . . . {for instruction reuse, e.g. trace cache, branch target cache}
9/381 . . . . . . {Loop buffering}
9/3812 . . . . . . {with instruction modification, e.g. store into instruction stream}
9/3814 . . . . . . {Implementation provisions of instruction buffers, e.g. prefetch buffer; banks}
9/3816 . . . . . . {Instruction alignment, e.g. cache line crossing}
9/3818 . . . . . . {Decoding for concurrent execution}
9/382 . . . . . . {Pipelined decoding, e.g. using predecoding}
9/3822 . . . . . . {Parallel decoding, e.g. parallel decode units}
9/3824 . . . . . . {Operand accessing}
9/3826 . . . . . . {Data result bypassing, e.g. locally between pipeline stages, within a pipeline stage}
9/3828 . . . . . . {with global bypass, e.g. between pipelines, between clusters}
9/383 . . . . . . {Operand prefetching (cache prefetching G06F 12/062)}
9/3832 . . . . . . {Value prediction for operands; operand history buffers}
9/3834 . . . . . . {Maintaining memory consistency (cache consistency protocols G06F 12/0815)}
Functional units 

{ using a plurality of independent parallel processor G06F 13/12 }

{ using instruction pipelines }

Exception handling (error detection or recovery, e.g. branch miss-prediction, nullification)

{ with result invalidation, e.g. nullification }

[Instruction issuing, e.g. dynamic instruction scheduling, out of order instruction execution]

Dependency mechanisms, e.g. register scoreboard

Register renaming

 speculative instruction execution

{ using dynamic prediction, e.g. branch history table } 

using static prediction, e.g. branch taken strategy

{ using hybrid branch prediction, e.g. selection between prediction techniques }

{ from multiple instruction streams, e.g. multistreaming (initiation or dispatching of multiple tasks or threads G06F 9/48) }

of compound instructions

Reordering, e.g. using a queue, age tags

Result writeback, i.e. updating the architectural state

{ with result invalidation, e.g.

[Recovery, e.g. branch miss-prediction, exception handling (error detection or correction G06F 11/00) ]

using deferred exception handling, e.g. exception flags }

using instruction pipelines

Implementation aspects, e.g. pipeline latches; pipeline synchronisation and clocking

Asynchronous instruction pipeline, e.g. using handshake signals between stages

Variable length pipelines, e.g. elastic pipeline

{ Pipelining a single stage, e.g. superpipelining }

{ using a slave processor, e.g. coprocessor (peripheral processor G06F 13/12; vector processor G06F 15/053) }

{ for non-native instruction execution, e.g. executing a command; for Java instruction set }

{ Arrangements for communication of instructions and data }

Two-engine architectures, i.e. stand-alone processor acting as a slave processor

{ using a plurality of independent parallel functional units }

controlled by a single instruction, e.g. SIMD

controlled by multiple instructions, e.g. MIMD, decoupled access or execute

organised in groups of units sharing resources, e.g. clusters

controlled in tandem, e.g. multiplier-accumulator

{ for complex operations, e.g. multidimensional or interleaved address generators, macros }

{ with adaptable data path }

Arrangements for executing specific programs

Bootstrapping (security arrangements therefor G06F 21/57)

Processor initialisation

Initialisation of multiprocessor systems

Loading of operating system

Boot device selection

Multiboot arrangements, i.e. selecting an operating system to be loaded

Configuring for operating with peripheral devices; Loading of device drivers

{ Plug-and-play [PnP] }

Self describing peripheral devices

{ Network booting; Remote initial program loading [RIPL] }

{ Suspend and resume; Hibernate and awake }

Shutdown

Program loading or initiating (bootstrap G06F 9/4401; security arrangements for program loading or initiating G06F 21/57)

WARNING

Group G06F 9/445 is impacted by reclassification into groups G06F 21/57 - G06F 21/577.

All groups listed in this Warning should be considered in order to perform a complete search.

Configuring for program initiating, e.g. using registry, configuration files

User profiles; Roaming

Dynamic linking or loading; Link editing at or after load time, e.g. Java class loading

Plug-ins; Add-ons

Selecting among different versions

Retargetable

Fat binaries

Conflict resolution, i.e. enabling coexistence of conflicting executables

Code layout in executable memory

Sharing

Immediately runnable code

Execute-in-place [XIP]

Preparing or optimising for loading

Portable applications, i.e. making applications self-contained, e.g. U3 standard

Program code verification, e.g. Java bytecode verification, proof-carrying code (high-level semantic checks G06F 8/43; testing and debugging software G06F 11/36)

Unloading

Execution paradigms, e.g. implementations of programming paradigms

Procedural

Executing subprograms

Formation of subprogram jump address

Object-oriented

Object-oriented method invocation or resolution

Optimising based on receiver type
09/4492 . . . . . . . . . . . [Inheritance]
09/4493 . . . . . . . . . . . [Object persistence]
09/4494 . . . . . . . . . . . [data driven]
09/4496 . . . . . . . . . . . [Unification in logic programming]
09/4498 . . . . . . . . . . . [Finite state machines]
09/451 . . . . . . . . . . . Execution arrangements for user interfaces
09/452 . . . . . . . . . . . [Remote windowing, e.g. X-Window System, desktop virtualisation (protocols for telewriting H04L 67/38)]
09/453 . . . . . . . . . . . [Help systems]
09/454 . . . . . . . . . . . [Multi-language systems; Localisation; Internationalisation]
09/455 . . . . . . . . . . . Emulation; Interpretation; Software simulation, e.g. virtualisation or emulation of application or operating system execution engines
09/45504 . . . . . . . . . . . [Abstract machines for programme code execution, e.g. Java virtual machine [JVM], interpreters, emulators]
09/45508 . . . . . . . . . . . [Runtime interpretation or emulation, e.g. emulator loops, bytecode interpretation]
09/45512 . . . . . . . . . . . [Command shells]
09/45516 . . . . . . . . . . . [Runtime code conversion or optimisation]
09/4552 . . . . . . . . . . . [Involving translation to a different instruction set architecture, e.g. just-in-time translation in a JVM]
09/45525 . . . . . . . . . . . [Optimisation or modification within the same instruction set architecture, e.g. HP Dynamo]
09/45529 . . . . . . . . . . . [Embedded in an application, e.g. JavaScript in a Web browser]
09/45533 . . . . . . . . . . . [Hypervisors; Virtual machine monitors]
09/45537 . . . . . . . . . . . [Providing facilities of other operating environments, e.g. WINE (I/O emulation G06F 13/105)]
09/45541 . . . . . . . . . . . [Bare-metal, i.e. hypervisor runs directly on hardware]
09/45545 . . . . . . . . . . . [Guest-host, i.e. hypervisor is an application program itself, e.g. VirtualBox]
09/4555 . . . . . . . . . . . [Para-virtualisation, i.e. guest operating system has to be modified]
09/45544 . . . . . . . . . . . [Instruction set architectures of guest OS and hypervisor or native processor differ, e.g. Bochs or VirtualPC on PowerPC MacOS]
09/45558 . . . . . . . . . . . [Hypervisor-specific management and integration aspects]
2009/45562 . . . . . . . . . . . [Creating, deleting, cloning virtual machine instances]
2009/45566 . . . . . . . . . . . [Nested virtual machines]
2009/4557 . . . . . . . . . . . [Distribution of virtual machine instances; Migration and load balancing]
2009/45575 . . . . . . . . . . . [Starting, stopping, suspending or resuming virtual machine instances]
2009/45579 . . . . . . . . . . . [I/O management, e.g. providing access to device drivers or storage]
2009/45583 . . . . . . . . . . . [Memory management, e.g. access or allocation]
2009/45587 . . . . . . . . . . . [Isolation or security of virtual machine instances]
2009/45591 . . . . . . . . . . . [Monitoring or debugging support]
2009/45595 . . . . . . . . . . . [Network integration; Enabling network access in virtual machine instances]
09/46 . . . . . . . . . . . . . Multiprogramming arrangements
09/461 . . . . . . . . . . . . . [Saving or restoring of program or task context]
09/462 . . . . . . . . . . . . . [with multiple register sets]
09/463 . . . . . . . . . . . . . [Program control block organisation]
09/465 . . . . . . . . . . . . . [Distributed object oriented systems (remote method invocation [RMI]) G06F 9/548]
09/466 . . . . . . . . . . . . . [Transaction processing]
09/467 . . . . . . . . . . . . . [Transactional memory (G06F 9/528 takes precedence)]
09/468 . . . . . . . . . . . . . [Specific access rights for resources, e.g. using capability register]
09/48 . . . . . . . . . . . . . Program initiating; Program switching, e.g. by interrupt
09/4806 . . . . . . . . . . . . . [Task transfer initiation or dispatching]
09/4812 . . . . . . . . . . . . . [by interrupt, e.g. masked]
09/4818 . . . . . . . . . . . . . [Priority circuits therefor]
09/4825 . . . . . . . . . . . . . [Interrupt from clock, e.g. time of day]
09/4831 . . . . . . . . . . . . . [with variable priority]
09/4837 . . . . . . . . . . . . . [time dependent]
09/4843 . . . . . . . . . . . . . [by program, e.g. task dispatcher, supervisor, operating system]
09/485 . . . . . . . . . . . . . [Task life-cycle, e.g. stopping, restarting, resuming execution (G06F 9/4881 takes precedence)]
09/4856 . . . . . . . . . . . . . [resumption being on a different machine, e.g. task migration, virtual machine migration (G06F 9/508 takes precedence)]
09/4862 . . . . . . . . . . . . . [the task being a mobile agent, i.e. specifically designed to migrate]
09/4868 . . . . . . . . . . . . . [with creation or replication]
09/4875 . . . . . . . . . . . . . [with migration policy, e.g. auction, contract negotiation]
09/4881 . . . . . . . . . . . . . [Scheduling strategies for dispatcher, e.g. round robin, multi-level priority queues]
09/4887 . . . . . . . . . . . . . [involving deadlines, e.g. rate based, periodic]
09/4893 . . . . . . . . . . . . . [taking into account power or heat criteria (power management in computers in general G06F 1/3203; thermal management in computers in general G06F 1/206)]
09/50 . . . . . . . . . . . . . Allocation of resources, e.g. of the central processing unit [CPU]
09/5005 . . . . . . . . . . . . . [to service a request]
09/5011 . . . . . . . . . . . . . [the resources being hardware resources other than CPUs, Servers and Terminals]
09/5016 . . . . . . . . . . . . . [the resource being the memory]
09/5022 . . . . . . . . . . . . . [Mechanisms to release resources]
09/5027 . . . . . . . . . . . . . [the resource being a machine, e.g. CPUs, Servers, Terminals]
09/5033 . . . . . . . . . . . . . [considering data affinity]
09/5038 . . . . . . . . . . . . . [considering the execution order of a plurality of tasks, e.g. taking priority or time dependency constraints into consideration (scheduling strategies G06F 9/4881 and subgroups)]
09/5044 . . . . . . . . . . . . . [considering hardware capabilities]
09/505 . . . . . . . . . . . . . [considering the load]
NOTE

In this group the indexing codes of G06F 1/00 - G06F 15/00 are added

WARNING

This group is no longer used for the classification of new documents as from January 1, 2011. The documents are classified in G06F 11/07 and subgroups according to the features used for protecting

11/002 . [protection against parasitic influences, e.g. noise, temperatures]
Error detection or correction by redundancy in the event of error, e.g. for controlling element

Safety measures, i.e. ensuring safe condition in information, e.g. parity check, casting out 9's or out-of-m codes

Remedial or corrective actions (by retry; in a diagnosis (in a hardware test environment; in a software test environment)

Root cause analysis, i.e. error or fault or storing of non-error data

Error or fault detection not based on precedence; security arrangements for CRC or checksum (G06F 11/1076 takes precedence)

in individual solid state devices against unauthorized activity

in a remote unit communicating with a specific type of error (G06F 11/1048 takes precedence)

by exceeding a time limit, i.e. time-out, e.g. watchdogs

by exceeding a count or rate limit, e.g. word- or bit count limit

by bit configuration check, e.g. of formats or tags

Error or fault reporting or storing (reporting or storing of non-error data G06F 11/30, G06F 11/34)

Readable error formats, e.g. cross-platform generic formats, human understandable formats

Means for error signaling, e.g. using interrupts, exception flags, dedicated error registers

Content or structure details of the error report, e.g. specific table structure, specific error fields

Dumping, i.e. gathering error/state information after a fault for later diagnosis

Error filtering or prioritizing based on a policy defined by the user or on a policy defined by a hardware/software module, e.g. according to a severity level

Routing of error reports, e.g. with a specific transmission path or data flow

Storage of error reports, e.g. persistent data storage, storage using memory protection

Root cause analysis, i.e. error or fault diagnosis (in a hardware test environment G06F 11/22; in a software test environment G06F 11/36)

Remedial or corrective actions (by retry G06F 11/1402; recovery from an exception in an instruction pipeline G06F 9/3861; in a network context H04L 29/14)

Safety measures, i.e. ensuring safe condition in the event of error, e.g. for controlling element

Error detection or correction by redundancy in data representation, e.g. by using checking codes

using codes with inherent redundancy, e.g. n-out-of-m codes

Adding special bits or symbols to the coded information, e.g. parity check, casting out 9's or 11's

to protect a block of data words, e.g. CRC or checksum (G06F 11/1076 takes precedence; security arrangements for protecting computers or computer systems against unauthorized activity G06F 21/00)

in individual solid state devices (G06F 11/1004 takes precedence)

using codes or arrangements adapted for a specific type of error (G06F 11/1048 takes precedence)

Error in accessing a memory location, i.e. addressing error

Error in check bits

Identification of the type of error

Adjacent errors, e.g. error in n-bit (n>1) wide storage units, i.e. package error

Simple parity

Unidirectional errors

using arithmetic codes, i.e. codes which are preserved during operation, e.g. modulo 9 or 11 check

with specific ECC/EDC distribution

using arrangements adapted for a specific error detection or correction feature

Bypassing or disabling error detection or correction

Updating check bits on partial write, i.e. read/modify/write

Correcting systematically all correctable errors, i.e. scrubbing

in cache or content addressable memories

in sector programmable memories, e.g. flash disk (G06F 11/1072 takes precedence)

in multilevel memories

Parity data used in redundant arrays of independent storages, e.g. in RAID systems

Parity data distribution in semiconductor storages, e.g. in SSD

Reconstruction on already foreseen single or plurality of spare disks

Rebuilding, e.g. when physically replacing a failing disk

Parity calculation or recalculation after configuration or reconfiguration of the system

Error detection or correction of the data by redundancy in operation (G06F 11/16 takes precedence)

Saving, restoring, recovering or retrying

at machine instruction level

Checkpointing the instruction stream

for bus or memory accesses

at system level

Boot up procedures

Reconfiguring to eliminate the error (group management mechanisms in a peer-to-peer network H04L 67/1044)

by reconfiguration of paths

by reconfiguration of node membership

with loss of hardware functionality

with loss of software functionality

during software upgrading

using file system or storage system metadata

Restarting or rejuvenating

Resetting or repowering

Transmit or communication errors

Point-in-time backing up or restoration of persistent data
11/1448 . . . . . (Management of the data involved in backup or backup restore)
11/1451 . . . . . [by selection of backup contents]
11/1453 . . . . . [using de-duplication of the data]
11/1456 . . . . . (Hardware arrangements for backup)
11/1458 . . . . . (Management of the backup or restore process)
11/1461 . . . . . (Backup scheduling policy)
11/1464 . . . . . [for networked environments]
11/1466 . . . . . [to make the backup process non-disruptive]
11/1469 . . . . . (Backup restoration techniques)
11/1471 . . . . . (including logging of persistent data for recovery)
11/1474 . . . . . [in transactions (G06F 16/20 takes precedence)]
11/1476 . . . . . [in neural networks]
11/1479 . . . . . (Generic software techniques for error detection or fault masking)
11/1482 . . . . . [by means of middleware or OS functionality]
11/1484 . . . . . (involving virtual machines)
11/1487 . . . . . [using N-version programming]
11/1489 . . . . . (through recovery blocks)
11/1492 . . . . . (by run-time replication performed by the application software)
11/1494 . . . . . (N-modular type)
11/1497 . . . . . (Details of time redundant execution on a single processing unit)
11/16 . . . . . Error detection or correction of the data by redundancy in hardware
11/1604 . . . . . [where the fault affects the clock signals of a processing unit and the redundancy is at or within the level of clock signal generation hardware]
11/1608 . . . . . (Error detection by comparing the output signals of redundant hardware (G06F 11/1629, G06F 11/1666 take precedence; error detection or correction in information storage based on relative movement between record carrier and transducer G11B 20/18; checking static stores for correct operation G11C 29/00; for logic circuits H03K 19/003, H03K 19/007; for pulse counters or frequency dividers H03K 21/40))
11/1612 . . . . . [where the redundant component is persistent storage]
11/1616 . . . . . [where the redundant component is an I/O device or an adapter therefor]
11/162 . . . . . (Displays)
11/1625 . . . . . [in communications, e.g. transmission, interfaces]
11/1629 . . . . . (Error detection by comparing the output of redundant processing systems)
11/1633 . . . . . [using mutual exchange of the output between the redundant processing components]
11/1637 . . . . . [using additional compare functionality in one or some but not all of the redundant processing components]
11/1641 . . . . . [where the comparison is not performed by the redundant processing components]
11/1645 . . . . . [and the comparison itself uses redundant hardware]
11/165 . . . . . [with continued operation after detection of the error]
11/1654 . . . . . [where the output of only one of the redundant processing components can drive the attached hardware, e.g. memory or I/O]
11/1658 . . . . . (Data re-synchronization of a redundant component, or initial sync of replacement, additional or spare unit)
11/1662 . . . . . (the resynchronized component or unit being a persistent storage device (re-synchronization of failed mirror storage G06F 11/2082; rebuild or reconstruction of parity RAID storage G06F 11/1008))
11/1666 . . . . . [where the redundant component is memory or memory area]
11/167 . . . . . (Error detection by comparing the memory output)
11/1675 . . . . . (Temporal synchronisation or re-synchronisation of redundant processing components)
11/1679 . . . . . [at clock signal level]
11/1683 . . . . . [at instruction level]
11/1687 . . . . . [at event level, e.g. by interrupt or result of polling]
11/1691 . . . . . [using a quantum]
11/1695 . . . . . [which are operating with time diversity]
11/18 . . . . . using passive fault-masking of the redundant circuits (error detection by comparing the output of redundant processing systems with continued operation after detection of the error (G06F 11/165))
11/181 . . . . . [Eliminating the failing redundant component]
11/182 . . . . . [based on mutual exchange of the output between redundant processing components]
11/183 . . . . . [by voting, the voting not being performed by the redundant components]
11/184 . . . . . [where the redundant components implement processing functionality]
11/185 . . . . . [and the voting is itself performed redundantly]
11/186 . . . . . (Passive fault masking when reading multiple copies of the same data)
11/187 . . . . . (Voting techniques)
11/188 . . . . . [where exact match is not required]
11/20 . . . . . using active fault-masking, e.g. by switching out faulty elements or by switching in spare elements
11/2002 . . . . . [where interconnections or communication control functionality are redundant (flexible arrangements for bus networks involving redundancy H04L 12/40176)]
11/2005 . . . . . [using redundant communication controllers]
11/2007 . . . . . [using redundant communication media]
11/201 . . . . . [between storage system components]
11/2012 . . . . . [and using different communication protocols]
11/2015 . . . . . (Redundant power supplies (power supply failure G06F 1/30))
Detection or location of defective computer
hardware by testing during standby operation
or during idle time, e.g. start-up testing
11/3013 . . . {where the computing system is an embedded system, i.e. a combination of hardware and software dedicated to perform a certain function in mobile devices, printers, automotive or aircraft systems (testing or monitoring of control systems or parts thereof G05B 23/02)}

