

EUROPEAN PATENT OFFICE
U.S. PATENT AND TRADEMARK OFFICE

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

The following classification changes will be effected by this Notice of Changes:

| <u>Action</u> | <u>Subclass</u> | <u>Group(s)</u> |
|--|-----------------|--|
| SCHEME: | | |
| Symbols Deleted: | G06N | 3/0427, 3/0436, 3/0445, 3/0454, 3/0472, 3/0481, 3/0635 |
| | G06N | 5/003, 5/006 |
| | G06N | 7/005 |
| Symbols New: | G06N | 3/042, 3/043, 3/044, 3/0442, 3/045, 3/0455, 3/0464, 3/047, 3/0475, 3/048, 3/0495, 3/0499, 3/065, 3/0895, 3/09, 3/091, 3/092, 3/094, 3/096, 3/098, 3/0985 |
| | G06N | 5/01, 5/013 |
| | G06N | 7/01 |
| Titles Changed: | G06N | 3/004, 3/006, 3/008, 3/02, 3/04, 3/049, 3/082, 3/084, 3/086, 3/088, 3/10, 3/123, 3/126 |
| | G06N | 5/02, 5/022, 5/025, 5/04, 5/043, 5/045, 5/046, 5/047, 5/048 |
| | G06N | 7/046 |
| Indents Changed: | G06N | 5/025 |
| Warnings New: | G06N | 3/04, 3/044, 3/0442, 3/045, 3/0455, 3/0464, 3/047, 3/0475, 3/0495, 3/0499, 3/08, 3/0895, 3/09, 3/091, 3/092, 3/094, 3/096, 3/098, 3/0985 |
| DEFINITIONS: | | |
| Definitions Deleted: (no frozen (F) symbol definitions should be deleted) | G06N | 3/0427, 3/0436, 3/0445, 3/0454, 3/0472, 3/0481, 3/0635 |
| | G06N | 5/003, 5/006 |
| | G06N | 7/005 |
| Definitions New: | G06N | 3/042, 3/043, 3/044, 3/045, 3/047, 3/048, 3/065 |
| | G06N | 5/01, 5/013 |
| | G06N | 7/01 |
| Definitions Modified: | G06N | 3/00, 3/02 |
| | G06N | 5/041, 5/042 |

The following subclasses/groups are also impacted by this Notice of Changes (indicate subclasses/groups outside of the project scope, such as those listed in the CRL):

G06F11/3608, G05B13/00, G06F17/10, G06F17/11

This Notice of Changes includes the following [Check the ones included]:

1. CLASSIFICATION SCHEME CHANGES

- A. New, Modified or Deleted Group(s)
- B. New, Modified or Deleted Warning(s)
- C. New, Modified or Deleted Note(s)

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

D. New, Modified or Deleted Guidance Heading(s)

2. DEFINITIONS

A. New or Modified Definitions (Full definition template)

B. Modified or Deleted Definitions (Definitions Quick Fix)

3. REVISION CONCORDANCE LIST (RCL)

4. CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)

5. CHANGES TO THE CROSS-REFERENCE LIST (CRL)

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

1. CLASSIFICATION SCHEME CHANGES

A. New, Modified or Deleted Group(s)

SUBCLASS G06N - COMPUTING ARRANGEMENTS BASED ON SPECIFIC COMPUTATIONAL MODELS

| <u>Type*</u> | <u>Symbol</u> | <u>Indent Level</u> <u>Number of</u> <u>dots (e.g.</u> <u>0, 1, 2)</u> | <u>Title</u> <u>“CPC only” text should normally be</u> <u>enclosed in {curly brackets}**</u> | <u>Transferred to#</u> |
|--------------|---------------|---|---|--|
| U | G06N 3/00 | 0 | Computing arrangements based on biological models | |
| M | G06N 3/004 | 1 | Artificial life, i.e. computing arrangements simulating life | |
| M | G06N 3/006 | 2 | based on simulated virtual individual or collective life forms, e.g. social simulations or particle swarm optimisation [PSO] | |
| M | G06N 3/008 | 2 | based on physical entities controlled by simulated intelligence so as to replicate intelligent life forms, e.g. based on robots replicating pets or humans in their appearance or behaviour | |
| M | G06N 3/02 | 1 | Neural networks | |
| C | G06N 3/04 | 2 | Architecture, e.g. interconnection topology | G06N 3/04, G06N 3/0464, G06N 3/0475, G06N 3/0495, G06N 3/0499 |
| U | G06N 3/0409 | 3 | {Adaptive resonance theory [ART] networks} | |
| U | G06N 3/0418 | 3 | {using chaos or fractal principles} | |
| N | G06N 3/042 | 3 | Knowledge-based neural networks; Logical representations of neural networks | |
| D | G06N 3/0427 | 3 | {in combination with an expert system} | <administrative transfer to G06N 3/042> |
| N | G06N 3/043 | 3 | based on fuzzy logic, fuzzy membership or fuzzy inference, e.g. adaptive neuro-fuzzy inference systems [ANFIS] | |
| D | G06N 3/0436 | 3 | {in combination with fuzzy logic} | <administrative transfer to G06N 3/043> |
| Q | G06N 3/044 | 3 | Recurrent networks, e.g. Hopfield networks | G06N 3/044, G06N 3/0442 |
| D | G06N 3/0445 | 3 | {Feedback networks, e.g. hopfield nets, associative networks} | <administrative transfer to G06N 3/044> |

