

CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS (NOTES omitted)

INSTRUMENTS

G06 COMPUTING; CALCULATING OR COUNTING (NOTES omitted)

G06N COMPUTING ARRANGEMENTS BASED ON SPECIFIC COMPUTATIONAL MODELS

WARNING

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.

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| <p>3/00 Computing arrangements based on biological models</p> <p>3/002 . {Biomolecular computers, i.e. using biomolecules, proteins, cells (using DNA G06N 3/123; using neurons G06N 3/061) }</p> <p>3/004 . Artificial life, i.e. computing arrangements simulating life</p> <p>3/006 . . based on simulated virtual individual or collective life forms, e.g. social simulations or particle swarm optimisation [PSO]</p> <p>3/008 . . 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</p> <p>3/02 . Neural networks</p> <p>3/04 . . Architecture, e.g. interconnection topology</p> <p><u>WARNING</u></p> <p>Group G06N 3/04 is impacted by reclassification into groups G06N 3/0464, G06N 3/0475, G06N 3/0495 and G06N 3/0499.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p> <p>3/0409 . . . {Adaptive resonance theory [ART] networks}</p> <p>3/0418 . . . {using chaos or fractal principles}</p> <p>3/042 . . . Knowledge-based neural networks; Logical representations of neural networks</p> <p>3/043 . . . based on fuzzy logic, fuzzy membership or fuzzy inference, e.g. adaptive neuro-fuzzy inference systems [ANFIS]</p> <p>3/044 . . . Recurrent networks, e.g. Hopfield networks</p> <p><u>WARNING</u></p> <p>Group G06N 3/044 is impacted by reclassification into group G06N 3/0442.</p> <p>Groups G06N 3/044 and G06N 3/0442 should be considered in order to perform a complete search.</p> | <p>3/0442 characterised by memory or gating, e.g. long short-term memory [LSTM] or gated recurrent units [GRU]</p> <p><u>WARNING</u></p> <p>Group G06N 3/0442 is incomplete pending reclassification of documents from group G06N 3/044.</p> <p>Groups G06N 3/044 and G06N 3/0442 should be considered in order to perform a complete search.</p> <p>3/045 . . . Combinations of networks</p> <p><u>WARNING</u></p> <p>Group G06N 3/045 is impacted by reclassification into group G06N 3/0455.</p> <p>Groups G06N 3/045 and G06N 3/0455 should be considered in order to perform a complete search.</p> <p>3/0455 Auto-encoder networks; Encoder-decoder networks</p> <p><u>WARNING</u></p> <p>Group G06N 3/0455 is incomplete pending reclassification of documents from group G06N 3/045.</p> <p>Groups G06N 3/045 and G06N 3/0455 should be considered in order to perform a complete search.</p> <p>3/0463 . . . {Neocognitrons}</p> <p>3/0464 . . . Convolutional networks [CNN, ConvNet]</p> <p><u>WARNING</u></p> <p>Group G06N 3/0464 is incomplete pending reclassification of documents from group G06N 3/04.</p> <p>Groups G06N 3/04 and G06N 3/0464 should be considered in order to perform a complete search.</p> |
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- 3/047 . . . Probabilistic or stochastic networks
WARNING
 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.
- 3/0475 . . . Generative networks
WARNING
 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.
- 3/048 . . . Activation functions
 3/049 . . . Temporal neural networks, e.g. delay elements, oscillating neurons or pulsed inputs
 3/0495 . . . Quantised networks; Sparse networks; Compressed networks
WARNING
 Group [G06N 3/0495](#) is incomplete pending reclassification of documents from group [G06N 3/04](#).
 Groups [G06N 3/04](#) and [G06N 3/0495](#) should be considered in order to perform a complete search.
- 3/0499 . . . Feedforward networks
WARNING
 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.
- 3/06 . . Physical realisation, i.e. hardware implementation of neural networks, neurons or parts of neurons
 3/061 . . . {using biological neurons, e.g. biological neurons connected to an integrated circuit}
 3/063 . . . using electronic means
 3/065 Analogue means
 3/067 . . . using optical means
 3/0675 {using electro-optical, acousto-optical or opto-electronic means}
 3/08 . . Learning methods
WARNING
 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.
- 3/082 . . . modifying the architecture, e.g. adding, deleting or silencing nodes or connections
- 3/084 . . . Backpropagation, e.g. using gradient descent
 3/086 . . . using evolutionary algorithms, e.g. genetic algorithms or genetic programming
 3/088 . . . Non-supervised learning, e.g. competitive learning
 3/0895 . . . Weakly supervised learning, e.g. semi-supervised or self-supervised learning
WARNING
 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.
- 3/09 . . . Supervised learning
WARNING
 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.
- 3/091 . . . Active learning
WARNING
 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.
- 3/092 . . . Reinforcement learning
WARNING
 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.
- 3/094 . . . Adversarial learning
WARNING
 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.
- 3/096 . . . Transfer learning
WARNING
 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.