11/3017 . . . {where the computing system is implementing multitasking (multiprocessing arrangements G06F 9/46; allocation of resources G06F 9/50)}

11/302 . . . {where the computing system component is a software system}

11/3024 . . . {where the computing system component is a central processing unit [CPU]}

11/3027 . . . {where the computing system component is a bus}

11/3031 . . . {where the computing system component is a motherboard or an expansion card}

11/3034 . . . {where the computing system component is a storage system, e.g. DASD based or network based (digital recording or reproducing G11B 29/18; digital input from or digital output to record carriers G06F 3/06; arrangements and networking functions for distributed storage of data in a network H04L 29/0859)}

11/3037 . . . {where the computing system component is a memory, e.g. virtual memory, cache (accessing, addressing or allocating within memory systems or architectures G06F 12/00; checking stores for correct operation G11C 29/00)}

11/3041 . . . {where the computing system component is an input/output interface (interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units G06F 13/00)}

11/3044 . . . {where the computing system component is the mechanical casing of the computing system}

11/3048 . . . {where the topology of the computing system or computing system component explicitly influences the monitoring activity, e.g. serial, hierarchical systems}

11/3051 . . . {Monitoring arrangements for monitoring the configuration of the computing system or of the computing system component, e.g. monitoring the presence of processing resources, peripherals, I/O links, software programs (verification or detection of system hardware configuration G06F 11/2247)}

11/3055 . . . {Monitoring arrangements for monitoring the status of the computing system or of the computing system component, e.g. monitoring if the computing system is on, off, available, not available (error or fault processing without redundancy G06F 11/0703; error detection or correction by redundancy in data representation G06F 11/08; error detection or correction by redundancy in operation G06F 11/14; error detection or correction by redundancy in hardware G06F 11/16)}

11/3058 . . . {Monitoring arrangements for monitoring environmental properties or parameters of the computing system or of the computing system component, e.g. monitoring of power, currents, temperature, humidity, position, vibrations (thermal management in cooling arrangements of a computing system G06F 1/206)}

11/3062 . . . {where the monitored property is the power consumption (power management in a computing system G06F 1/3203)}

11/3065 . . . {Monitoring arrangements determined by the means or processing involved in reporting the monitored data (error or fault reporting or logging G06F 11/0766)}

11/3068 . . . {where the reporting involves data format conversion}

11/3072 . . . {where the reporting involves data filtering, e.g. pattern matching, time or event triggered, adaptive or policy-based reporting}

11/3075 . . . {the data filtering being achieved in order to maintain consistency among the monitored data, e.g. ensuring that the monitored data belong to the same timeframe, to the same system or component}

11/3079 . . . {the data filtering being achieved by reporting only the changes of the monitored data}

11/3082 . . . {the data filtering being achieved by aggregating or compressing the monitored data}

11/3086 . . . {where the reporting involves the use of self describing data formats, i.e. metadata, markup languages, human readable formats}

11/3089 . . . {Monitoring arrangements determined by the means or processing involved in sensing the monitored data, e.g. interfaces, connectors, sensors, probes, agents (software debugging using additional hardware using a specific debug interface G06F 11/3656; performance evaluation by tracing or monitoring G06F 11/3466)}

11/3093 . . . {Configuration details thereof, e.g. installation, enabling, spatial arrangement of the probes}

11/3096 . . . {wherein the means or processing minimize the use of computing system or of computing system component resources, e.g. non-intrusive monitoring which minimizes the probe effect: sniffing, intercepting, indirectly deriving the monitored data from other directly available data}

11/32 . . . {with visual [or acoustical] indication of the functioning of the machine}

11/321 . . . {Display for diagnostics, e.g. diagnostic result display, self-test user interface}

11/322 . . . {Display of waveforms, e.g. of logic analysers (G06F 11/323 takes precedence)}

11/323 . . . {Visualisation of programs or trace data}

11/324 . . . {Display of status information}

11/325 . . . {by lamps or LED’s}

11/326 . . . {for error or online/offline status}

11/327 . . . {Alarm or error message display}

11/328 . . . {Computer systems status display (G06F 11/327 takes precedence)}

11/34 . . . {Recording or statistical evaluation of computer activity, e.g. of down time, of input/output operation; Recording or statistical evaluation of user activity, e.g. usability assessment}

11/3404 . . . {for parallel or distributed programming}

11/3409 . . . {for performance assessment}

11/3414 . . . {Workload generation, e.g. scripts, playback}

11/3419 . . . {by assessing time}
12/00 Accessing, addressing or allocating within memory systems or architectures (digital input from, or digital output to record carriers, e.g. to disk storage units, G06F 3/306)
12/02 . Addressing or allocation; Relocation (program address sequencing G06F 9/00); arrangements for selecting an address in a digital store G11C 8/00)
12/0207 . (with multidimensional access, e.g. row/column, matrix)
12/0215 . (with look ahead addressing means)
12/0223 . (User address space allocation, e.g. contiguous or non contiguous base addressing)
12/023 . [Free address space management]
12/0238 . . . (Memory management in non-volatile memory, e.g. resistive RAM or ferroelectric memory)
12/0246 . . . (in block erasable memory, e.g. flash memory)
12/0253 . . . (Garbage collection, i.e. reclamation of unreferenced memory)
12/0261 . . . (using reference counting)
12/0269 . . . (Incremental or concurrent garbage collection, e.g. in real-time systems (G06F 12/0261 takes precedence))
12/0276 . . . (Generational garbage collection)
12/0284 . . . (Multiple user address space allocation, e.g. using different base addresses (interprocessor communication G06F 15/163))
12/0292 . . . (using tables or multilevel address translation means (G06F 12/023 takes precedence); address translation in virtual memory systems G06F 12/10))
12/04 . Addressing variable-length words or parts of words
12/06 . . . Addressing a physical block of locations, e.g. base addressing, module addressing, memory dedication (G06F 12/08 takes precedence)

NOTE
This group is limited to Module addressing or allocation; base addressing is classified in G06F 12/0223.
12/0607 . . . [Interleaved addressing]
12/0615 . . . [Address space extension]
12/0623 . . . (for memory modules)
12/063 . . . (for I/O modules, e.g. memory mapped I/O (I/O protocol G06F 13/42))
12/0638 . . . (Combination of memories, e.g. ROM and RAM such as to permit replacement or supplementing of words in one module by words in another module (address formation of the next microinstruction G06F 9/26; masking faults in memories by using spares or by reconfiguring G11C 29/70))
12/0646 . . . [Configuration or reconfiguration]
12/0653 . . . (with centralised address assignment)
12/0661 . . . (and decentralised selection)
12/0669 . . . (with decentralised address assignment)
12/0676 . . . (the address being position dependent)
12/0684 . . . (with feedback, e.g. presence or absence of unit detected by addressing, overflow detection)
12/0692 . . . [Multiconfiguration, e.g. local and global addressing]
in hierarchically structured memory systems, e.g. virtual memory systems

Addressing of a memory level in which the access to the desired data or data block requires associative addressing means, e.g. caches

with main memory updating (G06F 12/0806 takes precedence)

Multuser, multiprocessor or multiprocessing cache systems

with cache invalidating means (G06F 12/0815 takes precedence)

with multilevel cache hierarchies

with a network or matrix configuration

Cache consistency protocols

using directory methods

[Associative directories (G06F 12/0822 takes precedence)]

[Copy directories (local copy tags for implementing a bus snooping protocol G06F 12/0831)]

[Distributed directories, e.g. linked lists of caches]

[Limited pointers directories; State-only directories without pointers]

[with concurrent directory accessing, i.e. handling multiple concurrent coherency transactions]

using a bus scheme, e.g. with bus monitoring or watching means

[in combination with broadcast means (e.g. for invalidation or updating)]

[for main memory peripheral accesses (e.g. I/O or DMA)]

[with concurrent directory accessing, i.e. handling multiple concurrent coherency transactions]

using a bus scheme, e.g. with bus monitoring or watching means

with software control, e.g. non-cacheable data

with a shared cache

for multiprocessor or multitasking

Multiple simultaneous or quasi-simultaneous cache accessing

Cache with multiple tag or data arrays being simultaneously accessible

{Partitioned cache, e.g. separate instruction and operand caches}

{Cache with interleaved addressing}

{Cache with multiport tag or data arrays}

Overlapped cache accessing, e.g. pipeline (G06F 12/0846 takes precedence)

{by multiple requestors}

{with reload from main memory}

with prefetch

using pseudo-associative means, e.g. set-associative or hashing

for peripheral storage systems, e.g. disk cache

Data transfer between cache memory and other subsystems, e.g. storage devices or host systems

Allocation or management of cache space

Mapping of cache memory to specific storage devices or parts thereof

with dedicated cache, e.g. instruction or stack

Cache access modes

Burst mode

Page mode

Parallel mode, e.g. in parallel with main memory or CPU

Variable-length word access

using selective caching, e.g. bypass

using clearing, invalidating or resetting means

Caches characterised by their organisation or structure

of parts of caches, e.g. directory or tag array

with two or more cache hierarchy levels (with multilevel cache hierarchies G06F 12/0811)

Address translation

using page tables, e.g. page table structures

involving hashing techniques, e.g. inverted page tables

using associative or pseudo-associative address translation means, e.g. translation look-aside buffer [TLB]

for multiple virtual address spaces, e.g. segmentation (G06F 12/1045 takes precedence)

associated with a data cache

{the data cache being concurrently physically addressed}

{the data cache being concurrently virtually addressed}

Decentralised address translation, e.g. in distributed shared memory systems

for peripheral access to main memory, e.g. direct memory access [DMA]

for multiple virtual address spaces, e.g. segmentation (G06F 12/1036 takes precedence)

Replacement control

using replacement algorithms

of the least frequently used [LFU] type, e.g. with individual count value

with age lists, e.g. queue, most recently used [MRU] list or least recently used [LRU] list

{being minimized, e.g. non MRU}

{being generated by decoding an array or storage}

with special data handling, e.g. priority of data or instructions, handling errors or pinning

using additional replacement algorithms

adapted to multidimensional cache systems, e.g. set-associative, multicache, multiset or multilevel

Protection against unauthorised use of memory {or access to memory}

(by using cryptography (for digital transmission H04L 9/00))

(by checking the object accessibility, e.g. type of access defined by the memory independently of subject rights (G06F 12/1458 takes precedence))

{the protection being physical, e.g. cell, word, block}

{for a module or a part of a module}

{for a range}
13/00 Interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units (interface circuits for specific input/output devices G06F 3/00; multiprocessor systems G06F 15/16 (multiprocessor control therefor G06F 9/46))

13/10 Program control for peripheral devices (G06F 13/14 - G06F 13/42 take precedence)

13/102 . . . [where the programme performs an interfacing function, e.g. device driver (G06F 13/105 takes precedence; scheduling within device drivers G06F 9/52; contention policies within device drivers G06F 9/4881)]

13/105 . . . [where the programme performs an input/output emulation function]

13/107 . . . [Terminal emulation]

13/12 . . . using hardware independent of the central processor, e.g. channel or peripheral processor

13/122 . . . [where hardware performs an I/O function other than control of data transfer]

13/124 . . . [where hardware is a sequential transfer control unit, e.g. microprocessor, peripheral processor or state-machine]

13/126 . . . . . . [and has means for transferring I/O instructions and statuses between control unit and main processor]

13/128 . . . . . . [for dedicated transfers to a network (for protocol converters G06F 13/387)]

13/14 . . . Handling requests for interconnection or transfer

13/16 . . . . . . for access to memory bus (G06F 13/28 takes precedence)

13/1605 . . . . . . [based on arbitration (arbitration in handling access to a common bus or bus system G06F 13/36)]

13/161 . . . . . . [with latency improvement]

13/1615 . . . . . . [using a concurrent pipeline structure]

13/1621 . . . . . . [by maintaining request order]

13/1626 . . . . . . [by reordering requests]

13/1631 . . . . . . . . . . . . . . . . . [through address comparison]

13/1636 . . . . . . [using refresh]

13/1642 . . . . . . [with request queuing]

13/1647 . . . . . . [with interleaved bank access]

13/1652 . . . . . . [in a multiprocessor architecture (interprocessor communication using common memory G06F 15/167)]

13/1657 . . . . . . . . . . . . . . . . . [Access to multiple memories]

13/1663 . . . . . . . . . . . . . . . . . [Access to shared memory]

13/1668 . . . . . . . . . . . . . . . . . [Details of memory controller]

13/1673 . . . . . . . . . . . . . . . . . [using buffers]

13/1678 . . . . . . . . . . . . . . . . . [using bus width]

13/1684 . . . . . . . . . . . . . . . . . [using multiple buses]

13/1689 . . . . . . . . . . . . . . . . . [Synchronisation and timing concerns (synchronisation on a memory bus G06F 13/4234)]

13/1694 . . . . . . . . . . . . . . . . . [Configuration of memory controller to different memory types]

13/18 . . . based on priority control (G06F 13/1605 takes precedence)

13/20 . . . for access to input/output bus

13/22 . . . . . . using successive scanning, e.g. polling (G06F 13/24 takes precedence)

13/225 . . . . . . [with priority control]

13/24 . . . . . . using interrupt (G06F 13/32 takes precedence)

13/26 . . . . . . with priority control

13/28 . . . . . . using burst mode transfer, e.g. direct memory access (DMA), cycle steal (G06F 13/32 takes precedence)

13/282 . . . . . . (Cycle stealing DMA (G06F 13/30 takes precedence))

13/285 . . . . . . (Halt stealing DMA (G06F 13/30 takes precedence))

13/287 . . . . . . (Multiplexed DMA (G06F 13/30 takes precedence))

13/30 . . . . . . with priority control

13/32 . . . . . . using combination of interrupt and burst mode transfer

13/34 . . . . . . with priority control

13/36 . . . . . . for access to common bus or bus system

13/362 . . . . . . with centralised access control

13/3625 . . . . . . [using a time dependent access]

13/364 . . . . . . using independent requests or grants, e.g. using separated request and grant lines

13/366 . . . . . . using a centralised polling arbiter

13/368 . . . . . . with decentralised access control

13/37 . . . . . . using a physical-position-dependent priority, e.g. daisy chain, round robin or token passing

13/372 . . . . . . using a time-dependent priority, e.g. individually loaded time counters or time slot

13/374 . . . . . . using a self-select method with individual priority code comparator

13/376 . . . . . . using a contention resolving method, e.g. collision detection, collision avoidance

13/378 . . . . . . using a parallel poll method

13/38 . . . . . . Information transfer, e.g. on bus (G06F 13/14 takes precedence)

13/382 . . . . . . [using universal interface adapter]

13/385 . . . . . . [for adaptation of a particular data processing system to different peripheral devices]

13/387 . . . . . . [for adaptation of different data processing systems to different peripheral devices, e.g. protocol converters for incompatible systems, open system]

13/40 . . . . . . Bus structure [(for computer networks G06F 15/163; for optical bus networks H04B 10/25)]

13/4004 . . . . . . [Coupling between buses]

13/4009 . . . . . . [with data restructuring]

13/4013 . . . . . . [with data re-ordering, e.g. Endian conversion]

13/4018 . . . . . . [with data-width conversion]