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

| | | | | |
|---|-------------|---|--|--|
| N | G06N 3/0442 | 4 | characterised by memory or gating, e.g. long short-term memory [LSTM] or gated recurrent units [GRU] | |
| Q | G06N 3/045 | 3 | Combinations of networks | G06N 3/045, G06N 3/0455 |
| D | G06N 3/0454 | 3 | {using a combination of multiple neural nets} | <administrative transfer to G06N 3/045> |
| N | G06N 3/0455 | 4 | Auto-encoder networks ; Encoder-decoder networks | |
| U | G06N 3/0463 | 3 | {Neocognitrons} | |
| N | G06N 3/0464 | 3 | Convolutional networks [CNN, ConvNet] | |
| Q | G06N 3/047 | 3 | Probabilistic or stochastic networks | G06N 3/047, G06N 3/0475 |
| D | G06N 3/0472 | 3 | {using probabilistic elements, e.g. p-rans, stochastic processors} | <administrative transfer to G06N 3/047 > |
| N | G06N 3/0475 | 3 | Generative networks | |
| N | G06N 3/048 | 3 | Activation functions | |
| D | G06N 3/0481 | 3 | {Non-linear activation functions, e.g. sigmoids, thresholds} | <administrative transfer to G06N 3/048> |
| M | G06N 3/049 | 3 | Temporal neural networks, e.g. delay elements, oscillating neurons or pulsed inputs | |
| N | G06N 3/0495 | 3 | Quantised networks ; Sparse networks ; Compressed networks | |
| N | G06N 3/0499 | 3 | Feedforward networks | |
| U | G06N 3/06 | 2 | Physical realisation, i.e. hardware implementation of neural networks, neurons or parts of neurons | |
| U | G06N 3/061 | 3 | {using biological neurons, e.g. biological neurons connected to an integrated circuit} | |
| U | G06N 3/063 | 3 | using electronic means | |
| D | G06N 3/0635 | 4 | {using analogue means} | <administrative transfer to G06N 3/065> |
| N | G06N 3/065 | 4 | Analogue means | |
| U | G06N 3/067 | 3 | using optical means | |
| U | G06N 3/0675 | 4 | {using electro-optical, acousto-optical or opto-electronic means} | |
| C | G06N 3/08 | 2 | Learning methods | G06N 3/08, G06N 3/0895, G06N 3/09, G06N 3/091, G06N 3/092, G06N 3/094, G06N 3/096, G06N 3/098, G06N 3/0985 |

