

**ECLA****EUROPEAN CLASSIFICATION****G06N****COMPUTER SYSTEMS BASED ON SPECIFIC COMPUTATIONAL MODELS** [N0004]**G06N3/00****Computer systems based on biological models** (analogue computers simulating functional aspects of living beings [G06G7/60](#)) [N0004]**G06N3/00B**

- [N: Biomolecular computers, i.e. using biomolecules, proteins, cells (using DNA [G06N3/12D](#); using neurons [G06N3/06B](#))] [N0004]

**G06N3/00L**

- [N: Artificial life, i.e. computers simulating life] [N0004]

**G06N3/00L1**

- • [N: based on simulated virtual individual or collective life forms, e.g. single "avatar", social simulations, virtual worlds (computer games [A63F13/00](#); medical simulations [G06F19/00](#); information retrieval [G06F17/30W3](#); image processing [G06T](#); telecommunication protocols [H04L29/06C4](#))] [N1010]

**G06N3/00L3**

- • [N: based on physical entities controlled by simulated intelligence so as to replicate intelligent life forms, e.g. robots replicating pets or humans in their appearance or behavior (toys or dolls [A63H3/00](#); industrial robot control [G05B19/00](#), [B25J9/00](#); artificial neural networks [G06N3/00](#); rule based artificial intelligence [G06N5/00](#))] [N1010]

**G06N3/02**

- using neural network models (for adaptive control [G05B13/00](#); for image pattern matching [G06K9/00](#); for image data processing [G06T1/20](#); for phonetic pattern matching [G10L15/16](#))[N0004] [C0606]

**G06N3/04**

- • Architectures, e.g. interconnection topology [N0004]

**G06N3/04A**

- • • [N: Adaptive Resonance Theory [ART] networks] [N0004]

**G06N3/04C**

- • • [N: using chaos or fractal principles] [N0004]

**G06N3/04E**

- • • [N: in combination with an expert system] [N0004]

**G06N3/04F**

- • • [N: in combination with fuzzy logic] [N0004]

**G06N3/04H**

- • • [N: Feedback networks, e.g. hopfield nets, associative networks] [N0004]

**G06N3/04M**

- • • [N: using a combination of multiple neural nets] [N0004]

**G06N3/04N**

- • • [N: Neocognitrons] [N0004]

**G06N3/04P**

- • • [N: using probabilistic elements, e.g. p-rams, stochastic processors] [N0004]

**G06N3/04S**

- • • [N: Non-linear activation functions, e.g. sigmoids, thresholds] [N0004]

**G06N3/04T**

- • • [N: Temporal neural nets, e.g. delay elements, oscillating neurons, pulsed inputs] [N0004]

**G06N3/06**

- • Physical realisation, i.e. hardware implementation of neural networks, neurons or parts of neurons [N0004]

**G06N3/06B**

- • • [N: using biological neurons, e.g. biological neurons connected to an integrated circuit] [N0004]

**G06N3/063**

- • • using electronic means [N0004]

**G06N3/063A**

- • • • [N: using analogue means] [N0004]

**G06N3/067**

- • • using optical means [N0004]

**G06N3/067E**

- • • • [N: using electro-optical, acousto-optical or opto-electronic means] [N0004]

**G06N3/08**

- • Learning methods [N0004]

- G06N3/08A . . . [N: modifying the architecture, e.g. adding or deleting nodes or connections, pruning] [N0004]
- G06N3/08B . . . [N: Back-propagation] [N0004]
- G06N3/08E . . . [N: using evolutionary programming, e.g. genetic algorithms] [N0004]
- G06N3/08N . . . [N: Non-supervised learning, e.g. competitive learning] [N0004]
- G06N3/10 . . Simulation on general purpose computers [N0004]
- G06N3/10S . . . [N: Shells for specifying net layout] [N0004]
- G06N3/12 . using genetic models [N0004]
- G06N3/12D . . [N: DNA computers, i.e. information processing using biological DNA] [N0004]
- G06N3/12G . . [N: Genetic algorithms, i.e. information processing using digital simulations of the genetic system] [N0004]

### **G06N5/00 Computer systems utilising knowledge based models [N0004]**

- G06N5/00H . [N: Dynamic search techniques, heuristics, branch-and-bound ([G06F9/44L3B](#), [G06N5/04F](#) take precedence; for optimisation [G06Q10/00B](#); for game playing [G06F19/00B](#))] [N0004] [C0506]
- G06N5/00H2 . . [N: Automatic theorem proving] [N0004]
- G06N5/02 . Knowledge representation [N: ([G06N5/04](#) takes precedence)] [N0004]
- G06N5/02K . . [N: Knowledge engineering, knowledge acquisition] [N0004]
- G06N5/02K2 . . . [N: Extracting rules from data (learning in general [G06F15/18](#))] [N0004]
- G06N5/02R . . [N: Frames] [N9409]
- G06N5/04 . Inference methods or devices [N0004]
- G06N5/04A . . [N: Abduction] [N0004]
- G06N5/04B . . [N: Backward inferencing] [N0004]
- G06N5/04D . . [N: Distributed expert systems, blackboards] [N0004]
- G06N5/04E . . [N: Explanation of inference steps] [N0004]
- G06N5/04F . . [N: Forward inferencing, production systems] [N0004]
- G06N5/04F1 . . . [N: Pattern matching networks, RETE] [N0004]
- G06N5/04G . . [N: Fuzzy inferencing] [N0004]

### **G06N7/00 Computer systems based on specific mathematical models [N0004]**

- G06N7/00P . [N: Probabilistic networks] [N0004]
- G06N7/02 . using fuzzy logic ([G06N3/00](#), [G06N5/00](#) take precedence; for adaptive control [G05B13/00](#)) [N0004]
- G06N7/02P . . [N: Learning or tuning the parameters of a fuzzy system] [N0004]
- G06N7/02T . . [N: Development tools for entering the parameters of a fuzzy system] [N0004]
- G06N7/04 . . Physical realisation [N0004]
- G06N7/04A . . . [N: Analogue or partially analogue implementation] [N0004]
- G06N7/04N . . . [N: Implementation by means of a neural network (neural networks using fuzzy logic [G06N3/04F](#))] [N0004]

- G06N7/06 . . . Simulation on general purpose computers [N0004]
- G06N7/08 . . . using chaos models or non-linear system models [N0004]
- G06N99/00** **Subject matter not provided for in other groups of this subclass [N1002]**
- G06N99/00K . [N: Quantum computers, i.e. information processing by using quantum superposition, coherence, decoherence, entanglement, nonlocality, teleportation] [N1002]
- G06N99/00L . [N: Learning machines, i.e. computer in which a programme is changed according to experience gained by the machine itself during a complete run (neural networks [G06N3/02](#); knowledge based models [G06N5](#); fuzzy logic systems [G06N7/02](#); adaptive control systems [G05B13/00](#))] [N1002]
- G06N99/00M . [N: Molecular computers, i.e. using inorganic molecules (using biomolecules [G06N3/00B](#))] [N1002]