13/4022 . . . . . . [using switching circuits, e.g. switching matrix, connection or expansion network (G06F 13/4009 takes precedence)]

13/4027 . . . . . . [using bus bridges (G06F 13/4022 takes precedence)]
Digital computers in general
(data processing equipment in general)

15/00

15/02

[Digital computers in general (details G06F 1/00 – G06F 13/00): Data processing equipment in general]

15/0208

[for combination with other devices having a different main function, e.g. watches, pens]

15/0216

[Constructional details or arrangements]

15/0225

[User interface arrangements, e.g. keyboard, display; Interfaces to other computer systems]

15/0233

[with printing provisions]

15/0241

[of the IC-card-like type]

15/025

[adapted to a specific application]

15/0258

[for unit conversion]

15/0266

[for time management, e.g. calendars, diaries]

15/0275

[for measuring]

15/0283

[for data storage and retrieval]

15/0291

[for reading, e.g. e-books (constructional details of portable computers G06F 1/1613)]

15/04

[programmed simultaneously with the introduction of data to be processed, e.g. on the same record carrier]

15/08

[using a plugboard for programming]

15/10

[Tabulators]

15/12

[having provision for both printed and punched output]

15/14

[Calculating-punches]

15/16

[Combinations of two or more digital computers each having at least an arithmetic unit, a program unit and a register, e.g. for a simultaneous processing of several programs (coordinating program control therefor G06F 9/52; in regulating and control system G05B)]

15/161

[Computing infrastructure, e.g. computer clusters, blade chassis or hardware partitioning (casings, cabinets, racks or drawers for data centers H05K 5/00)]

15/163

[Interprocessor communication]

15/167

[using a common memory, e.g. mailbox]

15/17

[using an input/output type connection, e.g. channel, I/O port]

15/173

[using an interconnection network, e.g. matrix, shuffle, pyramid, star, snowflake]

15/17306

[Intercommunication techniques]

15/17312

[Routing techniques specific to parallel machines, e.g. wormhole, store and forward, shortest path problem congestion (routing on a LAN H04L 45/00)]

15/17318

[Parallel communications techniques, e.g. gather, scatter, reduce, broadcast, multicast, all to all]

15/17325

[Synchronisation; Hardware support therefor (intertask synchronisation G06F 9/52)]

15/17331

[Distributed shared memory [DSM], e.g. remote direct memory access [RDMA]]

15/17337

[Direct connection machines, e.g. completely connected computers, point to point communication networks (coupling between buses G06F 13/4004)]

15/17343

[wherein the interconnection is dynamically configurable, e.g. having loosely coupled nearest neighbor architecture (reconfigurable processors arrays G06F 15/7867)]

15/1735

[Network adapters, e.g. SCI, Myrinet (protocol engines H04L 29/06081)]

15/17356

[Indirect interconnection networks]

15/17362

[hierarchical topologies]
Initialisation or configuration control

Architectures of general purpose stored program computers

Indexing scheme relating to architectures of general purpose stored programme computers
16/156 . . . [Query results presentation]
16/16 . . . File or folder operations, e.g. details of user interfaces specifically adapted to file systems
16/162 . . . [Delete operations (erasing in storage systems G06F 3/0652)]
16/164 . . . [File meta data generation]
16/166 . . . [File name conversion]
16/168 . . . [Details of user interfaces specifically adapted to file systems, e.g. browsing and visualisation, 2d or 3d GUIs (query results presentation G06F 16/156)]
16/17 . . . Details of further file system functions
16/172 . . . Caching, prefetching or hoarding of files
16/1724 . . . [Details of de-fragmentation performed by the file system (saving storage space on storage systems G06F 3/0608; management of blocks in storage devices G06F 3/064)]
16/1727 . . . [Details of free space management performed by the file system (saving storage space on storage systems G06F 3/0608; management of blocks in storage devices G06F 3/064)]
16/173 . . . [Customisation support for file systems, e.g. localisation, multi-language support, personalisation]
16/1734 . . . [Details of monitoring file system events, e.g. by the use of hooks, filter drivers, logs]
16/1737 . . . [for reducing power consumption or coping with limited storage space, e.g. in mobile devices (saving storage space on storage systems G06F 3/0608; power saving in storage systems G06F 3/0625)]
16/174 . . . [Redundancy elimination performed by the file system (management of the data involved in backup or backup restore using de-duplication of the data G06F 11/14)]
16/1744 . . . [using compression, e.g. sparse files]
16/1748 . . . [De-duplication implemented within the file system, e.g. based on file segments (de-duplication techniques in storage systems for the management of data blocks G06F 3/064)]
16/1752 . . . . . . [based on file chunks]
16/1756 . . . . . . [based on delta files]
16/176 . . . Support for shared access to files; File sharing support
16/1767 . . . . . . [Concurrency control, e.g. optimistic or pessimistic approaches]
16/1774 . . . . . . [Locking methods, e.g. locking methods for file systems allowing shared and concurrent access to files]
16/178 . . . Techniques for file synchronisation in file systems
16/1787 . . . . . . [Details of non-transparently synchronising file systems]
16/1794 . . . . . . [Details of file format conversion]

**WARNING**

Group G06F 16/1794 is impacted by reclassification into group G06F 16/258.

Groups G06F 16/1794 and G06F 16/258 should be considered in order to perform a complete search.

16/18 . . . File system types

16/1805 . . . [Append-only file systems, e.g. using logs or journals to store data]
16/181 . . . . . . [providing write once read many [WORM] semantics]
16/1815 . . . [Journaling file systems]
16/182 . . . Distributed file systems
16/1824 . . . [implemented using Network-attached Storage [NAS] architecture (distributed or networked storage systems G06F 3/067; protocols for distributed storage of data in a network H04L 67/1097)]
16/1827 . . . . . . [Management specifically adapted to NAS (management of storage area networks [SAN] G06F 3/067)]
16/183 . . . . . . [ Provision of network file services by network file servers, e.g. by using NFS, CIFS (network file access protocols H06L 67/1097)]
16/1834 . . . . . . [implemented based on peer-to-peer networks, e.g. gnutella (p2p communication protocols H06L 67/104)]
16/1837 . . . . . . [Management specially adapted to peer-to-peer storage networks (topology management mechanisms of peer-to-peer networks H06L 67/1042)]
16/184 . . . . . . [implemented as replicated file system]
16/1844 . . . . . . [Management specifically adapted to replicated file systems]
16/1847 . . . . . . [specifically adapted to static storage, e.g. adapted to flash memory or SSD]
16/185 . . . Hierarchical storage management [HSM] systems, e.g. file migration or policies thereof (details of archiving G06F 16/11)]
16/1858 . . . . . . [Parallel file systems, i.e. file systems supporting multiple processors]
16/1865 . . . . . . [Transactional file systems]
16/1873 . . . . . . [Versioning file systems, temporal file systems, e.g. file system supporting different historic versions of files]
16/188 . . . Virtual file systems
16/192 . . . . . . [Implementing virtual folder structures]
16/196 . . . . . . [Specific adaptations of the file system to access devices and non-file objects via standard file system access operations, e.g. pseudo file systems (dedicated interfaces to storage systems G06F 3/0601)]
16/20 . . . . . . of structured data, e.g. relational data
16/21 . . . Design, administration or maintenance of databases
16/211 . . . . . . (Schema design and management)
16/212 . . . . . . [with details for data modelling support]
16/213 . . . . . . [with details for schema evolution support]
16/214 . . . . . . [Database migration support]
16/215 . . . . . . Improving data quality; Data cleansing, e.g. de-duplication, removing invalid entries or correcting typographical errors
16/217 . . . . . . [Database tuning (G06F 16/2282 takes precedence; database performance monitoring G06F 11/3409)]
16/219 . . . . . . [Managing data history or versioning (querying versioned data G06F 16/2474; querying temporal data G06F 16/2477)]
16/22 . . . . . . Indexing; Data structures therefor; Storage structures
16/2308 . . . [Concurrency control (transaction processing G06F 9/466)]

**WARNING**

Group G06F 16/2308 is impacted by reclassification into group G06F 16/25.
Groups G06F 16/23 and G06F 16/25 should be considered in order to perform a complete search.

16/2315 . . . [Optimistic concurrency control]

**WARNING**

Groups G06F 16/2315 - G06F 16/2329 are incomplete pending reclassification of documents from group G06F 16/2308.
Groups G06F 16/2308 and G06F 16/2315 - G06F 16/2329 should be considered in order to perform a complete search.

16/2322 . . . . . . . [using timestamps]
16/2329 . . . . . . . [using versioning]
16/2336 . . . . . . . [Pessimistic concurrency control approaches, e.g. locking or multiple versions without time stamps]

**WARNING**

Groups G06F 16/2336 and G06F 16/2343 are incomplete pending reclassification of documents from group G06F 16/2308.
Groups G06F 16/2308, G06F 16/2336, and G06F 16/2343 should be considered in order to perform a complete search.

16/2343 . . . . . . . [Locking methods, e.g. distributed locking or locking implementation details]
16/235 . . . . [Update request formulation]
16/2358 . . . . [Change logging, detection, and notification (replication G06F 16/221)]
16/2365 . . . . [Ensuring data consistency and integrity]

16/2372 . . . . . . . [Updates performed during offline database operations]
16/2379 . . . . . . . [Updates performed during online database operations; commit processing]
16/2386 . . . . . . . [Bulk updating operations (data conversion details G06F 16/258)]
16/2393 . . . . . . . [Updating materialised views]
16/24 . . . . . . . . Querying
16/242 . . . . . . . . Query formulation
16/2423 . . . . . . . . [Interactive query statement specification based on a database schema]
16/2425 . . . . . . . . [Iterative querying; Query formulation based on the results of a preceding query]
16/2428 . . . . . . . . [Query predicate definition using graphical user interfaces, including menus and forms (G06F 16/2423 takes precedence)]
16/243 . . . . . . . . [Natural language query formulation]
16/2433 . . . . . . . . [Query languages]
16/2435 . . . . . . . . [Active constructs]
16/2438 . . . . . . . . [Embedded query languages]
16/244 . . . . . . . . [Grouping and aggregation]
16/2443 . . . . . . . . [Stored procedures]
16/2445 . . . . . . . . [Data retrieval commands; View definitions]
16/2448 . . . . . . . . [for particular applications; for extensibility, e.g. user defined types]
16/245 . . . . . . . . Query processing
16/2452 . . . . . . . . Query translation
16/24522 . . . . . . . . [Translation of natural language queries to structured queries]
16/24524 . . . . . . . . [Access plan code generation and invalidation; Reuse of access plans]
16/24526 . . . . . . . . [Internal representations for queries]
16/24528 . . . . . . . . [Standardisation; Simplification]
16/2453 . . . . . . . . Query optimisation
16/24532 . . . . . . . . [of parallel queries]
16/24534 . . . . . . . . [Query rewriting; Transformation]
16/24535 . . . . . . . . [of sub-queries or views]
16/24537 . . . . . . . . [of operators]
16/24539 . . . . . . . . [using cached or materialised query results]
16/2454 . . . . . . . . [Optimisation of common expressions]
16/24542 . . . . . . . . [Plan optimisation]
16/24544 . . . . . . . . [Join order optimisation]
16/24545 . . . . . . . . [Selectivity estimation or determination]
16/24547 . . . . . . . . [Optimisations to support specific applications; Extensibility of optimisers]
16/24549 . . . . . . . . [Run-time optimisation]
16/2455 . . . . . . . . Query execution
16/24552 . . . . . . . . [Database cache management]
16/24553 . . . . . . . . [of query operations]
16/24554 . . . . . . . . [Unary operations; Data partitioning operations]
16/24556 . . . . . . . . [Aggregation; Duplicate elimination]
16/24557 . . . . . . . . [Efficient disk access during query execution]
16/24558 . . . . . . . . [Binary matching operations]
16/2456 . . . . . . . . [Join operations]
16/24561 . . . . . . . . [Intermediate data storage techniques for performance improvement]
16/24562 . . . . . . { Pointer or reference processing operations }
16/24564 . . . . . . { Applying rules; Deductive queries }
16/24565 . . . . . . { Triggers; Constraints }
16/24566 . . . . . . { Recursive queries }
16/24568 . . . . . . { Data stream processing; Continuous queries }
16/24569 . . . . . . { Query processing with adaptation to specific hardware, e.g. adapted for using GPUs or SSDs }
16/2457 . . . . . . with adaptation to user needs
16/24573 . . . . . . { using data annotations, e.g. user-defined metadata }
16/24575 . . . . . . { using context }
16/24578 . . . . . . { using ranking }
16/2458 . . . . . . Special types of queries, e.g. statistical queries, fuzzy queries or distributed queries
16/2462 . . . . . . { Approximate or statistical queries }
16/2465 . . . . . . { Query processing support for facilitating data mining operations in structured databases }
16/2468 . . . . . . { Fuzzy queries }
16/2471 . . . . . . { Distributed queries }
16/2474 . . . . . . { Sequence data queries, e.g. querying versioned data }
16/2477 . . . . . . { Temporal data queries }
16/248 . . . . . . Presentation of query results
16/25 . . . . Integrating or interfacing systems involving database management systems

**WARNING**

Group G06F 16/25 is incomplete pending reclassification of documents from group G06F 16/23.

Groups G06F 16/23 and G06F 16/25 should be considered in order to perform a complete search.

16/252 . . . . . . { between a Database Management System and a front-end application }
16/254 . . . . . . { Extract, transform and load [ETL] procedures, e.g. ETL data flows in data warehouses }
16/256 . . . . . . { in federated or virtual databases }
16/258 . . . . . . { Data format conversion from or to a database }

**WARNING**

Groups G06F 16/258 is incomplete pending reclassification of documents from group G06F 16/1794.

Groups G06F 16/1794 and G06F 16/258 should be considered in order to perform a complete search.

16/26 . . . . Visual data mining; Browsing structured data

16/27 . . . . Replication, distribution or synchronisation of data between databases or within a distributed database system; Distributed database system architectures therefor

**WARNING**

Group G06F 16/27 is impacted by reclassification into groups G06F 16/273, G06F 16/275, and G06F 16/278.

All groups listed in this Warning should be considered in order to perform a complete search.

16/273 . . . . { Asynchronous replication or reconciliation }

**WARNING**

Groups G06F 16/273 is incomplete pending reclassification of documents from group G06F 16/27.

Groups G06F 16/27 and G06F 16/273 should be considered in order to perform a complete search.

16/275 . . . . { Synchronous replication }

**WARNING**

Groups G06F 16/275 is incomplete pending reclassification of documents from group G06F 16/27.

Groups G06F 16/27 and G06F 16/275 should be considered in order to perform a complete search.

16/278 . . . . { Data partitioning, e.g. horizontal or vertical partitioning }

**WARNING**

Groups G06F 16/278 is incomplete pending reclassification of documents from group G06F 16/27.

Groups G06F 16/27 and G06F 16/278 should be considered in order to perform a complete search.

16/28 . . . . Databases characterised by their database models, e.g. relational or object models
16/282 . . . . { Hierarchical databases, e.g. IMS, LDAP data stores or Lotus Notes }
16/283 . . . . { Multi-dimensional databases or data warehouses, e.g. MOLAP or ROLAP }
16/284 . . . . { Relational databases }
16/285 . . . . { Clustering or classification }
16/287 . . . . { Visualization; Browsing }
16/288 . . . . { Entity relationship models }
16/289 . . . . { Object oriented databases }
16/29 . . . . Geographical information databases
16/30 . . . . of unstructured textual data (document management systems G06F 16/93)

**NOTE**

In groups G06F 16/30, G06F 16/31, G06F 16/313, G06F 16/316, G06F 16/319, G06F 16/322, G06F 16/325, G06F 16/328, G06F 16/33, G06F 16/332, G06F 16/3322, G06F 16/3323, G06F 16/3324, G06F 16/3325, G06F 16/3326, G06F 16/3328, G06F 16/3329, G06F 16/3331, G06F 16/3332, G06F 16/3334, G06F 16/3335.
subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/38, G06F 16/381, G06F 16/382, G06F 16/383, and G06F 16/387.

16/31 . . . Indexing; Data structures therefor; Storage structures
16/313 . . . {Selection or weighting of terms for indexing}
16/316 . . . {Indexing structures}
16/319 . . . {Inverted lists}
16/322 . . . {Trees}
16/325 . . . {Hash tables}
16/328 . . . {Management therefor}
16/33 . . . Querying
16/332 . . . Query formulation
16/3322 . . . {using system suggestions (G06F 16/3325 takes precedence)}
16/3323 . . . {using document space presentation or visualization, e.g. category, hierarchy or range presentation and selection}
16/3325 . . . {Reformulation based on results of preceding query}
16/3326 . . . {using relevance feedback from the user, e.g. relevance feedback on documents, documents sets, document terms or passages}
16/3328 . . . {using graphical result space presentation or visualisation}
16/3329 . . . {Natural language query formulation or dialogue systems}
16/3331 . . . {Query processing}
16/3332 . . . {Query translation}
16/3334 . . . {Selection or weighting of terms from queries, including natural language queries}
16/3335 . . . {Syntactic pre-processing, e.g. stopword elimination, stemming}
16/3337 . . . {Translation of the query language, e.g. Chinese to English}
16/3338 . . . {Query expansion}
16/334 . . . {Query execution (G06F 16/335 takes precedence)}
16/3341 . . . {using boolean model}
16/3343 . . . {using phonetics}
16/3344 . . . {using natural language analysis}
16/3346 . . . {using probabilistic model}
16/3347 . . . {using vector based model}
16/3349 . . . {Reuse of stored results of previous queries}
16/335 . . . Filtering based on additional data, e.g. user or group profiles (filtering in web context G06F 16/9535, G06F 16/9536)
16/337 . . . {Profile generation, learning or modification}
16/338 . . . Presentation of query results
16/34 . . . Browsing; Visualisation therefor
16/345 . . . {Summarisation for human users}
WARNING
Group G06F 16/40 is impacted by reclassification into groups G06F 16/45, G06F 16/48, G06F 16/483, G06F 16/487, and G06F 16/489.
All groups listed in this Warning should be considered in order to perform a complete search.