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

| | | | | |
|---|-------------|---|--|---|
| M | G06N 3/082 | 3 | modifying the architecture, e.g. adding, deleting or silencing nodes or connections | |
| M | G06N 3/084 | 3 | Backpropagation, e.g. using gradient descent | |
| M | G06N 3/086 | 3 | using evolutionary algorithms, e.g. genetic algorithms or genetic programming | |
| M | G06N 3/088 | 3 | Non-supervised learning, e.g. competitive learning | |
| N | G06N 3/0895 | 3 | Weakly supervised learning, e.g. semi-supervised or self-supervised learning | |
| N | G06N 3/09 | 3 | Supervised learning | |
| N | G06N 3/091 | 3 | Active learning | |
| N | G06N 3/092 | 3 | Reinforcement learning | |
| N | G06N 3/094 | 3 | Adversarial learning | |
| N | G06N 3/096 | 3 | Transfer learning | |
| N | G06N 3/098 | 3 | Distributed learning, e.g. federated learning | |
| N | G06N 3/0985 | 3 | Hyperparameter optimisation; Meta-learning; Learning-to-learn | |
| M | G06N 3/10 | 2 | Interfaces, programming languages or software development kits, e.g. for simulating neural networks | |
| U | G06N 3/12 | 1 | using genetic models | |
| M | G06N 3/123 | 2 | DNA computing | |
| M | G06N 3/126 | 2 | Evolutionary algorithms, e.g. genetic algorithms or genetic programming | |
| U | G06N 5/00 | 0 | Computing arrangements using knowledge-based models | |
| D | G06N 5/003 | 1 | {Dynamic search techniques; Heuristics; Dynamic trees; Branch-and-bound} | <administrative transfer to G06N 5/01> |
| D | G06N 5/006 | 2 | {Automatic theorem proving} | <administrative transfer to G06N 5/013> |
| N | G06N 5/01 | 1 | Dynamic search techniques; Heuristics; Dynamic trees; Branch-and-bound | |
| N | G06N 5/013 | 2 | {Automatic theorem proving} | |
| M | G06N 5/02 | 1 | Knowledge representation; Symbolic representation | |
| M | G06N 5/022 | 2 | Knowledge engineering; Knowledge acquisition | |
| M | G06N 5/025 | 3 | Extracting rules from data | |
| U | G06N 5/027 | 2 | {Frames } | |
| M | G06N 5/04 | 1 | Inference or reasoning models | |
| U | G06N 5/041 | 2 | {Abduction} | |
| U | G06N 5/042 | 2 | {Backward inferencing } | |
| M | G06N 5/043 | 2 | Distributed expert systems; Blackboards | |
| M | G06N 5/045 | 2 | Explanation of inference; Explainable artificial intelligence [XAI]; Interpretable artificial intelligence | |

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

| | | | | |
|---|------------|---|---|--|
| M | G06N 5/046 | 2 | Forward inferencing; Production systems | |
| M | G06N 5/047 | 3 | Pattern matching networks; Rete networks | |
| M | G06N 5/048 | 2 | Fuzzy inferencing | |
| U | G06N 7/00 | 0 | Computing arrangements based on specific mathematical models | |
| D | G06N 7/005 | 1 | {Probabilistic networks } | <administrative transfer to G06N 7/01> |
| N | G06N 7/01 | 1 | Probabilistic graphical models, e.g. probabilistic networks | |
| M | G06N 7/046 | 3 | {Implementation by means of a neural network (neural networks using fuzzy logic G06N3/043)} | |

*N = new entries where reclassification into entries is involved; C = entries with modified file scope where reclassification of documents from the entries is involved; Q = new entries which are firstly populated with documents via administrative transfers from deleted (D) entries. Afterwards, the transferred documents into the Q entry will either stay or be moved to more appropriate entries, as determined by intellectual reclassification; T = existing entries with enlarged file scope, which receive documents from C or D entries, e.g. when a limiting reference is removed from the entry title; M = entries with no change to the file scope (no reclassification); D = deleted entries; F = frozen entries will be deleted once reclassification of documents from the entries is completed; U = entries that are unchanged.

NOTES:

- **No {curly brackets} are used for titles in CPC only subclasses, e.g. C12Y, A23Y; 2000 series symbol titles of groups found at the end of schemes (orthogonal codes); or the Y section titles. The {curly brackets} are used for 2000 series symbol titles found interspersed throughout the main trunk schemes (breakdown codes).
- U groups: it is obligatory to display the required “anchor” symbol (U group), i.e. the entry immediately preceding a new group or an array of new groups to be created (in case new groups are not clearly subgroups of C-type groups). Always include the symbol, indent level and title of the U group in the table above.
- All entry types should be included in the scheme changes table above for better understanding of the overall scheme change picture. Symbol, indent level, and title are required for all types.
- “Transferred to” column must be completed for all C, D, F, and Q type entries. F groups will be deleted once reclassification is completed.
- When multiple symbols are included in the “Transferred to” column, avoid using ranges of symbols in order to be as precise as possible.
- For administrative transfer of documents, the following text should be used: “<administrative transfer to XX>”, “<administrative transfer to XX and YY simultaneously>”, or “<administrative transfer to XX, YY, ...and ZZ simultaneously>” when administrative transfer of the same documents is to more than one place.
- Administrative transfer to main trunk groups is assumed to be the source allocation type, unless otherwise indicated.
- Administrative transfer to 2000/Y series groups is assumed to be “additional information”.
- If needed, instructions for allocation type should be indicated within the angle brackets using the abbreviations “ADD” or “INV”: <administrative transfer to XX ADD> , <administrative transfer to XX INV>, or <administrative transfer to XX ADD, YY INV, ... and ZZ ADD simultaneously>.
- In certain situations, the “D” entries of 2000-series or Y-series groups may not require a destination (“Transferred to”) symbol, however it is required to specify “<no transfer>” in the “Transferred to” column for such cases.
- For finalization projects, the deleted “F” symbols should have <no transfer> in the “Transferred to” column.
- For more details about the types of scheme change, see CPC Guide.