- 3/098 . . . Distributed learning, e.g. federated learning
- WARNING**
- 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.
- 3/0985 . . . Hyperparameter optimisation; Meta-learning; Learning-to-learn
- WARNING**
- 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.
- 3/10 . . Interfaces, programming languages or software development kits, e.g. for simulating neural networks
- 3/105 . . . {Shells for specifying net layout}
- 3/12 . . using genetic models
- 3/123 . . DNA computing
- 3/126 . . Evolutionary algorithms, e.g. genetic algorithms or genetic programming
- 5/00 Computing arrangements using knowledge-based models**
- 5/01 . Dynamic search techniques; Heuristics; Dynamic trees; Branch-and-bound
- 5/013 . . {Automatic theorem proving}
- 5/02 . Knowledge representation; Symbolic representation
- 5/022 . . Knowledge engineering; Knowledge acquisition
- 5/025 . . . Extracting rules from data
- 5/027 . . {Frames}
- 5/04 . Inference or reasoning models
- 5/041 . . {Abduction}
- 5/042 . . {Backward inferencing}
- 5/043 . . Distributed expert systems; Blackboards
- 5/045 . . Explanation of inference; Explainable artificial intelligence [XAI]; Interpretable artificial intelligence
- 5/046 . . Forward inferencing; Production systems
- 5/047 . . . Pattern matching networks; Rete networks
- 5/048 . . Fuzzy inferencing
- 7/00 Computing arrangements based on specific mathematical models**
- 7/01 . Probabilistic graphical models, e.g. probabilistic networks
- 7/02 . using fuzzy logic (computing arrangements based on biological models [G06N 3/00](#); computing arrangements using knowledge-based models [G06N 5/00](#))
- 7/023 . . {Learning or tuning the parameters of a fuzzy system}
- 7/026 . . {Development tools for entering the parameters of a fuzzy system}
- 7/04 . . Physical realisation
- 7/043 . . . {Analogue or partially analogue implementation}
- 7/046 . . . {Implementation by means of a neural network (neural networks using fuzzy logic [G06N 3/043](#))}
- 7/06 . . Simulation on general purpose computers
- 7/08 . . using chaos models or non-linear system models
- 10/00 Quantum computing, i.e. information processing based on quantum-mechanical phenomena**
- WARNING**
- Group [G06N 10/00](#) is impacted by reclassification into groups [G06N 10/20](#), [G06N 10/40](#), [G06N 10/60](#), [G06N 10/70](#) and [G06N 10/80](#).
- All groups listed in this Warning should be considered in order to perform a complete search.
- 10/20 . Models of quantum computing, e.g. quantum circuits or universal quantum computers
- WARNING**
- Group [G06N 10/20](#) is incomplete pending reclassification of documents from group [G06N 10/00](#).
- Groups [G06N 10/00](#) and [G06N 10/20](#) should be considered in order to perform a complete search.
- 10/40 . Physical realisations or architectures of quantum processors or components for manipulating qubits, e.g. qubit coupling or qubit control
- WARNING**
- Group [G06N 10/40](#) is incomplete pending reclassification of documents from group [G06N 10/00](#).
- Groups [G06N 10/00](#) and [G06N 10/40](#) should be considered in order to perform a complete search.
- 10/60 . Quantum algorithms, e.g. based on quantum optimisation, quantum Fourier or Hadamard transforms
- WARNING**
- Group [G06N 10/60](#) is incomplete pending reclassification of documents from group [G06N 10/00](#).
- Groups [G06N 10/00](#) and [G06N 10/60](#) should be considered in order to perform a complete search.
- 10/70 . Quantum error correction, detection or prevention, e.g. surface codes or magic state distillation
- WARNING**
- Group [G06N 10/70](#) is incomplete pending reclassification of documents from group [G06N 10/00](#).
- Groups [G06N 10/00](#) and [G06N 10/70](#) should be considered in order to perform a complete search.

G06N

- 10/80 . Quantum programming, e.g. interfaces, languages or software-development kits for creating or handling programs capable of running on quantum computers; Platforms for simulating or accessing quantum computers, e.g. cloud-based quantum computing

WARNING

Group [G06N 10/80](#) is incomplete pending reclassification of documents from group [G06N 10/00](#).

Groups [G06N 10/00](#) and [G06N 10/80](#) should be considered in order to perform a complete search.

20/00 Machine learning

- 20/10 . using kernel methods, e.g. support vector machines [SVM]
- 20/20 . Ensemble learning

99/00 Subject matter not provided for in other groups of this subclass

- 99/007 . {Molecular computers, i.e. using inorganic molecules (using biomolecules [G06N 3/002](#))}