16/41 . . . Indexing; Data structures therefor; Storage structures
16/43 . . . Querying

WARNING
Group G06F 16/43 is impacted by reclassification into groups G06F 16/432, G06F 16/48, G06F 16/483, G06F 16/487, and G06F 16/489.
All groups listed in this Warning should be considered in order to perform a complete search.

16/432 . . . Query formulation

WARNING
Group G06F 16/432 is incomplete pending reclassification of documents from group G06F 16/43.
Groups G06F 16/43 and G06F 16/432 should be considered in order to perform a complete search.

16/433 . . . [using audio data]
16/434 . . . [using image data, e.g. images, photos, pictures taken by a user]
16/435 . . . Filtering based on additional data, e.g. user or group profiles
16/436 . . . [using biological or physiological data of a human being, e.g. blood pressure, facial expression, gestures]
16/437 . . . [Administration of user profiles, e.g. generation, initialisation, adaptation, distribution]
16/438 . . . Presentation of query results
16/437 . . . [by the use of playlists]
16/439 . . . [Multimedia presentations, e.g. slide shows, multimedia albums]
16/44 . . . Browsing; Visualisation therefor
16/444 . . . [Spatial browsing, e.g. 2D maps, 3D or virtual spaces]
16/447 . . . [Temporal browsing, e.g. timeline]
16/45 . . . Clustering; Classification

WARNING
Group G06F 16/45 is incomplete pending reclassification of documents from group G06F 16/40.
Groups G06F 16/40 and G06F 16/45 should be considered in order to perform a complete search.

16/48 . . . Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually

WARNING
Group G06F 16/48 is incomplete pending reclassification of documents from groups G06F 16/40 and G06F 16/43.
Groups G06F 16/40, G06F 16/43, and G06F 16/48 should be considered in order to perform a complete search.

16/483 . . . using metadata automatically derived from the content

WARNING
Group G06F 16/483 is incomplete pending reclassification of documents from groups G06F 16/40 and G06F 16/43.
Groups G06F 16/40, G06F 16/43, and G06F 16/483 should be considered in order to perform a complete search.

16/487 . . . using geographical or spatial information, e.g. location

WARNING
Group G06F 16/487 is incomplete pending reclassification of documents from groups G06F 16/40 and G06F 16/43.
Groups G06F 16/40, G06F 16/43, and G06F 16/487 should be considered in order to perform a complete search.

16/489 . . . [using time information]

WARNING
Group G06F 16/489 is incomplete pending reclassification of documents from groups G06F 16/40 and G06F 16/43.
Groups G06F 16/40, G06F 16/43, and G06F 16/489 should be considered in order to perform a complete search.

16/50 . . . of still image data

NOTE
In groups G06F 16/50, G06F 16/51, G06F 16/53, G06F 16/532, G06F 16/535, G06F 16/538, G06F 16/54, G06F 16/55 and G06F 16/56, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/58, G06F 16/583, G06F 16/5838, G06F 16/5846, G06F 16/5854, G06F 16/5862 and G06F 16/587.

WARNING
Group G06F 16/50 is impacted by reclassification into groups G06F 16/53, G06F 16/532, G06F 16/535, G06F 16/538, and G06F 16/55.
All groups listed in this Warning should be considered in order to perform a complete search.
16/51 . . Indexing; Data structures therefor; Storage structures
16/53 . . Querying

**WARNING**
Group G06F 16/53 is incomplete pending reclassification of documents from group G06F 16/50.
Groups G06F 16/50 and G06F 16/53 should be considered in order to perform a complete search.

16/532 . . Query formulation, e.g. graphical querying

**WARNING**
Group G06F 16/532 is incomplete pending reclassification of documents from group G06F 16/50.
Groups G06F 16/50 and G06F 16/532 should be considered in order to perform a complete search.

16/535 . . Filtering based on additional data, e.g. user or group profiles

**WARNING**
Group G06F 16/535 is incomplete pending reclassification of documents from group G06F 16/50.
Groups G06F 16/50 and G06F 16/535 should be considered in order to perform a complete search.

16/538 . . Presentation of query results

**WARNING**
Group G06F 16/538 is incomplete pending reclassification of documents from group G06F 16/50.
Groups G06F 16/50 and G06F 16/538 should be considered in order to perform a complete search.

16/54 . . Browsing; Visualisation therefor
16/55 . . Clustering; Classification

**WARNING**
Group G06F 16/55 is incomplete pending reclassification of documents from group G06F 16/50.
Groups G06F 16/50 and G06F 16/55 should be considered in order to perform a complete search.

16/56 . . having vectorial format
16/58 . . Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually

**WARNING**
Group G06F 16/58 is impacted by reclassification into group G06F 16/587.
Groups G06F 16/58 and G06F 16/587 should be considered in order to perform a complete search.

16/583 . . using metadata automatically derived from the content
16/5838 . . [using colour]

**WARNING**
Group G06F 16/5838 is impacted by reclassification into groups G06F 16/5846, G06F 16/5854, and G06F 16/5862.
All groups listed in this Warning should be considered in order to perform a complete search.

16/5846 . . [using extracted text]

**WARNING**
Group G06F 16/5846 is incomplete pending reclassification of documents from group G06F 16/5838.
Groups G06F 16/5838 and G06F 16/5846 should be considered in order to perform a complete search.

16/5854 . . [using shape and object relationship]

**WARNING**
Group G06F 16/5854 is incomplete pending reclassification of documents from group G06F 16/5838.
Groups G06F 16/5838 and G06F 16/5854 should be considered in order to perform a complete search.

16/5862 . . [using texture]

**WARNING**
Group G06F 16/5862 is incomplete pending reclassification of documents from group G06F 16/5838.
Groups G06F 16/5838 and G06F 16/5862 should be considered in order to perform a complete search.

16/5866 . . [using information manually generated, e.g. tags, keywords, comments, manually generated location and time information]

**WARNING**
Group G06F 16/5866 is impacted by reclassification into group G06F 16/587.
Groups G06F 16/5866 and G06F 16/587 should be considered in order to perform a complete search.

16/587 . . using geographical or spatial information, e.g. location

**WARNING**
Group G06F 16/587 is incomplete pending reclassification of documents from groups G06F 16/58 and G06F 16/5866.
Groups G06F 16/58, G06F 16/5866, and G06F 16/587 should be considered in order to perform a complete search.
NOTE
In groups G06F 16/60, G06F 16/61, G06F 16/63, G06F 16/632, G06F 16/634, G06F 16/635, G06F 16/636, G06F 16/637, G06F 16/638, G06F 16/639, G06F 16/64, and G06F 16/65, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/68, G06F 16/683, G06F 16/685, G06F 16/686 and G06F 16/687.

WARNING
Group G06F 16/60 is impacted by reclassification into groups G06F 16/63 and G06F 16/65.
Groups G06F 16/60, G06F 16/63, and G06F 16/65 should be considered in order to perform a complete search.

16/63 . . . Querying

WARNING
Group G06F 16/63 is incomplete pending reclassification of documents from group G06F 16/60.
Groups G06F 16/60 and G06F 16/63 should be considered in order to perform a complete search.

16/632 . . . Query formulation
16/634 . . . [Query by example, e.g. query by humming]
16/635 . . . Filtering based on additional data, e.g. user or group profiles
16/636 . . . [by using biological or physiological data]
16/637 . . . [Administration of user profiles, e.g. generation, initialization, adaptation or distribution]
16/638 . . . Presentation of query results
16/639 . . . [using playlists]
16/64 . . . Browsing; Visualisation therefor (generation of a list or set of audio data G06F 16/638)
16/65 . . . Clustering; Classification

WARNING
Group G06F 16/65 is incomplete pending reclassification of documents from group G06F 16/60.
Groups G06F 16/60 and G06F 16/65 should be considered in order to perform a complete search.

16/68 . . . Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually

WARNING
Group G06F 16/68 is impacted by reclassification into group G06F 16/687.
Groups G06F 16/68 and G06F 16/687 should be considered in order to perform a complete search.

16/683 . . . using metadata automatically derived from the content
16/685 . . . [using automatically derived transcript of audio data, e.g. lyrics (speech recognition G10L 15/00)]
16/686 . . . [using information manually generated, e.g. tags, keywords, comments, title or artist information, time, location or usage information, user ratings]

WARNING
Group G06F 16/686 is incomplete pending reclassification of documents from groups G06F 16/68 and G06F 16/686.
Groups G06F 16/686, G06F 16/686, and G06F 16/687 should be considered in order to perform a complete search.

16/69 . . . using geographical or spatial information, e.g. location

WARNING
Group G06F 16/687 is incomplete pending reclassification of documents from groups G06F 16/68 and G06F 16/686.
Groups G06F 16/68, G06F 16/686, and G06F 16/687 should be considered in order to perform a complete search.

16/70 . . . of video data

NOTE
In groups G06F 16/70, G06F 16/71, G06F 16/72, G06F 16/7, G06F 16/73, G06F 16/732, G06F 16/728, G06F 16/733, G06F 16/734, G06F 16/735, G06F 16/738, G06F 16/739, G06F 16/74, G06F 16/743, G06F 16/745, G06F 16/78, and G06F 16/75, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/78, G06F 16/783, G06F 16/7834, G06F 16/7837, G06F 16/784, G06F 16/7844, G06F 16/7847, G06F 16/785, G06F 16/7854, G06F 16/7857, G06F 16/786, G06F 16/7864, G06F 16/7867 and G06F 16/787.

WARNING
Group G06F 16/70 is impacted by reclassification into group G06F 16/75.
Groups G06F 16/70 and G06F 16/75 should be considered in order to perform a complete search.

16/71 . . . Indexing; Data structures therefor; Storage structures
Querying

**WARNING**

Group G06F 16/73 is impacted by reclassification into group G06F 16/732.

Groups G06F 16/73 and G06F 16/732 should be considered in order to perform a complete search.

Query formulation

**WARNING**

Group G06F 16/732 is incomplete pending reclassification of documents from group G06F 16/73.

Groups G06F 16/73 and G06F 16/732 should be considered in order to perform a complete search.

Query by example, e.g. a complete video frame or video sequence (graphical querying G06F 16/7335)

Graphical querying, e.g. query-by-region, query-by-sketch, query-by-trajectory, GUIs for designating a person/face/object as a query predicate (end-user interface involving hot spots associated with the video H04N 21/4725; end-user interface for selecting a Region of Interest H04N 21/4728)

Filtering based on additional data, e.g. user or group profiles

Presentation of query results

[Query by example, e.g. a complete video frame or video sequence (graphical querying G06F 16/7335)]

[Graphical querying, e.g. query-by-region, query-by-sketch, query-by-trajectory, GUIs for designating a person/face/object as a query predicate (end-user interface involving hot spots associated with the video H04N 21/4725; end-user interface for selecting a Region of Interest H04N 21/4728)]

Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually

**WARNING**

Group G06F 16/78 is impacted by reclassification into group G06F 16/787.

Groups G06F 16/78 and G06F 16/787 should be considered in order to perform a complete search.

Using metadata automatically derived from the content

[using audio features]

[using objects detected or recognised in the video content]

[the detected or recognised objects being people]

[using original textual content or text extracted from visual content or transcript of audio data]

[using low-level visual features of the video content]

[using colour or luminescence]

[using shape (G06F 16/7837 takes precedence)]

[using texture (G06F 16/7837 takes precedence)]

[using motion, e.g. object motion or camera motion]

[using domain-transform features, e.g. DCT or wavelet transform coefficients]

[using information manually generated, e.g. tags, keywords, comments, title and artist information, manually generated time, location and usage information, user ratings]

**WARNING**

Group G06F 16/7867 is impacted by reclassification into group G06F 16/787.

Groups G06F 16/7867 and G06F 16/787 should be considered in order to perform a complete search.

[using geographical or spatial information, e.g. location]

**WARNING**

Group G06F 16/787 is incomplete pending reclassification of documents from groups G06F 16/78 and G06F 16/787.

Groups G06F 16/78, G06F 16/7867, and G06F 16/787 should be considered in order to perform a complete search.

[using information manually generated, e.g. tags, keywords, comments, title and artist information, manually generated time, location and usage information, user ratings]

**WARNING**

Group G06F 16/7867 is impacted by reclassification into group G06F 16/787.

Groups G06F 16/7867 and G06F 16/787 should be considered in order to perform a complete search.

Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually

**WARNING**

Group G06F 16/78 is impacted by reclassification into group G06F 16/787.

Groups G06F 16/78 and G06F 16/787 should be considered in order to perform a complete search.

[using information manually generated, e.g. tags, keywords, comments, title and artist information, manually generated time, location and usage information, user ratings]
16/81 Indexing, e.g. XML tags; Data structures therefor; Storage structures

**WARNING**
Group G06F 16/81 is incomplete pending reclassification of documents from group G06F 16/83.
Groups G06F 16/83 and G06F 16/81 should be considered in order to perform a complete search.

16/83 Querying

**WARNING**
Group G06F 16/83 is impacted by reclassification into groups G06F 16/81 and G06F 16/835.
Groups G06F 16/83, G06F 16/81, and G06F 16/835 should be considered in order to perform a complete search.

16/832 Query formulation

16/835 Query processing

**WARNING**
Group G06F 16/835 is incomplete pending reclassification of documents from group G06F 16/83.
Groups G06F 16/83 and G06F 16/835 should be considered in order to perform a complete search.

16/838 Presentation of query results

16/84 Mapping; Conversion

16/86 Clustering; Classification

**WARNING**
Group G06F 16/835 is incomplete pending reclassification of documents from group G06F 16/83.
Groups G06F 16/83 and G06F 16/835 should be considered in order to perform a complete search.

16/90 Details of database functions independent of the retrieved data types

**NOTE**
In groups G06F 16/90, G06F 16/901, G06F 16/904, G06F 16/907, G06F 16/9014, G06F 16/9017, G06F 16/902, G06F 16/9024, G06F 16/9027, G06F 16/903, G06F 16/9032, G06F 16/90324, G06F 16/90328, G06F 16/90332, G06F 16/90335, G06F 16/90339, G06F 16/90344, G06F 16/90348, G06F 16/9035, G06F 16/90355, G06F 16/90358, G06F 16/904, and G06F 16/906, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/907, G06F 16/909, and G06F 16/909.

**WARNING**
Group G06F 16/90 is impacted by reclassification into group G06F 16/906.
Groups G06F 16/90 and G06F 16/906 should be considered in order to perform a complete search.

16/901 Indexing; Data structures therefor; Storage structures (for retrieval from the web G06F 16/951)

16/9014 [hash tables]

16/9017 [using directory or table look-up (use of a directory or look-up table in file systems G06F 16/13)]

16/902 [using more than one table in sequence, i.e. systems with three or more layers]

16/9024 [Graphs; Linked lists (G06F 16/9027 takes precedence)]

16/9027 [Trees]

16/903 Querying (for retrieval from the web G06F 16/953)

**WARNING**
Group G06F 16/903 is impacted by reclassification into group G06F 16/9035.
Groups G06F 16/903 and G06F 16/9035 should be considered in order to perform a complete search.

16/9032 Query formulation

16/90324 [using system suggestions]

16/90328 [using search space presentation or visualization, e.g. category or range presentation and selection]

16/90332 [Natural language query formulation or dialogue systems]

16/90335 [Query processing]

16/90339 [by using parallel associative memories or content-addressable memories]

16/90344 [by using string matching techniques]

16/90348 [by searching ordered data, e.g. alpha-numerically ordered data]

16/9035 Filtering based on additional data, e.g. user or group profiles

**WARNING**
Group G06F 16/9035 is incomplete pending reclassification of documents from group G06F 16/903.
Groups G06F 16/903 and G06F 16/9035 should be considered in order to perform a complete search.

16/9038 Presentation of query results

16/904 Browsing; Visualisation therefor (for navigating the web G06F 16/954; browsing optimisation for the web G06F 16/957)

16/906 Clustering; Classification

**WARNING**
Group G06F 16/906 is incomplete pending reclassification of documents from group G06F 16/90.
Groups G06F 16/90 and G06F 16/906 should be considered in order to perform a complete search.
16/907 . . . Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually

**WARNING**

Group G06F 16/907 is impacted by reclassification into groups G06F 16/908 and G06F 16/909.

Groups G06F 16/907, G06F 16/908, and G06F 16/909 should be considered in order to perform a complete search.

16/908 . . . using metadata automatically derived from the content

**WARNING**

Group G06F 16/908 is incomplete pending reclassification of documents from group G06F 16/907.

Groups G06F 16/907 and G06F 16/908 should be considered in order to perform a complete search.

16/909 . . . using geographical or spatial information, e.g. location (spatiotemporally dependent retrieval from the web G06F 16/9537)

**WARNING**

Group G06F 16/909 is incomplete pending reclassification of documents from group G06F 16/907.

Groups G06F 16/907 and G06F 16/909 should be considered in order to perform a complete search.