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

B. New, Modified or Deleted Warning(s)

SUBCLASS G06N - COMPUTING ARRANGEMENTS BASED ON SPECIFIC COMPUTATIONAL MODELS

| <u>Type*</u> | <u>Location</u> | <u>Old Warning</u> | <u>New/Modified Warning</u> |
|--------------|-----------------|--------------------|---|
| N | G06N 3/04 | | Group G06N 3/04 is impacted by reclassification into groups G06N 3/0464, G06N 3/0475, G06N 3/0495 and G06N 3/0499. All groups listed in this Warning should be considered in order to perform a complete search. |
| N | G06N 3/044 | | Group G06N 3/044 is impacted by reclassification into group G06N 3/0442. Groups G06N 3/044 and G06N 3/0442 should be considered in order to perform a complete search. |
| N | G06N 3/0442 | | Group G06N 3/0442 is incomplete pending reclassification of documents from group G06N 3/044. Groups G06N 3/044 and G06N 3/0442 should be considered in order to perform a complete search. |
| N | G06N 3/045 | | Group G06N 3/045 is impacted by reclassification into group G06N 3/0455. Groups G06N 3/045 and G06N 3/0455 should be considered in order to perform a complete search. |
| N | G06N 3/0455 | | Group G06N 3/0455 is incomplete pending reclassification of documents from group G06N 3/045. Groups G06N 3/045 and G06N 3/0455 should be considered in order to perform a complete search. |
| N | G06N 3/0464 | | Group G06N 3/0464 is incomplete pending reclassification of documents from group G06N 3/04. Groups G06N 3/04 and G06N 3/0464 should be considered in order to perform a complete search. |
| N | G06N 3/047 | | Group G06N 3/047 is impacted by reclassification into group G06N 3/0475. Groups G06N 3/047 and G06N 3/0475 should be considered in order to perform a complete search. |
| N | G06N 3/0475 | | Group G06N 3/0475 is incomplete pending reclassification of documents from groups G06N 3/04 and G06N 3/047. Groups G06N 3/04, G06N 3/047, and G06N 3/0475 should be considered in order to perform a complete search. |
| N | G06N 3/0495 | | Group G06N 3/0495 is incomplete pending reclassification of documents from group G06N 3/04. Groups G06N 3/04 and |

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

| <u>Type*</u> | <u>Location</u> | <u>Old Warning</u> | <u>New/Modified Warning</u> |
|---------------------|------------------------|---------------------------|---|
| | | | G06N 3/0495 should be considered in order to perform a complete search. |
| N | G06N 3/0499 | | Group G06N 3/0499 is incomplete pending reclassification of documents from group G06N 3/04. Groups G06N 3/04 and G06N 3/0499 should be considered in order to perform a complete search. |
| N | G06N 3/08 | | Group G06N 3/08 is impacted by reclassification into groups G06N 3/0895, G06N 3/09, G06N 3/091, G06N 3/092, G06N 3/094, G06N 3/096, G06N 3/098 and G06N 3/0985. All groups listed in this Warning should be considered in order to perform a complete search. |
| N | G06N 3/0895 | | Group G06N 3/0895 is incomplete pending reclassification of documents from group G06N 3/08. Groups G06N 3/08 and G06N 3/0895 should be considered in order to perform a complete search. |
| N | G06N 3/09 | | Group G06N 3/09 is incomplete pending reclassification of documents from group G06N 3/08. Groups G06N 3/08 and G06N 3/09 should be considered in order to perform a complete search. |
| N | G06N 3/091 | | Group G06N 3/091 is incomplete pending reclassification of documents from group G06N 3/08. Groups G06N 3/08 and G06N 3/091 should be considered in order to perform a complete search. |
| N | G06N 3/092 | | Group G06N 3/092 is incomplete pending reclassification of documents from group G06N 3/08. Groups G06N 3/08 and G06N 3/092 should be considered in order to perform a complete search. |
| N | G06N 3/094 | | Group G06N 3/094 is incomplete pending reclassification of documents from group G06N 3/08. Groups G06N 3/08 and G06N 3/094 should be considered in order to perform a complete search. |
| N | G06N 3/096 | | Group G06N 3/096 is incomplete pending reclassification of documents from group G06N 3/08. Groups G06N 3/08 and G06N 3/096 should be considered in order to perform a complete search. |
| N | G06N 3/098 | | Group G06N 3/098 is incomplete pending reclassification of documents from group G06N 3/08. Groups G06N 3/08 and G06N 3/098 should be considered in order to perform a complete search. |