16/93 . . . Document management systems
16/94 . . . Hyperlinking G06F 40/134
16/95 . . . Retrieval from the web
16/951 . . . Indexing; Web crawling techniques

**WARNING**

Group G06F 16/951 is impacted by reclassification into groups G06F 16/953, G06F 16/9532 and G06F 16/9538.

All groups listed in this Warning should be considered in order to perform a complete search.

16/953 . . . Querying, e.g. by the use of web search engines

**WARNING**

Group G06F 16/953 is incomplete pending reclassification of documents from group G06F 16/951.

Groups G06F 16/951 and G06F 16/953 should be considered in order to perform a complete search.

16/952 . . . Query formulation

**WARNING**

Group G06F 16/952 is incomplete pending reclassification of documents from group G06F 16/951.

Groups G06F 16/951 and G06F 16/952 should be considered in order to perform a complete search.

16/9535 . . . Search customisation based on user profiles and personalisation

**WARNING**

Group G06F 16/9535 is incomplete pending reclassification of documents from group G06F 16/9536 and G06F 16/9538.

Groups G06F 16/9535, G06F 16/9536, and G06F 16/9538 should be considered in order to perform a complete search.

16/9536 . . . Search customisation based on social or collaborative filtering

**WARNING**

Group G06F 16/9536 is incomplete pending reclassification of documents from group G06F 16/9535.

Groups G06F 16/9535 and G06F 16/9536 should be considered in order to perform a complete search.

16/9537 . . . Spatial or temporal dependent retrieval, e.g. spatiotemporal queries
16/9538 . . . Presentation of query results

**WARNING**

Group G06F 16/9538 is incomplete pending reclassification of documents from groups G06F 16/951 and G06F 16/9535.

Groups G06F 16/951, G06F 16/9535, and G06F 16/9538 should be considered in order to perform a complete search.

16/954 . . . Navigation, e.g. using categorised browsing
16/955 . . . using information identifiers, e.g. uniform resource locators [URL]
16/9554 . . . [by using bar codes]
16/9558 . . . [Details of hyperlinks; Management of linked annotations]
16/9562 . . . [Bookmark management]
16/9566 . . . [URL specific, e.g. using aliases, detecting broken or misspelled links]
16/957 . . . Browsing optimisation, e.g. caching or content distillation
16/9574 . . . [of access to content, e.g. by caching]
16/9577 . . . [Optimising the visualisation of content, e.g. distillation of HTML documents]
16/958 . . . Organisation or management of web site content, e.g. publishing, maintaining pages or automatic linking
16/972 . . . [Access to data in other repository systems, e.g. legacy data or dynamic Web page generation]
Digital computing or data processing equipment or methods, specially adapted for specific functions (information retrieval, database structures or file system structures therefor G06F 16/00)

Complex mathematical operations \{ function generation by table look-up G06F 1/03; evaluation of elementary functions by calculation G06F 7/544\}

for solving equations \{ e.g. nonlinear equations, general mathematical optimization problems (optimization specially adapted for a specific administrative, business or logistic context G06Q 10/04) \}

Simultaneous equations \{ e.g. systems of linear equations \}

Differential equations (using digital differential analysers G06F 7/64)

Fourier, Walsh or analogous domain transformations \{ e.g. Laplace, Hilbert, Karhunen-Loeve, transforms (for correlation function computation G06F 17/156; spectrum analysers G01R 23/16) \}

[Discrete Fourier transforms]

[Fast Fourier transforms, e.g. using a Cooley-Tukey type algorithm]

[Prime factor Fourier transforms, e.g. Winograd transforms, number theoretic transforms]

[Square transforms, e.g. Hadamard, Walsh, Haar, Hough, Slant transforms]

[Discrete orthonormal transforms, e.g. discrete cosine transform, discrete sine transform, and variations therefrom, e.g. modified discrete cosine transform, integer transforms approximating the discrete cosine transform (G06F 17/145 takes precedence)]

[Wavelet transforms]

Correlation function computation \{ including computation of convolution operations (arithmetic circuits for sum of products per se, e.g. multiply-accumulators G06F 7/544; digital filters, e.g. FIR, IIR, adaptive filters H03H 17/00) \}

[Discrete orthonormal correlation or convolution]

[using a domain transform, e.g. Fourier transform, polynomial transform, number theoretic transform]

Matrix or vector computation \{ e.g. matrix-matrix or matrix-vector multiplication, matrix factorization (matrix transposition G06F 7/78) \}

Function evaluation by approximation methods, e.g. inter- or extrapolation, smoothing, least mean square method ((G06F 17/18 takes precedence) \{ interpolation for numerical control G05B 19/18 \}

[of multidimensional data]

for evaluating statistical data \{ e.g. average values, frequency distributions, probability functions, regression analysis (forecasting specially adapted for a specific administrative, business or logistic context G06Q 10/04) \}

Data acquisition and logging \{ for input to computer G06F 3/00 \{ displays as computer output G06F 3/14; for image data processing G06T 9/00; compression in general H03M 7/30; for transmission H04B 1/66; for pictorial communication H04N; arrangements in telecontrol or telemetry systems for selectively calling a substation from a main station H04Q 9/00) \}

**WARNING**

This group is no longer used for the classification of new documents. The documents are classified in the application fields according to the references above

Digital computing or data processing equipment or methods, specially adapted for specific applications (specially adapted for specific functions G06F 17/00; data processing systems or methods specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes G06Q; healthcare informatics G16H)

**WARNING**

Group G06F 19/00 is no longer used for the classification of documents as of 02-01-2019. The content of this group is being reclassified into group G16Z 99/00.

Groups G06F 19/00 and G16Z 99/00 should be considered in order to perform a complete search.

Medical informatics, i.e. computer-based analysis or dissemination of patient or disease data (measuring for diagnostic purposes A61B 5/00; recognising patterns in biomedical signals G06K 9/00; data processing systems or methods specially adapted for administrative or managerial aspects of healthcare or welfare G06Q 50/22)

**WARNING**

Group G06F 19/30 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 10/00 – G16H 80/00.

Groups G06F 19/30 and G16H 10/00 – G16H 80/00 should be considered in order to perform a complete search.

Medical data management, e.g. systems or protocols for archival or communication of medical images, computerised patient records or computerised general medical references (information retrieval or databases per se G06F 16/00; data security aspects G06F 21/00)

**WARNING**

Group G06F 19/32 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 10/00 – G16H 80/00.

Groups G06F 19/32 and G16H 10/00 – G16H 80/00 should be considered in order to perform a complete search.
WARNING

Group G06F 19/321 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 30/00 – G16H 30/40.

Groups G06F 19/321 and G16H 30/00 – G16H 30/40 should be considered in order to perform a complete search.

WARNING

Group G06F 19/324 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 70/00 and G16H 70/60.

Groups G06F 19/324, G16H 70/00, and G16H 70/60 should be considered in order to perform a complete search.

WARNING

Group G06F 19/325 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 70/20 and G16H 70/60.

Groups G06F 19/325, G16H 70/20, and G16H 70/60 should be considered in order to perform a complete search.

WARNING

Group G06F 19/326 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 70/40 and G16H 70/60.

Groups G06F 19/326, G16H 70/40, and G16H 70/60 should be considered in order to perform a complete search.

WARNING

Group G06F 19/328 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G06Q 10/10 and G06Q 40/00.

Groups G06F 19/328, G06Q 10/10 and G06Q 40/00 should be considered in order to perform a complete search.

WARNING

Group G06F 19/34 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 10/00 – G16H 80/00. Groups G06F 19/34 and G16H 10/00 – G16H 80/00 should be considered in order to perform a complete search.

Groups G06F 19/34 and G16H 10/00 – G16H 80/00 should be considered in order to perform a complete search.

WARNING

Group G06F 19/3418 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 40/40, G16H 40/60, and G16H 40/67.

Groups G06F 19/3418, G16H 40/40, G16H 40/60, and G16H 40/67 should be considered in order to perform a complete search.

WARNING

Group G06F 19/3456 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 20/10, G16H 20/60, G16H 20/70, and G16H 20/90.

All groups listed in this Warning should be considered in order to perform a complete search.
19/3462 \[\text{Frozen}\] . . . \{Computer-assisted distribution of medication from dispensers, i.e. making sure that medication is correctly delivered to patients (medication containers A61J 1/00; dispensers activated by money or the like G07F)\}

**WARNING**

Group G06F 19/3462 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 20/13, G16H 20/60, G16H 20/70, and G16H 20/90.

All groups listed in this Warning should be considered in order to perform a complete search.

19/3468 \[\text{Frozen}\] . . . \{Computer-assisted delivery of medication via infusion or injection (infusion devices per se A61M 5/14)\}

**WARNING**

Group G06F 19/3468 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 20/17, G16H 20/60, G16H 20/70, and G16H 20/90.

All groups listed in this Warning should be considered in order to perform a complete search.

19/3475 \[\text{Frozen}\] . . . \{Computer-assisted prescription or delivery of diets, e.g. prescription filling or compliance checking\}

**WARNING**

Group G06F 19/3475 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 20/60, G16H 20/70 and G16H 20/90.

Groups G06F 19/3475, G16H 20/60, G16H 20/70 and G16H 20/90 should be considered in order to perform a complete search.

19/3481 \[\text{Frozen}\] . . . \{Computer-assisted prescription or delivery of treatment by physical action, e.g. surgery or physical exercise (surgical instruments, devices or methods A61B 17/00; apparatuses for physical training A63B)\}

**WARNING**

Group G06F 19/3481 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 20/30, G16H 20/40, G16H 20/70 and G16H 20/90.

Groups G06F 19/3481, G16H 20/30, G16H 20/40, G16H 20/70 and G16H 20/90 should be considered in order to perform a complete search.

19/36 \[\text{Frozen}\] . . . \{Computer-assisted acquisition of medical data, e.g. computerised clinical trials or questionnaires (measuring analogue medical signals A61B 5/00)\}

**WARNING**

Group G06F 19/36 is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups G16H 10/00 – G16H 10/40.

Groups G06F 19/36 and G16H 10/00 – G16H 10/40 should be considered in order to perform a complete search.

21/00 Security arrangements for protecting computers, components thereof, programs or data against unauthorised activity

21/10 . Protecting distributed programs or content, e.g. vending or licensing of copyrighted material
21/105 . \{Tools for software license management or administration, e.g. managing licenses at corporate level\}
21/12 . Protecting executable software
21/121 . \{Restricting unauthorised execution of programs\}
21/123 . \{by using dedicated hardware, e.g. dongles, smart cards, cryptographic processors, global positioning systems [GPS] devices\}
21/125 . \{by manipulating the program code, e.g. source code, compiled code, interpreted code, machine code\}
21/126 . . . \{Interacting with the operating system\}
21/128 . . . \{involving web programs, i.e. using technology especially used in internet, generally interacting with a web browser, e.g. hypertext markup language [HTML], applets, java\}
21/14 . . . against software analysis or reverse engineering, e.g. by obfuscation
21/16 . . . Program or content traceability, e.g. by watermarking
21/30 . Authentication, i.e. establishing the identity or authorisation of security principals
21/305 . \{by remotely controlling device operation\}
21/31 . . . User authentication
21/313 . . . \{by using a call-back technique via a telephone network\}
21/316 . . . \{by observing the pattern of computer usage, e.g. typical user behaviour\}
21/32 . . . using biometric data, e.g. fingerprints, iris scans or voiceprints
21/33 . . . using certificates
21/335 . . . \{for accessing specific resources, e.g. using Kerberos tickets\}
21/34 . . . involving the use of external additional devices, e.g. dongles or smart cards
21/35 . . . communicating wirelessly
21/36 . . . by graphic or iconic representation
21/40 . . . by quorum, i.e. whereby two or more security principals are required
21/41 . . . where a single sign-on provides access to a plurality of computers
21/42 . . . using separate channels for security data
21/43 . . . wireless channels
21/44 . . . Program or device authentication
21/445 . . . {by mutual authentication, e.g. between devices or programs}
21/45 . . . Structures or tools for the administration of authentication
21/46 . . . by designing passwords or checking the strength of passwords
21/50 . . . Monitoring users, programs or devices to maintain the integrity of platforms, e.g. of processors, firmware or operating systems
21/51 . . . at application loading time, e.g. accepting, rejecting, starting or inhibiting executable software based on integrity or source reliability
21/52 . . . during program execution, e.g. stack integrity
   { Preventing unwanted data erasure, Buffer overflow}
21/53 . . . by executing in a restricted environment, e.g. sandbox or secure virtual machine
21/54 . . . by adding security routines or objects to programs
21/55 . . . Detecting local intrusion or implementing counter-measures
21/552 . . . {involving long-term monitoring or reporting}
21/554 . . . {involving event detection and direct action}
21/556 . . . {involving covert channels, i.e. data leakage between processes (inhibiting the analysis of circuitry or operation with measures against power attack G06F 21/755)}
21/56 . . . Computer malware detection or handling, e.g. anti-virus arrangements
21/561 . . . {Virus type analysis}
21/562 . . . {Static detection}
21/563 . . . {by source code analysis}
21/564 . . . {by virus signature recognition}
21/565 . . . {by checking file integrity}
21/566 . . . {Dynamic detection, i.e. detection performed at run-time, e.g. emulation, suspicious activities}
21/567 . . . {using dedicated hardware}
21/568 . . . {eliminating virus, restoring damaged files}
21/57 . . . Certifying or maintaining trusted computer platforms, e.g. secure boot or power-downs, version controls, system software checks, secure updates or assessing vulnerabilities

WARNING
   All groups listed in this Warning should be considered in order to perform a complete search.

21/572 . . . {Secure firmware programming, e.g. of basic input output system [BIOS]}
21/575 . . . {Secure boot}
21/577 . . . {Assessing vulnerabilities and evaluating computer system security}
21/60 . . . Protecting data
21/602 . . . {Providing cryptographic facilities or services}
21/604 . . . {Tools and structures for managing or administering access control systems}
21/606 . . . {by securing the transmission between two devices or processes}
21/608 . . . {Secure printing}
21/62 . . . Protecting access to data via a platform, e.g. using keys or access control rules
21/6209 . . . {to a single file or object, e.g. in a secure envelope, encrypted and accessed using a key, or with access control rules appended to the object itself}
21/6218 . . . {to a system of files or objects, e.g. local or distributed file system or database}
21/6227 . . . {where protection concerns the structure of data, e.g. records, types, queries}
21/6236 . . . {between heterogeneous systems}
21/6245 . . . {Protecting personal data, e.g. for financial or medical purposes}
21/6254 . . . {by anonymising data, e.g. decorrelating personal data from the owner’s identification}
21/6263 . . . {during internet communication, e.g. revealing personal data from cookies}
21/6272 . . . {by registering files or documents with a third party}
21/6281 . . . {at program execution time, where the protection is within the operating system}
21/629 . . . {to features or functions of an application}
21/64 . . . Protecting data integrity, e.g. using checksums, certificates or signatures
21/645 . . . {using a third party}
21/70 . . . Protecting specific internal or peripheral components, in which the protection of a component leads to protection of the entire computer
21/71 . . . {to assure secure computing or processing of information}
21/72 . . . {in cryptographic circuits}
21/725 . . . {operating on a secure reference time value}
21/73 . . . {by creating or determining hardware identification, e.g. serial numbers}
21/74 . . . {operating in dual or compartmented mode, i.e. at least one secure mode}
21/75 . . . {by inhibiting the analysis of circuitry or operation}

WARNING
   Group G06F 21/75 is impacted by reclassification into group G06F 21/755.
   Groups G06F 21/75 and G06F 21/755 should be considered in order to perform a complete search.

21/755 . . . {with measures against power attack}

WARNING
   Group G06F 21/755 is incomplete pending reclassification of documents from group G06F 21/75.
   Groups G06F 21/75 and G06F 21/755 should be considered in order to perform a complete search.

21/76 . . . {in application-specific integrated circuits [ASICs] or field-programmable devices, e.g. field-programmable gate arrays [FPGAs] or programmable logic devices [PLDs]}
21/77 . . . {in smart cards}
to assure secure storage of data (address-based protection against unauthorised use of memory G06F 12/14; record carriers for use with machines and with at least a part designed to carry digital markings G06K 19/00) in semiconductor storage media, e.g. directly-addressable memories in storage media based on magnetic or optical technology, e.g. disks with sectors (preventing unauthorised reproduction or copying of disc-type recordable media G11B 20/00) [using a security table for the storage sub-system] by operating on the power supply, e.g. enabling or disabling power-on, sleep or resume operations Protecting input, output or interconnection devices output devices, e.g. displays or monitors interconnection devices, e.g. bus-connected or in-line devices Secure or tamper-resistant housings by means of encapsulation, e.g. for integrated circuits Detecting or preventing theft or loss

Computer-aided design [CAD]

NOTE
In this group, it is desirable to add the indexing codes of groups G06F 2111/00 - G06F 2119/00.

WARNING
Group G06F 30/10 is impacted by reclassification into groups G06F 30/12, G06F 2111/00 - G06F 2119/22.
Groups G06F 30/00, G06F 30/10, G06F 30/12, and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

30/10 Geometric CAD

WARNING
Group G06F 30/10 is incomplete pending reclassification of documents from group G06F 30/00.
Groups G06F 30/00 and G06F 30/10 should be considered in order to perform a complete search.

30/12 characterised by design entry means specially adapted for CAD, e.g. graphical user interfaces [GUI] specially adapted for CAD

WARNING
Group G06F 30/12 is incomplete pending reclassification of documents from groups G06F 30/00, G06F 30/17, and G06F 30/18. All groups listed in this Warning should be considered in order to perform a complete search.