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

| <u>Type*</u> | <u>Location</u> | <u>Old Warning</u> | <u>New/Modified Warning</u> |
|--------------|-----------------|--------------------|--|
| N | G06N 3/0985 | | Group G06N 3/0985 is incomplete pending reclassification of documents from group G06N 3/08. Groups G06N 3/08 and G06N 3/0985 should be considered in order to perform a complete search. |

*N = new warning, M = modified warning, D = deleted warning

NOTE: The "Location" column only requires the symbol PRIOR to the location of the warning. No further directions such as "before" or "after" are required.

2. A. Definitions (new)

G06N3/042

Definition statement

This place covers:

Combinations of neural network technology and expert system technology.

Contains documents where expert systems and neural networks work together on the same level and also where expert systems are used to construct or control a neural network.

References:

Informative references:

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

| |
|-------------------------------|
| Inference or reasoning models |
|-------------------------------|

| |
|---------------------------|
| G06N 5/04 |
|---------------------------|

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- “rule-based neural network” and “knowledge-based neural network”

G06N3/043

Definition statement

This place covers:

Combinations of neural network technology and fuzzy logic system technology.

Contains documents where fuzzy logic and neural networks work together on the same level, and also where fuzzy logic systems are used to construct or control a neural network.

References:

Informative references:

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

| | |
|--------------------|---------------------------|
| Fuzzy logic per se | G06N 7/02 |
|--------------------|---------------------------|

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

| | |
|-------|--|
| ANFIS | Adaptive Neuro-Fuzzy Inference Systems |
|-------|--|

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- “Adaptive neuro-fuzzy interference system (ANFIS)” and “Neuro-fuzzy interference system”

G06N3/044

Definition statement

This place covers:

Neural networks involving connections from the output of a neural network to the inputs of the same neural network.

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- “feedback network” and “recurrent neural network”
- “Hopfield nets” and “associative networks”

DATE: JANUARY 1, 2023

PROJECT RP11914

G06N3/045

Definition statement

This place covers:

Architecture of multiple neural networks can be connected in a parallel or in a series fashion. They can cooperate on the same level or one neural network can control other neural networks.

Parallel neural networks can also be used for fault tolerance when connecting to a voting system.

Several neural networks can also be trained in different ways or with different training examples and then combined in parallel in order to increase the reliability or accuracy.

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- “multiple neural networks” and “parallel neural networks”
- “hierarchical neural networks” and “ensemble neural networks”

G06N3/047

Definition statement

This place covers:

Neural networks having as special feature that the neurons individually, or the weights connecting the neurons, or the architecture as a whole, have a probabilistic or statistical aspect.

References:

Informative references:

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

| | |
|--------------------------------------|-------------|
| Chaotic determination of the weights | G06N 3/0418 |
|--------------------------------------|-------------|

DATE: JANUARY 1, 2023

PROJECT RP11914

| | |
|---|------------|
| Neural networks based on fuzzy logic, fuzzy membership or fuzzy inference | G06N 3/043 |
| Probabilistic graphical models, e.g. probabilistic networks | G06N 7/01 |

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- “probabilistic neural network” and “PNN”
- “statistical neuron function” and “stochastic neuron function”
- “p-RAM” and “probabilistic RAM”

G06N3/048

Definition statement

This place covers:

All aspects of non-linear activation functions used in neurons, e.g. sigmoids, simple stepwise threshold functions, approximated sigmoid functions.

Only aspects of the non-linear activation function.

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- “sigmoid” and “logistic function”
- “non-linear activation function” and “non-linear transfer function”
- “approximated activation functions” and “piecewise linear activation function”

DATE: JANUARY 1, 2023

PROJECT RP11914

G06N3/065

Definition statement

This place covers:

Neurons or interconnections implemented in dedicated analog electronics.

References:

Informative references:

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

| | |
|--|---------------------------|
| Analog electronic computers in general | G06G 7/00 |
|--|---------------------------|

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- “analogue” and “analog”

G06N5/01

Definition statement

This place covers:

Systems using knowledge empirically, Heuristics. Systems based on empirical models are normally used when classic methods fail to find an exact solution in a short time.

References:

Application-oriented references:

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

DATE: JANUARY 1, 2023

PROJECT RP11914

| | |
|---|------------|
| Use of these techniques in computer games | A63F 13/00 |
| Use of these techniques for solving equations | G06F 17/10 |
| Forecasting or optimisation specifically adapted for administration or management | G06Q 10/04 |
| ICT specially adapted for medical diagnosis, medical simulation or medical data mining; ICT specially adapted for detecting, monitoring or modelling epidemics or pandemics | G16H 50/00 |

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- “dynamic search” and “adaptive search”
- “branch-and-bound” and “decision trees”
- “constraint solver” and “constraint optimization”
- “empirical optimization” and “sample average approximation”

G06N5/013

Definition statement

This place covers:

Automatic theorem proving; constraint satisfaction; probability consistency check in a decision problem.

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- “logical consistency” and “automatic proving” and “formula checker”
- “verification” and “determination of probability” and “formula converter”

DATE: JANUARY 1, 2023

PROJECT RP11914

G06N7/01**Definition statement***This place covers:*

Inference system representing the probability dependencies between causes and effects in a directed acyclic graph model in which the inferences are modelled as the propagation of probabilities.

Relationships with other classification places

Classification in this group is not expected when probabilistic networks are used in neural networks (e.g. Boltzmann machines).

Applications of whatever sort just using Bayesian or Markov models with no description of the Bayesian or Markov model itself are to be classified in the relevant application field.

Learning of unknown parameters of the network to be classified also in [G06N 20/00](#).

References:***Application-oriented references:***

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

| | |
|--|----------------------------|
| Game playing | A63F 13/00 |
| Digital data processing | G06F |
| Documents classification and information retrieval | G06F 16/00 |
| Pattern recognition | G06F 18/00 |
| Speech recognition | G10L 15/00 |

Informative references:

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

| | |
|--|----------------------------|
| Recurrent networks, e.g. Hopfield networks | G06N 3/044 |
|--|----------------------------|

| |
|--------------------------------------|
| Probabilistic or stochastic networks |
|--------------------------------------|

| |
|----------------------------|
| G06N 3/047 |
|----------------------------|

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- “Bayesian network” and “Bayes network” and “belief network” and “generalised Bayesian network”
- “directed acyclic graphical model” and “DAG” and “probabilistic graphical model” and “probability node”
- “beliefs propagation” and “influence diagram” and “conditional dependencies” and “probability function” and “probability density function” and “Bayes theorem”
- “Markov model” and “Markov chain” and “Markov network” and “Markov random field” and “Markov decision process” and “conditional random fields”

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

2. B. DEFINITIONS QUICK FIX

| <u>Symbol</u> | <u>Location of change</u> (e.g., section title) | <u>Existing reference symbol or text</u> | <u>Action; New symbol; New text</u> |
|---------------|--|---|--|
| G06N3/00 | Informative references | Probabilistic networks G06N7/005 | <u>Replace</u> with: Probabilistic networks G06N 7/01 |
| G06N 3/02 | Application Oriented references | Pattern recognition using neural networks G06K 9/00 | <u>Replace</u> with the following NEW informative reference: Pattern recognition G06F 18/00 |
| G06N 3/0427 | Definition | | Delete entire Definition |
| G06N 3/0436 | Definition | | Delete entire Definition |
| G06N 3/0445 | Definition | | Delete entire Definition |
| G06N 3/0454 | Definition | | Delete entire Definition |
| G06N 3/0472 | Definition | | Delete entire Definition |
| G06N 3/0481 | Definition | | Delete entire Definition |
| G06N 3/0635 | Definition | | Delete entire Definition |
| G06N 5/003 | Definition | | Delete entire Definition |
| G06N 5/006 | Definition | | Delete entire Definition |
| G06N5/041 | Informative references | Empirical guesses or heuristics G06N5/003 | <u>Replace</u> with: Empirical guesses or heuristics G06N 5/01 |
| G06N5/042 | Informative references | Automatic theorem proving G06N5/006 | <u>Replace</u> with: Automatic theorem proving G06N5/013 |
| G06N 7/005 | Definition | | Delete entire Definition |

NOTES:

- The table above is used for corrections or modifications to existing definitions, e.g. delete an entire definition or part thereof; propose new wording or modify wording of a section, change the symbol the definition is associated with, change or delete a reference symbol, etc.
- Do not delete (F) symbol definitions.