30/13 Architectural design, e.g. computer-aided architectural design [CAAD] related to design of buildings, bridges, landscapes, production plants or roads

30/15 Vehicle, aircraft or watercraft design

30/17 Mechanical parametric or variational design

WARNING
Group G06F 30/17 is impacted by reclassification into groups G06F 30/12 and G06F 2111/00 - G06F 2119/22.
Groups G06F 30/17, G06F 30/12 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

30/18 Network design, e.g. design based on topological or interconnect aspects of utility systems, piping, heating ventilation air conditioning [HVAC] or cabling (circuit design at the physical level G06F 30/39; network planning tools for wireless communication networks H04W 16/18)

WARNING
Group G06F 30/18 is impacted by reclassification into groups G06F 30/12 and G06F 2111/00 - G06F 2119/22.
Groups G06F 30/18, G06F 30/12 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

30/20 Design optimisation, verification or simulation (optimisation, verification or simulation of circuit designs G06F 30/30)

WARNING
Group G06F 30/20 is impacted by reclassification into groups G06F 30/25, G06F 30/27, G06F 30/28 and G06F 2111/00 - G06F 2119/22.
Groups G06F 30/20, G06F 30/25, G06F 30/27, G06F 30/28 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

30/22 using Petri net models

30/23 using finite element methods [FEM] or finite difference methods [FDM]

WARNING
Group G06F 30/23 is impacted by reclassification into groups G06F 30/25, G06F 30/367, G06F 30/398 and G06F 2111/00 - G06F 2119/22.
Groups G06F 30/23, G06F 30/25, G06F 30/367, G06F 30/398 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.
. . using particle-based methods

**WARNING**

Group G06F 30/25 is incomplete pending reclassification of documents from groups G06F 30/20 and G06F 30/23.

Groups G06F 30/20, G06F 30/23, and G06F 30/25 should be considered in order to perform a complete search.

. . using machine learning, e.g. artificial intelligence, neural networks, support vector machines [SVM] or training a model

**WARNING**

Group G06F 30/27 is incomplete pending reclassification of documents from group G06F 30/20.

Groups G06F 30/20 and G06F 30/27 should be considered in order to perform a complete search.

. . using fluid dynamics, e.g. using Navier-Stokes equations or computational fluid dynamics [CFD]

**WARNING**

Group G06F 30/28 is incomplete pending reclassification of documents from group G06F 30/20.

Groups G06F 30/20 and G06F 30/28 should be considered in order to perform a complete search.

. . Circuit design

**WARNING**

Group G06F 30/30 is impacted by reclassification into groups G06F 30/31, G06F 30/32, G06F 30/33, G06F 30/333, G06F 30/34, G06F 30/343, G06F 30/347, G06F 30/38 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/30, G06F 30/31, G06F 30/32, G06F 30/33, G06F 30/333, G06F 30/34, G06F 30/343, G06F 30/347, G06F 30/38 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

. . Design entry, e.g. editors specifically adapted for circuit design

**WARNING**

Group G06F 30/31 is incomplete pending reclassification of documents from groups G06F 30/30, G06F 30/34, and G06F 30/36.

All groups listed in this Warning should be considered in order to perform a complete search.

. . Circuit design at the digital level (reconfigurable circuits G06F 30/34)

**WARNING**

Group G06F 30/32 is incomplete pending reclassification of documents from group G06F 30/30.

Groups G06F 30/30 and G06F 30/32 should be considered in order to perform a complete search.

. . Translation or migration, e.g. logic to logic, hardware description language [HDL] translation or netlist translation

**WARNING**

Group G06F 30/32 is incomplete pending reclassification of documents from groups G06F 30/30 and G06F 30/327.

Groups G06F 30/30, G06F 30/327, and G06F 30/32 should be considered in order to perform a complete search.

. . Logic synthesis; Behaviour synthesis, e.g. mapping logic, HDL to netlist, high-level language to RTL or netlist

**WARNING**

Group G06F 30/327 is impacted by reclassification into groups G06F 30/323 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/327, G06F 30/323 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

. . Design verification, e.g. functional simulation or model checking

**WARNING**

Group G06F 30/33 is impacted by reclassification into groups G06F 30/3308, G06F 30/3315 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/33, G06F 30/3308, G06F 30/3315 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

. . using simulation

**WARNING**

Group G06F 30/3308 is incomplete pending reclassification of documents from group G06F 30/33.

Groups G06F 30/33 and G06F 30/3308 should be considered in order to perform a complete search.

. . with hardware acceleration, e.g. by using field programmable gate array [FPGA] or emulation
Timing analysis

WARNING

Group G06F 30/3312 is impacted by reclassification into groups G06F 30/3315 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/3312, G06F 30/3315 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

30/3315 . . . using static timing analysis [STA]

WARNING

Group G06F 30/3315 is incomplete pending reclassification of documents from groups G06F 30/33 and G06F 30/3312.

Groups G06F 30/33, G06F 30/3312 and G06F 30/3315 should be considered in order to perform a complete search.

30/3323 . . . using formal methods, e.g. equivalence checking or property checking

30/333 . . . Design for testability [DFT], e.g. scan chain or built-in self-test [BIST]

WARNING

Group G06F 30/333 is incomplete pending reclassification of documents from group G06F 30/30.

Groups G06F 30/30 and G06F 30/333 should be considered in order to perform a complete search.

30/337 . . . Design optimisation

WARNING

Group G06F 30/337 is incomplete pending reclassification of documents from group G06F 30/30.

Groups G06F 30/30 and G06F 30/337 should be considered in order to perform a complete search.

30/34 . . . for reconfigurable circuits, e.g. field programmable gate arrays [FPGA] or programmable logic devices [PLD]

WARNING

Group G06F 30/34 is incomplete pending reclassification of documents from group G06F 30/30.

Group G06F 30/34 is impacted by reclassification into groups G06F 30/31, G06F 30/343, G06F 30/347 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/34, G06F 30/31, G06F 30/343, G06F 30/347 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

30/343 . . . Logical level

WARNING

Group G06F 30/343 is incomplete pending reclassification of documents from groups G06F 30/30 and G06F 30/34.

Groups G06F 30/30, G06F 30/34, and G06F 30/343 should be considered in order to perform a complete search.

30/347 . . . Physical level, e.g. placement or routing

WARNING

Group G06F 30/347 is incomplete pending reclassification of documents from groups G06F 30/30, G06F 30/34, and G06F 30/39.

Groups G06F 30/347, G06F 30/30, G06F 30/34 and G06F 30/39 should be considered in order to perform a complete search.

30/35 . . Delay-insensitive circuit design, e.g. asynchronous or self-timed

30/36 . . Circuit design at the analogue level

WARNING

Group G06F 30/36 is impacted by reclassification into groups G06F 30/31, G06F 30/373, G06F 30/38 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/36, G06F 30/31, G06F 30/373, G06F 30/38 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

30/367 . . Design verification, e.g. using simulation, simulation program with integrated circuit emphasis [SPICE], direct methods or relaxation methods

WARNING

Group G06F 30/367 is incomplete pending reclassification of documents from group G06F 30/23.

Groups G06F 30/23 and G06F 30/367 should be considered in order to perform a complete search.

30/373 . . Design optimisation

WARNING

Group G06F 30/373 is incomplete pending reclassification of documents from group G06F 30/30.

Groups G06F 30/30 and G06F 30/373 should be considered in order to perform a complete search.
Circuit design at the mixed level of analogue and digital signals

**WARNING**

Group G06F 30/38 is incomplete pending reclassification of documents from groups G06F 30/30 and G06F 30/36.

Groups G06F 30/30, G06F 30/36, and G06F 30/38 should be considered in order to perform a complete search.

Circuit design at the physical level (physical level design for reconfigurable circuits G06F 30/347)

**WARNING**

Group G06F 30/39 is impacted by reclassification into groups G06F 30/347, G06F 30/396, G06F 30/398 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/39, G06F 30/347, G06F 30/396, G06F 30/398 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

Floor-planning or layout, e.g. partitioning or placement

**WARNING**

Group G06F 30/392 is impacted by reclassification into groups G06F 30/396 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/392, G06F 30/396 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

Routing (G06F 30/396 takes precedence)

**WARNING**

Group G06F 30/394 is impacted by reclassification into groups G06F 30/3947, G06F 30/3953, G06F 30/396 and G06F 2111/00 - G06F 2119/22.

Groups G06F 30/394, G06F 30/3947, G06F 30/3953, G06F 30/396 and G06F 2111/00 - G06F 2119/22 should be considered in order to perform a complete search.

**WARNING**

Group G06F 30/3947 is incomplete pending reclassification of documents from group G06F 30/394.

Groups G06F 30/394 and G06F 30/3947 should be considered in order to perform a complete search.

Design verification or optimisation, e.g. using design rule check [DRC], layout versus schematics [LVS] or finite element methods [FEM] (optical proximity correction [OPC] design processes G03F 1/36)

**WARNING**

Group G06F 30/398 is incomplete pending reclassification of documents from groups G06F 30/23 and G06F 30/39.

Groups G06F 30/23, G06F 30/39 and G06F 30/398 should be considered in order to perform a complete search.

Handling natural language data (speech analysis or synthesis, speech recognition G10L)

Text processing (natural language analysis G06F 40/20; semantic analysis G06F 40/30; processing or translation of natural language G06F 40/40)

Formatting, i.e. changing of presentation of documents (automatic justification G06F 40/189; automatic line break hyphenation G06F 40/191)

Display of layout of documents; Previewing

Font handling; Temporal or kinetic typography

Mathematical or scientific formatting; Subscripts; Superscripts

Pagination

Tagging; Marking up (details of markup languages G06F 40/143); Designating a block; Setting of attributes (style sheets, e.g. eXtensible Stylesheet Language Transformation [XSLT], G06F 40/154)

Use of codes for handling textual entities

Storage facilities

Character encoding

Handling non-Latin characters, e.g. kana-to-kanji conversion

Fragmentation of text files, e.g. creating reusable text-blocks; Linking to fragments, e.g. using XInclude; Namespaces

Hyperlinking

Hierarchical processing, e.g. outlines
should be considered in order to perform a complete search.

40/232 . . . Orthographic correction, e.g. spell checking or vowelisation
40/237 . . . Lexical tools

**WARNING**

Group G06F 40/237 is incomplete pending reclassification of documents from group G06F 40/20.

Groups G06F 40/20 and G06F 40/237 should be considered in order to perform a complete search.

40/242 . . . Dictionaries
40/247 . . . Thesauruses; Synonyms
40/253 . . . Grammatical analysis; Style critique
40/258 . . . Heading extraction; Automatic titling; Numbering
40/263 . . . Language identification
40/268 . . . Morphological analysis
40/274 . . . Converting codes to words; Guess-ahead of partial word inputs
40/279 . . . Recognition of textual entities
40/284 . . . Lexical analysis, e.g. tokenisation or collocates
40/289 . . . Phrasal analysis, e.g. finite state techniques or chunking
40/295 . . . Named entity recognition
40/30 . . . Semantic analysis
40/35 . . . Discourse or dialogue representation
40/40 . . . Processing or translation of natural language (natural language analysis G06F 40/20; semantic analysis G06F 40/30)
40/42 . . . Data-driven translation
40/44 . . . Statistical methods, e.g. probability models
40/45 . . . Example-based machine translation; Alignment
40/47 . . . Machine-assisted translation, e.g. using translation memory
40/49 . . . using very large corpora, e.g. the web
40/51 . . . Translation evaluation
40/53 . . . Processing of non-Latin text (kana-to-kanji conversion G06F 40/129; vowelisation G06F 40/232)
40/55 . . . Rule-based translation
40/56 . . . Natural language generation
40/58 . . . Use of machine translation, e.g. for multi-lingual retrieval, for server-side translation for client devices or for real-time translation

**2101/00** Indexing scheme relating to the type of digital function generated

| 2101/02 | Linear multivariable functions, i.e. sum of products |
| 2101/04 | Trigonometric functions |
| 2101/06 | Co-ordinate transformations |
| 2101/08 | Powers or roots |
| 2101/10 | Logarithmic or exponential functions |
| 2101/12 | Reciprocal functions |
| 2101/14 | Probability distribution functions |
| 2101/16 | PCM compounding functions |
Indexing scheme associated with group G06F 30/00, relating to CAD techniques

2111/00 Details relating to CAD techniques

**WARNING**

Groups G06F 2111/00 - G06F 2111/20 are incomplete pending reclassification of documents from groups G06F 30/00, G06F 30/17, G06F 30/18, G06F 30/20, G06F 30/23, G06F 30/30, G06F 30/327, G06F 30/33, G06F 30/3312, G06F 30/34, G06F 30/36, G06F 30/39, G06F 30/392, and G06F 30/394.

All groups listed in this Warning should be considered in order to perform a complete search.

2111/02 . CAD in a network environment, e.g. collaborative CAD or distributed simulation
2111/04 . Constraint-based CAD
2111/06 . Multi-objective optimisation, e.g. Pareto optimisation using simulated annealing [SA], ant colony algorithms or genetic algorithms [GA]
2111/08 . Probabilistic or stochastic CAD
2111/10 . Numerical modelling
2111/12 . Symbolic schematics
2111/14 . related to nanotechnology
2111/16 . Customisation or personalisation
2111/18 . using virtual or augmented reality
2111/20 . Configuration CAD, e.g. designing by assembling or positioning modules selected from libraries of predesigned modules

Indexing scheme associated with group G06F 30/00, relating to the application field

2113/00 Details relating to the application field

**WARNING**

Groups G06F 2113/00 - G06F 2113/28 are incomplete pending reclassification of documents from groups G06F 30/00, G06F 30/17, G06F 30/18, G06F 30/20, G06F 30/23, G06F 30/30, G06F 30/327, G06F 30/33, G06F 30/3312, G06F 30/34, G06F 30/36, G06F 30/39, G06F 30/392, and G06F 30/394.

All groups listed in this Warning should be considered in order to perform a complete search.

2113/02 . Data centres
2113/04 . Power grid distribution networks
2113/06 . Wind turbines or wind farms
2113/08 . Fluids
2113/10 . Additive manufacturing, e.g. 3D printing
2113/12 . Cloth
2113/14 . Pipes
2113/16 . Cables, cable trees or wire harnesses
2113/18 . Chip packaging
2113/20 . Packaging, e.g. boxes or containers
2113/22 . Moulding
2113/24 . Sheet material
2113/26 . Composites
2113/28 . Fuselage, exterior or interior

Indexing scheme associated with group G06F 30/00, relating to the type of circuit

2115/00 Details relating to the type of the circuit

**WARNING**

Groups G06F 2115/00 - G06F 2115/12 are incomplete pending reclassification of documents from groups G06F 30/00, G06F 30/17, G06F 30/18, G06F 30/20, G06F 30/23, G06F 30/30, G06F 30/327, G06F 30/33, G06F 30/3312, G06F 30/34, G06F 30/36, G06F 30/39, G06F 30/392, and G06F 30/394.

All groups listed in this Warning should be considered in order to perform a complete search.

2115/02 . System on chip [SoC] design
2115/04 . Micro electro-mechanical systems [MEMS]
2115/06 . Structured ASICs
2115/08 . Intellectual property [IP] blocks or IP cores
2115/10 . Processors
2115/12 . Printed circuit boards [PCB] or multi-chip modules [MCM]

Indexing scheme associated with group G06F 30/00, relating to the type or aim of the circuit design

2117/00 Details relating to the type or aim of the circuit design

**WARNING**

Groups G06F 2117/00 - G06F 2117/12 are incomplete pending reclassification of documents from groups G06F 30/00, G06F 30/17, G06F 30/18, G06F 30/20, G06F 30/23, G06F 30/30, G06F 30/327, G06F 30/33, G06F 30/3312, G06F 30/34, G06F 30/36, G06F 30/39, G06F 30/392, and G06F 30/394.

All groups listed in this Warning should be considered in order to perform a complete search.

2117/02 . Fault tolerance, e.g. for transient fault suppression
2117/04 . Clock gating

**WARNING**

Group G06F 2117/04 is incomplete pending reclassification of documents from groups G06F 30/00, G06F 30/17, G06F 30/18, G06F 30/20, G06F 30/23, G06F 30/30, G06F 30/327, G06F 30/33, G06F 30/3312, G06F 30/34, G06F 30/36, G06F 30/39, G06F 30/392, G06F 30/394, and G06F 30/396.

All groups listed in this Warning should be considered in order to perform a complete search.

2117/06 . Spare resources, e.g. for permanent fault suppression
2117/08 . HW-SW co-design, e.g. HW-SW partitioning
2117/10 . Buffer insertion
2117/12 . Sizing, e.g. of transistors or gates
Indexing scheme associated with group **G06F 30/00**, relating to the purpose – mostly applicable to circuits – but also...  

**2200/00** Details relating to the type or aim of the analysis or the optimisation

**WARN**

Groups **G06F 2119/00 - G06F 2119/22** are incomplete pending reclassification of documents from groups **G06F 30/00, G06F 30/17, G06F 30/18, G06F 30/20, G06F 30/23, G06F 30/30, G06F 30/327, G06F 30/33, G06F 30/3312, G06F 30/34, G06F 30/36, G06F 30/39, G06F 30/392**, and **G06F 30/394**. All groups listed in this Warning should be considered in order to perform a complete search.

**2199/00** Reliability analysis or reliability optimisation; Failure analysis, e.g. worst case scenario performance, failure mode and effects analysis [FMEA]

**2199/04** Ageing analysis or optimisation against ageing

**2199/06** Power analysis or power optimisation

**2199/08** Thermal analysis or thermal optimisation

**2199/10** Noise analysis or noise optimisation

**2199/12** Timing analysis or timing optimisation

**2199/14** Force analysis or force optimisation, e.g. static or dynamic forces

**2199/16** Equivalence checking

**2199/18** Manufacturability analysis or optimisation for manufacturability

**2199/20** Design reuse, reusability analysis or reusability optimisation

**2199/22** Yield analysis or yield optimisation

**2200/00** Indexing scheme relating to **G06F 1/04 - G06F 1/32**

**2200/16** Indexing scheme relating to **G06F 1/16 - G06F 1/18**

**2200/161** Indexing scheme relating to constructional details of the monitor

**2200/1611** CRT monitor

**2200/1612** Flat panel monitor

**2200/1613** Supporting arrangements, e.g. for filters or documents associated to a laptop display

**2200/1614** Image rotation following screen orientation, e.g. switching from landscape to portrait mode

**2200/163** Indexing scheme relating to constructional details of the computer

**2200/1631** Panel PC, e.g. single housing hosting PC and display panel

**2200/1632** Pen holder integrated in the computer

**2200/1633** Protecting arrangement for the entire housing of the computer

**2200/1634** Integrated protective display lid, e.g. for touch-sensitive display in handheld computer

**2200/1635** Stackable modules

**2200/1636** Sensing arrangement for detection of a tap gesture on the housing

**2200/1637** Sensing arrangement for detection of housing movement or orientation, e.g. for controlling scrolling or cursor movement on the display of an handheld computer

**2200/1638** Computer housing designed to operate in both desktop and tower orientation

**2200/1639** Arrangements for locking plugged peripheral connectors

**2200/20** Indexing scheme relating to **G06F 1/20**

**2200/201** Cooling arrangements using cooling fluid

**2200/202** Air convective hinge

**2200/203** Heat conductive hinge

**2200/26** Indexing scheme relating to **G06F 1/26**

**2200/261** PC controlled powerstrip

**2201/00** Indexing scheme relating to error detection, to error correction, and to monitoring

**2201/80** Database-specific techniques

**2201/805** Real-time

**2201/81** Threshold

**2201/815** Virtual (middleware or OS functionality using virtual machines to implement generic software techniques for error detection or fault masking **G06F 11/1484**)

**2201/82** Solving problems relating to consistency (ensuring consistency in mirrored systems **G06F 11/2064**)

**2201/825** the problem or solution involving locking

**2201/83** the solution involving signatures

**2201/835** Timestamp

**2201/84** Using snapshots, i.e. a logical point-in-time copy of the data

**2201/845** Systems in which the redundancy can be transformed in increased performance

**2201/85** Active fault masking without idle spares (active fault masking without idle spare hardware where processing functionality is redundant **G06F 11/2035**)

**2201/855** Details of asynchronous mirroring using a journal to transfer not-yet-mirrored changes

**2201/86** Event-based monitoring

**2201/865** Monitoring of software

**2201/87** Monitoring of transactions

**2201/875** Monitoring of systems including the internet

**2201/88** Monitoring involving counting

**2201/885** Monitoring specific for caches

**2203/00** Indexing scheme relating to **G06F 3/00 - G06F 3/048**

**2203/01** Indexing scheme relating to **G06F 3/01**

**2203/011** Emotion or mood input determined on the basis of sensed human body parameters such as pulse, heart rate or beat, temperature of skin, facial expressions, iris, voice pitch, brain activity patterns

**2203/012** Walk-in-place systems for allowing a user to walk in a virtual environment while constraining him to a given position in the physical environment

**2203/013** Force feedback applied to a game

**2203/014** Force feedback applied to GUI

**2203/015** Force feedback applied to a joystick

**2203/033** Indexing scheme relating to **G06F 3/033**

**2203/0331** Finger worn pointing device

**2203/0332** Ergonomic shaped mouse adjustable to suit one of both hands

**2203/0333** Ergonomic shaped mouse for one hand
Indexing scheme relating to G06F 3/038

Multimodal input, i.e. interface arrangements enabling the user to issue commands by simultaneous use of input devices of different nature, e.g. voice plus gesture on digitizer

Indexing scheme relating to G06F 3/041 - G06F 3/045

WARNING

Group G06F 2203/041 is impacted by reclassification into group G06F 2203/04114.

Groups G06F 2203/041 and G06F 2203/04114 should be considered in order to perform a complete search.

Indexing scheme relating to G06F 3/048

Cursor retrieval aid, i.e. visual aspect modification, blinking, colour changes, enlargement or other visual cues, for helping user do find the cursor in graphical user interfaces

Indexing scheme relating to G06F 3/049

Touch less 2D-digitiser, i.e. digitiser detecting the X/Y position of the input means, finger or stylus, also when it does not touch, but is proximate to the digitiser's interaction surface without distance measurement in the Z direction

FTIR in optical digitiser, i.e. touch detection by frustrating the total internal reflection within an optical waveguide due to changes of optical properties or deformation at the touch location

Cross over in capacitive digitiser, i.e. details of structures for connecting electrodes of the sensing pattern where the connections cross each other, e.g. bridge structures comprising an insulting layer, or vias through substrate

Electrode mesh in capacitive digitiser: electrode for touch sensing is formed of a mesh of very fine, normally metallic, interconnected lines that are almost invisible to see. This provides a quite large but transparent electrode surface, without need for ITO or similar transparent conductive material

Peripheral electrode pattern in resistive digitisers, i.e. electrodes at the periphery of the resistive sheet are shaped in patterns enhancing linearity of induced field

Touch screens adapted for alternating or simultaneous interaction with active pens and passive pointing devices like fingers or passive pens

WARNING

Group G06F 2203/04114 is incomplete pending reclassification of documents from group G06F 2203/041.

Groups G06F 2203/041 and G06F 2203/04114 should be considered in order to perform a complete search.

Flexible digitiser, i.e. constructional details for allowing the whole digitising part of a device to be flexed or rolled like a sheet of paper

Manufacturing, i.e. details related to manufacturing processes specially suited for touch sensitive devices

Multi-touch detection in digitiser, i.e. details about the simultaneous detection of a plurality of touching locations, e.g. multiple fingers or pen and finger

Pressure sensors for measuring the pressure or force exerted on the touch surface without providing the touch position

Multi-sensing digitiser, i.e. digitiser using at least two different sensing technologies simultaneously or alternatively, e.g. for detecting pen and finger, for saving power or for improving position detection
Indexing scheme relating to computer software, indexing scheme related to group G06F 5/00; Methods or arrangements for data conversion without changing the order or content of the data handled

Indexing scheme relating to groups

G06F 5/06 - G06F 5/16

Adapt frequency, i.e. clock frequency at one side is adapted to clock frequency, or average clock frequency, at the other side; Not pulse stuffing only

Allowing rewriting or rereading data to or from the buffer

Dynamically variable buffer size

Linked list, i.e. structure using pointers, e.g. allowing non-contiguous address segments in one logical buffer or dynamic buffer space allocation

With bypass possibility

User-programmable number or size of buffers, i.e. number of separate buffers or their size can be allocated freely

Bidirectional FIFO, i.e. system allowing data transfer in two directions

Indexing scheme relating to groups

G06F 5/10 - G06F 5/14

Avoiding metastability, i.e. preventing hazards, e.g. by using Gray code counters

Delay lines

Details of pointers, i.e. structure of the address generators

Reading or writing the data blockwise, e.g. using an extra end-of-block pointer

Indexing scheme relating to groups

G06F 5/12 - G06F 5/14

Contention resolution, i.e. resolving conflicts between simultaneous read and write operations

Monitoring of intermediate fill level, i.e. with additional means for monitoring the fill level, e.g. half full flag, almost empty flag

Indexing scheme related to dedicated interfaces for computers

Indexing scheme related to storage interfaces for computers, indexing schema related to group G06F 3/06

Defragmentation

Graphical user interface [GUI]

Load balancing

One time programmable [OTP] memory, e.g. PROM, WORM

Indexing scheme related to printer interfaces for computers, indexing schema related to group G06F 3/12

Cost estimation

Degraded mode, e.g. in view of consumables depleted, thresholds reached

Load balancing

Pre-printed media, e.g. media stock, forms, logos

Print-to a presentation device other than a printer, e.g. e-reader, e-paper, tablet

Sub-job

Indexing scheme related to audio interfaces for computers, indexing schema related to group G06F 3/16

Indexing scheme relating to methods or arrangements for processing data by operating upon the order or content of the data handled

Indexing scheme relating to groups

G06F 7/02 - G06F 7/026

String search, i.e. pattern matching, e.g. find identical word or best match in a string

Indexing scheme relating to groups

G06F 7/22 - G06F 7/36

Binary data tree

External sorting

Priority queue, i.e. 1 word in, 1 word out sorter; Output word, i.e. min or max of words in memory

Sorting or merging network

Indexing scheme relating to groups

G06F 7/38 - G06F 7/575

Details

concerning the type of numbers or the way they are handled

Devices capable of handling different types of numbers

Accepting numbers of variable word length

Reconfigurable for different fixed word lengths (multigauge devices G06F 2207/3828)

Accepting both fixed-point and floating-point numbers

Multigauge devices, i.e. capable of handling packed numbers without unpacking them

Less usual number representations

One's complement

Octal

Hexadecimal

Unit distance code

Calculation with most significant digit first

Operand swapping

Special constructional features

Clockless, i.e. asynchronous operation used as a design principle (G06F 2207/3888 takes precedence)

Bypass control, i.e. possibility to transfer an operand unchanged to the output

Precharge of output to prevent leakage

Alternation of true and inverted stages

Skewing

Pipelining

Wave pipelining, i.e. processing multiple subsequent operand sets asynchronously within each pipeline stage

Systolic array

Bit slicing

Indexing scheme relating to groups

G06F 7/48 - G06F 7/575

Special implementations

Associative memory or processor

Cascade or current mode logic

Charge transfer devices

Counters performing arithmetic operations

Multiplexers
2207/4814 . . . Non-logic devices, e.g. operational amplifiers
2207/4816 . . . Pass transistors
2207/4818 . . . Threshold devices
2207/482 . . . using capacitive adding networks
2207/4822 . . . Majority gates
2207/4824 . . . Neural networks
2207/4826 . . . using transistors having multiple electrodes of the same type, e.g. multi-emitter devices, neuron-MOS devices
2207/4828 . . . Negative resistance devices, e.g. tunnel diodes, gunn effect devices
2207/483 . . . Indexing scheme relating to group G06F 7/483
2207/4835 . . . Computations with rational numbers
2207/491 . . . Indexing scheme relating to groups G06F 7/491 - G06F 7/4917
2207/49105 . . . Determining 9's or 10's complement
2207/49111 . . . Decimal floating-point representation
2207/49115 . . . Duodecimal numbers
2207/4912 . . . Non-specified BCD representation
2207/49125 . . . Non-specified decimal representation
2207/4913 . . . Sterling system, i.e. mixed radix with digit weights of 10-20-12
2207/49135 . . . Using 036012 or 3612 code, i.e. binary coded decimal representation with digit weight of (0,1) 3, 6, 0, 1 and 2 respectively
2207/4914 . . . Using 2-out-of-5 code, i.e. binary coded decimal representation with digit weight of 2, 4, 2 and 1 respectively
2207/49145 . . . Using 2421 code, i.e. non-weighted representation in which 2 out of 5 bits are "1" for each decimal digit
2207/4915 . . . Using 4221 code, i.e. binary coded decimal representation with digit weight of 4, 2, 2 and 1 respectively
2207/49155 . . . Using 51111 code, i.e. binary coded decimal representation with digit weight of 5, 1, 1, 1 and 1 respectively
2207/4916 . . . Using 5211 code, i.e. binary coded decimal representation with digit weight of 5, 2, 1 and 1 respectively
2207/49165 . . . Using 5311 code, i.e. binary coded decimal representation with digit weight of 5, 3, 1 and 1 respectively
2207/4917 . . . Using 5321 or 543210 code, i.e. binary coded decimal representation with digit weight of 5, 3, 2, 1 and 0 respectively
2207/49175 . . . Using 54321 code, i.e. binary coded decimal representation with digit weight of 5, 4, 3, 2 and 1 respectively
2207/4918 . . . Using Aiken code, i.e. using both first and last 5 of 16 possible 4-bit values, rendering the code symmetrical within the series of 16 values
2207/49185 . . . Using biquinary code, i.e. combination of 5-valued and 2-valued digits, having values 0, 1, 2, 3, 4 and 0, 5 or 0, 2, 4, 6, 7 and 0, 1 respectively
2207/4919 . . . Using excess-3 code, i.e. natural BCD + offset of 3, rendering the code symmetrical within the series of 16 possible 4 bit values
2207/49195 . . . Using pure decimal representation, e.g. 10-valued voltage signal, 1-out-of-10 code
2207/492 . . . Indexing scheme relating to groups G06F 7/492 - G06F 7/496
2207/4921 . . . Single digit adding or subtracting
2207/4922 . . . Multi-operand adding or subtracting
2207/4923 . . . Incrementer or decrementer
2207/4924 . . . Digit-parallel adding or subtracting
2207/506 . . . Indexing scheme relating to groups G06F 7/506 - G06F 7/508
2207/5063 . . . 2-input gates, i.e. only using 2-input logical gates, e.g. binary carry look-ahead, e.g. Kogge-Stone or Ladner-Fischer adder
2207/535 . . . Indexing scheme relating to groups G06F 7/535 - G06F 7/5375
2207/5351 . . . Multiplicative non-restoring division, e.g. SRT, using multiplication in quotient selection
2207/5352 . . . Non-restoring division not covered by G06F 7/5375
2207/5353 . . . Restoring division
2207/5354 . . . Using table lookup, e.g. for digit selection in division by digit recurrence
2207/5355 . . . Using iterative approximation not using digit recurrence, e.g. Newton Raphson or Goldschmidt
2207/5356 . . . Via reciprocal, i.e. calculate reciprocal only, or calculate reciprocal first and then the quotient from the reciprocal and the numerator
2207/544 . . . Indexing scheme relating to group G06F 7/544
2207/5442 . . . Absolute difference
2207/552 . . . Indexing scheme relating to groups G06F 7/552 - G06F 7/5525
2207/5521 . . . Inverse root of a number or a function, e.g. the reciprocal of a Pythagorean sum
2207/5523 . . . Calculates a power, e.g. the square, of a number or a function, e.g. polynomials
2207/5525 . . . Pythagorean sum, i.e. the square root of a sum of squares
2207/5526 . . . Roots or inverse roots of single operands
2207/5528 . . . Non-restoring calculation, where each result digit is either negative, zero or positive, e.g. SRT
2207/556 . . . Indexing scheme relating to group G06F 7/556
2207/5561 . . . Exponentiation by multiplication, i.e. calculating Y**INT(X) by multiplying Y with itself or a power of itself, INT(X) being the integer part of X
2207/58 . . . Indexing scheme relating to groups G06F 7/58 - G06F 7/588
2207/581 . . . Generating an LFSR sequence, e.g. an m-sequence; sequence may be generated without LFSR, e.g. using Galois Field arithmetic
2207/582 . . . Parallel finite field implementation, i.e. at least partially parallel implementation of finite field arithmetic, generating several new bits or trits per step, e.g. using a GF multiplier
2207/583 . . . Serial finite field implementation, i.e. serial implementation of finite field arithmetic, generating one new bit or trit per step, e.g. using an LFSR or several independent LFSRs; also includes PRNGs with parallel operation between LFSR and outputs
2207/72 . . . Indexing scheme relating to groups G06F 7/72 - G06F 7/729
2207/7204 . . . Prime number generation or prime number testing
2207/7209 . . . Calculation via subfield, i.e. the subfield being GF(q) with q a prime power, e.g. GF ((2**m)**n) via GF(2**m)
2207/7214  Calculation via prime subfield, i.e. the subfield being GF(p) with p an integer prime > 3; e.g. GF(p**k) via GF(p)
2207/7219  Countermeasures against side channel or fault attacks
2207/7223  Random curve mapping, e.g. mapping to an isomorphous or projective curve
2207/7233  Mailing, e.g. (A**e+e) mod n
2207/7238  Operand masking, i.e. message blinding, e.g. (A+e)**e mod n; k.(P+R)
2207/7242  Exponent masking, i.e. key masking, e.g. A**e(+-t) mod n; (k+R),P
2207/7247  Modulo masking, e.g. A**e mod (n*r)
2207/7252  of operation order, e.g. starting to treat the exponent at a random place, or in a randomly chosen direction
2207/7257  Random modification not requiring correction
2207/7261  Uniform execution, e.g. avoiding jumps, or using formulae with the same power profile
2207/7266  Hardware adaptation, e.g. dual rail logic; calculate add and double simultaneously
2207/7271  Fault verification, e.g. comparing two values which should be the same, unless a computational fault occurred
2207/7276  Additional details of aspects covered by group G06F 7/723
2207/728  using repeated square-and-multiply, i.e. right-to-left binary exponentiation
2207/7285  using the window method, i.e. left-to-right k-ary exponentiation
2207/729  Sliding-window exponentiation
2207/7295  using an addition chain, or an addition-subtraction chain