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

3. REVISION CONCORDANCE LIST (RCL)

| Type* | From CPC Symbol (existing) | To CPC Symbol(s) |
|--------------|-----------------------------------|--|
| C | G06N 3/04 | G06N 3/04, G06N 3/0464, G06N 3/0475, G06N 3/0495, G06N 3/0499 |
| D | G06N 3/0427 | <administrative transfer to G06N 3/042> |
| D | G06N 3/0436 | <administrative transfer to G06N 3/043> |
| Q | G06N 3/044 | G06N 3/044, G06N 3/0442 |
| D | G06N 3/0445 | <administrative transfer to G06N 3/044> |
| Q | G06N 3/045 | G06N 3/045, G06N 3/0455 |
| D | G06N 3/0454 | <administrative transfer to G06N 3/045> |
| Q | G06N 3/047 | G06N 3/047, G06N 3/0475 |
| D | G06N 3/0472 | <administrative transfer to G06N 3/047 > |
| D | G06N 3/0481 | <administrative transfer to G06N 3/048> |
| D | G06N 3/0635 | <administrative transfer to G06N 3/065> |
| C | G06N 3/08 | G06N 3/08, G06N 3/0895, G06N 3/09, G06N 3/091, G06N 3/092, G06N 3/094, G06N 3/096, G06N 3/098, G06N 3/0985 |
| D | G06N 5/003 | <administrative transfer to G06N 5/01> |
| D | G06N 5/006 | <administrative transfer to G06N 5/013> |
| D | G06N 7/005 | <administrative transfer to G06N 7/01> |

* C = entries with modified file scope where reclassification of documents from the entries is involved; Q = new entries which are firstly populated with documents via administrative transfers from deleted (D) entries. Afterwards, the transferred documents into the Q entry will either stay or be moved to more appropriate entries, as determined by intellectual reclassification; D = deleted entries; F = frozen entries will be deleted once reclassification of documents from the entries is completed.

NOTES:

- Only C, D, F, and Q type entries are included in the table above.
- When multiple symbols are included in the “To” column, do not use ranges of symbols.
- For administrative transfer of documents, the following text should be used: “< administrative transfer to XX>”, “<administrative transfer to XX and YY simultaneously>”, or “<administrative transfer to XX, YY, ...and ZZ simultaneously>” when administrative transfer of the same documents is to more than one place.
- Administrative transfer to main trunk groups is assumed to be the source allocation type, unless otherwise indicated.
- Administrative transfer to 2000/Y series groups is assumed to be “additional information”.
- If needed, instructions for allocation type should be indicated within the angle brackets using the abbreviations “ADD” or “INV”: <administrative transfer to XX ADD>, <administrative transfer to XX INV>, or < administrative transfer to XX ADD, YY INV, ... and ZZ ADD simultaneously>.
- In certain situations, the “D” entries of 2000-series or Y-series groups may not require a destination (“To”) symbol, however it is required to specify “<no transfer>” in the “To” column for such cases.
- RCL is not needed for finalisation projects.