2209/00  Indexing scheme relating to G06F 9/00
2209/46  Indexing scheme relating to G06F 9/46
2209/461  Bridge
2209/462  Lookup
2209/463  Naming
2209/48  Indexing scheme relating to G06F 9/48
2209/481  Exception handling
2209/482  Application
2209/483  Multiproc
2209/484  Precedence
2209/485  Resource constraint
2209/486  Scheduler internals
2209/50  Indexing scheme relating to G06F 9/50
2209/501  Performance criteria
2209/5011  Pool
2209/5012  Processor sets
2209/5013  Request control
2209/5014  Reservation
2209/5015  Service provider selection
2209/5016  Session
2209/5017  Task decomposition
2209/5018  Thread allocation
2209/5019  Workload prediction
2209/502  Proximity
2209/5021  Priority
2209/5022  Workload threshold
2209/503  Resource availability
2209/504  Resource capping
2209/505  Clust
2209/505  Constraint
2209/507  Low-level
2209/508  Monitor
2209/509  Offload
2209/52  Indexing scheme relating to G06F 9/52
2209/521  Atomic
2209/522  Manager
2209/523  Mode
2209/54  Indexing scheme relating to G06F 9/54
2209/541  Client-server
2209/542  Intercept
2209/543  Local
2209/544  Remote
2209/545  Gui
2209/546  Xcast
2209/547  Messaging middleware
2209/548  Queue
2209/549  Remote execution
2211/00  Indexing scheme relating to details of data-processing equipment not covered by groups G06F 3/00 - G06F 13/00
2211/001  In-Line Device
2211/002  Bus
2211/003  Mutual Authentication Bi-Directional Authentication, Dialogue, Handshake
2211/004  Notarisation, Time-Stamp, Date-Stamp
2211/005  Network, LAN, Remote Access, Distributed System
2211/006  E-Mail
2211/007  Encryption, En-/decode, En-/decipher, En-/decypher, Scramble, (De-)compress
2211/008  Public Key, Asymmetric Key, Asymmetric Encryption
2211/009  Trust
2211/10  Indexing scheme relating to G06F 11/10
2211/1002  Indexing scheme relating to G06F 11/1076
2211/1004  Adaptive RAID, i.e. RAID system adapts to changing circumstances, e.g. RAID1 becomes RAID5 as disks fill up
2211/1007  Addressing errors, i.e. silent errors in RAID, e.g. sector slipping and addressing errors
2211/1009  Cache, i.e. caches used in RAID system with parity
2211/1011  Clustered RAID, i.e. clustered or de-clustered RAID where data and parity are spread over more disks than blocks in a parity group
2211/1014  Compression, i.e. RAID systems with parity using compression techniques
2211/1016  Continuous RAID, i.e. RAID system that allows streaming or continuous media, e.g. VOD
2211/1019  Fast writes, i.e. signaling the host that a write is done before data is written to disk
2211/1021  Different size blocks, i.e. mapping of blocks of different size in RAID systems with parity
2211/1023  Different size disks, i.e. non uniform size of disks in RAID systems with parity
2211/1026  Different size groups, i.e. non uniform size of groups in RAID systems with parity
2211/1028 . . . Distributed, i.e. distributed RAID systems with parity
2211/103 . . . Hybrid, i.e. RAID systems with parity comprising a mix of RAID types
2211/1033 . . . Inactive data in parity groups, i.e. RAID parity groups where parity is calculated on only occupied or busy bits in the stripe
2211/1035 . . . Keeping track, i.e. keeping track of data and parity changes
2211/1038 . . . LFS, i.e. Log Structured File System used in RAID systems with parity
2211/104 . . . Metadata, i.e. metadata associated with RAID systems with parity
2211/1042 . . . NanoRAID, i.e. RAID systems using nanotechnology
2211/1045 . . . Nested RAID, i.e. implementing a RAID scheme in another RAID scheme
2211/1047 . . . No striping, i.e. parity calculation on a RAID involving no stripes, where a stripe is an independent set of data
2211/105 . . . On the fly coding, e.g. using XOR accumulators
2211/1052 . . . RAID padding, i.e. completing a redundancy group with dummy data
2211/1054 . . . Parity-fast hardware, i.e. dedicated fast hardware for RAID systems with parity
2211/1057 . . . Parity-multiple bits-RAID6, i.e. RAID 6 implementations
2211/1059 . . . Parity-single bit-RAID5, i.e. RAID 5 implementations
2211/1061 . . . Parity-single bit-RAID4, i.e. RAID 4 implementations
2211/1064 . . . Parity-single bit-RAID3, i.e. RAID 3 implementations
2211/1066 . . . Parity-small-writes, i.e. improved small or partial write techniques in RAID systems
2211/1069 . . . Phantom write, i.e. write were nothing is actually written on the disk of a RAID system
2211/1071 . . . Power loss, i.e. interrupted writes due to power loss in a RAID system
2211/1073 . . . Problems due to wear-out failures in RAID systems
2211/1076 . . . RAID, i.e. RAID on platters
2211/1078 . . . RAIR, i.e. RAID on removable media
2211/108 . . . RAIT, i.e. RAID on tape drive
2211/1083 . . . Reserve area on a disk of a RAID system
2211/1085 . . . RMW, i.e. Read-Modify-Write method for RAID systems
2211/1088 . . . Scrubbing in RAID systems with parity
2211/109 . . . Sector level checksum or ECC, i.e. sector or stripe level checksum or ECC in addition to the RAID parity calculation
2211/1092 . . . Single disk raid, i.e. RAID with parity on a single disk
2211/1095 . . . Writes number reduction, i.e. reducing the number of writes in a RAID array with parity
2211/1097 . . . Boot, Start, Initialise, Power
2211/902 . . . Spectral purity improvement for digital function generators by adding a dither signal, e.g. noise
2212/00 Indexing scheme relating to accessing, addressing or allocation within memory systems or architectures
2212/10 . . . Providing a specific technical effect
2212/1004 . . . Compatibility, e.g. with legacy hardware
2212/1008 . . . Correctness of operation, e.g. memory ordering
2212/1012 . . . Design facilitation
2212/1016 . . . Performance improvement
2212/1021 . . . Hit rate improvement
2212/1024 . . . Latency reduction
2212/1028 . . . Power efficiency
2212/1032 . . . Reliability improvement, data loss prevention, degraded operation etc
2212/1036 . . . Life time enhancement
2212/1041 . . . Resource optimization
2212/1044 . . . Space efficiency improvement
2212/1048 . . . Scalability
2212/1052 . . . Security improvement
2212/1056 . . . Simplification
2212/1057 . . . Use in a specific computing environment
2212/151 . . . Emulated environment, e.g. virtual machine
2212/152 . . . Virtualized environment, e.g. logically partitioned system
2212/154 . . . Networked environment
2212/16 . . . General purpose computing application
2212/161 . . . Portable computer, e.g. notebook
2212/163 . . . Server or database system
2212/165 . . . Mainframe system
2212/17 . . . Embedded application
2212/171 . . . Portable consumer electronics, e.g. mobile phone
2212/172 . . . Non-portable consumer electronics
2212/1721 . . . Home entertainment system, e.g. television set
2212/173 . . . Vehicle or other transportation
2212/174 . . . Telecommunications system
2212/175 . . . Industrial control system
2212/177 . . . Smart card
2212/178 . . . Electronic token or RFID
2212/20 . . . Employing a main memory using a specific memory technology
2212/202 . . . Non-volatile memory
2212/2022 . . . Flash memory
2212/2024 . . . Rewritable memory not requiring erasing, e.g. resistive or ferroelectric RAM
2212/2028 . . . Battery-backed RAM
2212/205 . . . Hybrid memory, e.g. using both volatile and non-volatile memory
2212/206 . . . Memory mapped I/O
2212/21 . . . Employing a record carrier using a specific recording technology
2212/211 . . . Optical disk storage
2212/2112 . . . with a removable carrier, e.g. DVD
2212/213 . . . Tape storage
2212/214 . . . Solid state disk
2212/2142 . . . using write-once memory, e.g. OTPROM
2212/2146 . . . being detachable, e.g. USB memory
2212/217 . . . Hybrid disk, e.g. using both magnetic and solid state storage devices
2212/22 . . . Employing cache memory using specific memory technology
2212/221 . . . Static RAM
2212/222 . . . Non-volatile memory
2212/2228 . . . Battery-backed RAM
2212/224 . . . Disk storage
2212/225 . . . Hybrid cache memory, e.g. having both volatile and non-volatile portions
2212/25 . . . Using a specific main memory architecture
Caching of specific data in cache memory

2212/20 . . . Local memory within processor subsystem
2212/21 . . . being configurable for different purposes, e.g. as cache or non-cache memory
2212/22 . . . Centralized memory
2212/23 . . . comprising a plurality of modules
2212/24 . . . Distributed memory
2212/25 . . . Non-uniform memory access [NUMA] architecture
2212/26 . . . Using a specific storage system architecture
2212/27 . . . Storage comprising a plurality of storage devices
2212/28 . . . configured as RAID
2212/29 . . . Network storage, e.g. SAN or NAS
2212/30 . . . Remote server
2212/31 . . . Using a specific cache architecture
2212/32 . . . Non-uniform cache access [NUCA] architecture
2212/33 . . . Cache only memory architecture [COMA]
2212/34 . . . Using a specific disk cache architecture
2212/35 . . . Single cache
2212/36 . . . Partitioned cache
2212/37 . . . Plural cache memories
2212/38 . . . being distributed
2212/39 . . . Redundant cache memory
2212/40 . . . Mirrored cache memory
2212/41 . . . Providing cache or TLB in specific location of a processing system
2212/42 . . . In special purpose processing node, e.g. vector processor
2212/43 . . . In image processor or graphics adapter
2212/44 . . . In peripheral interface, e.g. I/O adapter or channel
2212/45 . . . In peripheral device, e.g. printer
2212/46 . . . In main memory subsystem
2212/47 . . . being part of a memory device, e.g. cache DRAM
2212/48 . . . being part of a memory device, e.g. cache
2212/49 . . . In system interconnect, e.g. between two buses
2212/50 . . . Providing disk cache in a specific location of a storage system
2212/51 . . . In host system
2212/52 . . . In storage controller
2212/53 . . . In storage device
2212/54 . . . In storage network, e.g. network attached cache
2212/55 . . . Specific encoding of data in memory or cache
2212/56 . . . Compressed data
2212/57 . . . Encrypted data
2212/58 . . . Error protection encoding, e.g. using parity or ECC codes
2212/59 . . . Caching of specific data in cache memory
2212/60 . . . Stack data
2212/61 . . . Instruction code
2212/62 . . . Microcode or microprogram
2212/63 . . . Vector or matrix data
2212/64 . . . Image or video data
2212/65 . . . Caching storage objects of specific type in disk cache
2212/66 . . . Sector or disk block
2212/67 . . . Track or segment
2212/68 . . . File
2212/69 . . . Multimedia object, e.g. image, video
2212/70 . . . Structured object, e.g. database record
2212/71 . . . Metadata, control data
2212/72 . . . The specific object being partially cached

Details relating to virtual memory and virtual address translation

2212/50 . . . Control mechanisms for virtual memory, cache or TLB
2212/51 . . . using adaptive policy
2212/52 . . . using speculative control
2212/53 . . . Details of cache memory
2212/54 . . . Reconfiguration of cache memory
2212/55 . . . of operating mode, e.g. cache mode or local memory mode
2212/56 . . . Details relating to cache prefetching
2212/57 . . . Using a prefetch buffer or dedicated prefetch cache
2212/58 . . . History based prefetching
2212/59 . . . Prefetching based on access pattern detection, e.g. stride based prefetch
2212/60 . . . Prefetching based on hints or prefetch instructions
2212/61 . . . of operating mode, e.g. cache mode or local memory mode
2212/62 . . . Way prediction in set-associative cache
2212/63 . . . Details relating to cache mapping
2212/64 . . . Way prediction in set-associative cache
2212/65 . . . Details of cache specific to multiprocessor cache arrangements
2212/66 . . . Coherency control relating to peripheral accessing, e.g. from DMA or I/O device
2212/67 . . . State-only directory, i.e. not recording identity of sharing or owning nodes
2212/68 . . . Details of virtual memory and virtual address translation
2212/69 . . . Multi-level translation tables
2212/70 . . . Page size control
2212/71 . . . Page colouring
2212/72 . . . Look-ahead translation
2212/73 . . . Same page detection
2212/74 . . . Address space sharing
2212/75 . . . Virtual address space management
2212/76 . . . Details of translation look-aside buffer [TLB]
2212/77 . . . Multi-level TLB, e.g. microTLB and main TLB
2212/78 . . . Multiprocessor TLB consistency
2212/79 . . . Invalidations
2212/80 . . . TLB miss handling
2212/81 . . . Details relating to dynamic memory management
2212/82 . . . Conservative garbage collection
2212/83 . . . Details relating to flash memory management
2212/84 . . . Logical to physical mapping or translation of blocks or pages
2212/85 . . . Allocation control and policies
2212/86 . . . Temporary buffering, e.g. using volatile buffer or dedicated buffer blocks
2212/87 . . . Capacity control, e.g. partitioning, end-of-life degradation
2212/88 . . . Cleaning, compaction, garbage collection, erase control
2212/89 . . . Reconfiguration of flash memory system
2212/90 . . . management of metadata or control data
2212/91 . . . Multiple device management, e.g. distributing data over multiple flash devices
2212/92 . . . Validity control, e.g. using flags, time stamps or sequence numbers
Indexing scheme relating to interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units

- Serial port, e.g. RS232C
- Parallel ports, e.g. centronics
- Extension to the industry standard architecture [EISA]
- High speed serial bus, e.g. Fiber channel
- High speed serial bus, e.g. IEEE P1394
- Futurebus
- Inter-integrated circuit (I2C)
- Industry standard architecture [ISA]
- Multibus
- Peripheral component interconnect [PCI]
- Serial attached SCSI [SAS]
- Serial ATA [SATA]
- Small computer system interface [SCI]
- System on Chip
- Universal serial bus [USB]
- Versatile modular eurobus [VME]
- Assignment of addresses or identifiers to the modules of a bus system
- Use of address and non-data lines as data lines for specific data transfers to temporarily enlarge the data bus and increase information transfer rate
- Bus-related hardware virtualisation
- Bandwidth consumption reduction during transfers
- Latency reduction in handling transfers
- Memory access
- Use of address and non-data lines as data lines for specific data transfers to temporarily enlarge the data bus and increase information transfer rate
- Bus-related hardware virtualisation
- Bandwidth consumption reduction during transfers
- Latency reduction in handling transfers
- Memory access
- Generation of an interrupt or a group of interrupts after a predetermined number of interrupts
- Generation of an interrupt or a group of interrupts after a fixed or calculated time elapses
- Reducing the frequency of interrupts generated from peripheral to a CPU
- Dispatching of interrupt load among interrupt handlers in processor system or interrupt controller
- Routing of interrupt among interrupt handlers in processor system or interrupt controller
- Determination of the interrupt source among a plurality of incoming interrupts
- Signal interruptions by means of a message
- Sharing of interrupt line among a plurality of interrupt sources
- Interrupt packet, e.g. event
- DMA
- DMA using DMA transfer descriptors
- Systems and methods for controlling the DMA frequency on an access bus
- Space or buffer allocation for DMA transfers
- Very long instruction word DMA
- Arbitration
- Coding information on a single line

Indexing scheme relating to additional aspects of information retrieval not explicitly covered by G06F 16/00 and subgroups

- Automatic library building
- Data mining
- Energy-efficient information retrieval
- Guided tours
- Obsolescence
- Patent retrieval
- Prefetching
- Synchronised browsing
- Web printing

Indexing scheme relating to application aspects of data processing equipment or methods

- Environmental application, e.g. waste reduction, pollution control, compliance with environmental legislation

Indexing scheme relating to security arrangements for protecting computers, components thereof, programs or data against unauthorised activity

- Monitoring users, programs or devices to maintain the integrity of platforms
- Protect user input by software means
- Protect output to user by software means
- Test or assess software
- Test or assess a computer or a system
- Indexing scheme relating to G06F 21/10, protecting distributed programs or content
- Binding
- Device
- Domain
- Location
- Token
- User
- Characteristics
- Domain
- Knowledge
- Content
- Editing
- Personalisation
- Conversion
- On user or administrative requirements
- Watermark
- Restriction at operating system level
Traceability

Enhanced product

Unique instance (G06F 2221/0702 takes precedence)

Emerging technologies

Hiding

Key

Distribution

Generation

Licence

Conversion

Definition

Grace period

Language

Editing

Revocation

Recurrent authorisation

Logging

Return

Transfer

Backup or restore

Fragments

Indirect via third party

Peer-to-Peer [P2P]

Superdistribution

Synchronisation

Transaction with ACID [Atomicity, Consistency, Isolation and Durability] properties

using dedicated hardware at the client

Indexing scheme relating to G06F 21/00 and subgroups addressing additional information or applications relating to security arrangements for protecting computers, components thereof, programs or data against unauthorised activity

Auditing as a secondary aspect

Challenge-response

Dual mode as a secondary aspect

File encryption

Game systems

Location-sensitive, e.g. geographical location, GPS

Multi-level security, e.g. mandatory access control

Third party

User registration

Authenticating web pages, e.g. with suspicious links

Chip on media, e.g. a disk or tape with a chip embedded in its case

Dummy operation

Just-in-time application of countermeasures, e.g., on-the-fly decryption, just-in-time obfuscation or de-obfuscation

Bluffing

Authenticate client device independently of the user

Lost password, e.g. recovery of lost or forgotten passwords

Verifying human interaction, e.g., Captcha

Metering

Time limited access, e.g. to a computer or data