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

4. CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)

| <u>CPC</u> | <u>IPC</u> | <u>Action*</u> |
|-------------|-------------|----------------|
| G06N 3/004 | G06N 3/004 | UPDATED |
| G06N 3/006 | G06N 3/006 | UPDATED |
| G06N 3/008 | G06N 3/008 | UPDATED |
| G06N 3/042 | G06N 3/042 | NEW |
| G06N 3/0427 | | DELETE |
| G06N 3/043 | G06N 3/043 | NEW |
| G06N 3/0436 | | DELETE |
| G06N 3/044 | G06N 3/044 | NEW |
| G06N 3/0442 | G06N 3/0442 | NEW |
| G06N 3/0445 | | DELETE |
| G06N 3/045 | G06N 3/045 | NEW |
| G06N 3/0454 | | DELETE |
| G06N 3/0455 | G06N 3/0455 | NEW |
| G06N 3/0464 | G06N 3/0464 | NEW |
| G06N 3/047 | G06N 3/047 | NEW |
| G06N 3/0472 | | DELETE |
| G06N 3/0475 | G06N 3/0475 | NEW |
| G06N 3/048 | G06N 3/048 | NEW |
| G06N 3/0481 | | DELETE |
| G06N 3/049 | G06N 3/049 | UPDATED |
| G06N 3/0495 | G06N 3/0495 | NEW |
| G06N 3/0499 | G06N 3/0499 | NEW |
| G06N 3/0635 | | DELETE |
| G06N 3/065 | G06N 3/065 | NEW |
| G06N 3/082 | G06N 3/082 | UPDATED |
| G06N 3/084 | G06N 3/084 | UPDATED |
| G06N 3/086 | G06N 3/086 | UPDATED |
| G06N 3/088 | G06N 3/088 | UPDATED |
| G06N 3/0895 | G06N 3/0895 | NEW |
| G06N 3/09 | G06N 3/09 | NEW |
| G06N 3/091 | G06N 3/091 | NEW |
| G06N 3/092 | G06N 3/092 | NEW |
| G06N 3/094 | G06N 3/094 | NEW |
| G06N 3/096 | G06N 3/096 | NEW |
| G06N 3/098 | G06N 3/098 | NEW |
| G06N 3/0985 | G06N 3/0985 | NEW |
| G06N 3/123 | G06N 3/123 | UPDATED |
| G06N 3/126 | G06N 3/126 | UPDATED |
| G06N 5/003 | | DELETE |
| G06N 5/006 | | DELETE |

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

| <u>CPC</u> | <u>IPC</u> | <u>Action*</u> |
|-------------------|-------------------|-----------------------|
| G06N 5/01 | G06N 5/01 | NEW |
| G06N 5/013 | G06N 5/01 | NEW |
| G06N 5/022 | G06N 5/022 | UPDATED |
| G06N 5/025 | G06N 5/025 | UPDATED |
| G06N 5/043 | G06N 5/043 | UPDATED |
| G06N 5/045 | G06N 5/045 | UPDATED |
| G06N 5/046 | G06N 5/046 | UPDATED |
| G06N 5/047 | G06N 5/047 | UPDATED |
| G06N 5/048 | G06N 5/048 | UPDATED |
| G06N 7/005 | | DELETE |
| G06N 7/01 | G06N 7/01 | NEW |

* Action column:

- For an (N) or (Q) entry, provide an IPC symbol and complete the Action column with “NEW.”
- For an existing CPC main trunk entry or indexing entry where the existing IPC symbol needs to be changed, provide an UPDATEDdIPC symbol and complete the Action column with “UPDATED.”
- For a (D) CPC entry or indexing entry complete the Action column with “DELETE.” IPC symbol does not need to be included in the IPC column.
- For an (N) 2000 series CPC entry which is positioned within the main trunk scheme (breakdown code) provide an IPC symbol and complete the action column with “NEW”.
- For an (N) 2000 series CPC entry positioned at the end of the CPC scheme (orthogonal code), with no IPC equivalent, complete the IPC column with “CPCONLY” and complete the action column with “NEW”.

NOTES:

- F symbols are not included in the CICL table above.
- T and M symbols are not included in the CICL table above unless a change to the existing IPC is desired.

CPC NOTICE OF CHANGES 1380

DATE: JANUARY 1, 2023

PROJECT RP11914

5. CROSS-REFERENCE LIST (CRL)

Scheme references impacted by this revision project

| <u>Location of reference to be changed</u> | <u>Referenced subclass or group to be changed</u> | <u>Action; New reference symbol; New text</u> |
|--|---|---|
| G06F11/3608 | G06N5/006 | G06N 5/013 |

Definitions references impacted by this revision project

| <u>Location of reference to be changed</u> | <u>Referenced subclass or group to be changed</u> | <u>Section of definition</u> | <u>Action; New reference symbol; New text</u> |
|--|---|------------------------------|---|
| G05B13/00 | G06N3/0436 | Informative references | G06N 3/043 |
| G06F17/10 | G06N7/005 | Informative references | G06N 7/01 |
| G06F17/11 | G06N5/003 | Informative references | G06N 5/01 |

NOTES:

- The CRL tables above are used for changes to locations **outside** of the project scope. Changes to references in scheme titles or definitions **inside** the project scope will be reflected in the “scheme change” template or one of the “definition” templates.
- In addition to other changes proposed in the tables above, in the column titled “Referenced subclass or group to be changed,” **referenced** D symbols should indicate an action of “delete” or should indicate a replacement symbol and **referenced** F symbols should indicate a replacement symbol.
- When a reference is deleted, text related to that reference will also be deleted unless other references or a range of references associated with the same text remain.