

**CPC****COOPERATIVE PATENT CLASSIFICATION****G06N****COMPUTER SYSTEMS BASED ON SPECIFIC COMPUTATIONAL MODELS****G06N 3/00**

**Computer systems based on biological models** (analogue computers simulating functional aspects of living beings [G06G 7/60](#))

## G06N 3/002

- {Biomolecular computers, i.e. using biomolecules, proteins, cells (using DNA [G06N 3/123](#); using neurons [G06N 3/061](#))}

## G06N 3/004

- {Artificial life, i.e. computers simulating life}

## G06N 3/006

- • {based on simulated virtual individual or collective life forms, e.g. single "avatar", social simulations, virtual worlds (computer games [A63F 13/00](#); medical simulations [G06F 19/00](#); information retrieval [G06F 17/30873](#); image processing [G06T](#); telecommunication protocols [H04L 29/06034](#))}

## G06N 3/008

- • {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 [A63H 3/00](#); industrial robot control [G05B 19/00](#), [B25J 9/00](#); artificial neural networks [G06N 3/00](#); rule based artificial intelligence [G06N 5/00](#))}

## G06N 3/02

- using neural network models (for adaptive control [G05B 13/00](#); for image pattern matching [G06K 9/00](#); for image data processing [G06T 1/20](#); for phonetic pattern matching [G10L 15/16](#))

## G06N 3/04

- • Architectures, e.g. interconnection topology

## G06N 3/0409

- • • {Adaptive Resonance Theory [ART] networks}

## G06N 3/0418

- • • {using chaos or fractal principles}

## G06N 3/0427

- • • {in combination with an expert system}

## G06N 3/0436

- • • {in combination with fuzzy logic}

## G06N 3/0445

- • • {Feedback networks, e.g. hopfield nets, associative networks}

## G06N 3/0454

- • • {using a combination of multiple neural nets}

## G06N 3/0463

- • • {Neocognitrons}

## G06N 3/0472

- • • {using probabilistic elements, e.g. p-rams, stochastic processors}

## G06N 3/0481

- • • {Non-linear activation functions, e.g. sigmoids, thresholds}

## G06N 3/049

- • • {Temporal neural nets, e.g. delay elements, oscillating neurons, pulsed inputs}

## G06N 3/06

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

## G06N 3/061

- • • {using biological neurons, e.g. biological neurons connected to an integrated circuit}

## G06N 3/063

- • • using electronic means

## G06N 3/0635

- • • • {using analogue means}

## G06N 3/067

- • • using optical means

## G06N 3/0675

- • • • {using electro-optical, acousto-optical or opto-electronic means}

## G06N 3/08

- • Learning methods

- G06N 3/082 . . . {modifying the architecture, e.g. adding or deleting nodes or connections, pruning}
- G06N 3/084 . . . {Back-propagation}
- G06N 3/086 . . . {using evolutionary programming, e.g. genetic algorithms}
- G06N 3/088 . . . {Non-supervised learning, e.g. competitive learning}
- G06N 3/10 . . . Simulation on general purpose computers
- G06N 3/105 . . . {Shells for specifying net layout}
- G06N 3/12 . . . using genetic models
- G06N 3/123 . . . {DNA computers, i.e. information processing using biological DNA}
- G06N 3/126 . . . {Genetic algorithms, i.e. information processing using digital simulations of the genetic system}

**G06N 5/00****Computer systems utilising knowledge based models**

- G06N 5/003 . {Dynamic search techniques, heuristics, branch-and-bound ([G06N 5/046](#) take precedence; for optimisation [G06Q 10/04](#))}
- G06N 5/006 . . {Automatic theorem proving}
- G06N 5/02 . Knowledge representation {([G06N 5/04](#) takes precedence)}
- G06N 5/022 . . {Knowledge engineering, knowledge acquisition}
- G06N 5/025 . . . {Extracting rules from data (learning in general [G06F 15/18](#))}
- G06N 5/027 . . {Frames}
- G06N 5/04 . Inference methods or devices
- G06N 5/041 . . {Abduction}
- G06N 5/042 . . {Backward inferencing}
- G06N 5/043 . . {Distributed expert systems, blackboards}
- G06N 5/045 . . {Explanation of inference steps}
- G06N 5/046 . . {Forward inferencing, production systems}
- G06N 5/047 . . . {Pattern matching networks, RETE}
- G06N 5/048 . . {Fuzzy inferencing}

**G06N 7/00****Computer systems based on specific mathematical models**

- G06N 7/005 . {Probabilistic networks}
- G06N 7/02 . using fuzzy logic ([G06N 3/00](#), [G06N 5/00](#) take precedence; for adaptive control [G05B 13/00](#))
- G06N 7/023 . . {Learning or tuning the parameters of a fuzzy system}
- G06N 7/026 . . {Development tools for entering the parameters of a fuzzy system}
- G06N 7/04 . . Physical realisation
- G06N 7/043 . . . {Analogue or partially analogue implementation}
- G06N 7/046 . . . {Implementation by means of a neural network (neural networks using fuzzy logic [G06N 3/0436](#))}
- G06N 7/06 . . Simulation on general purpose computers
- G06N 7/08 . using chaos models or non-linear system models

**G06N 99/00****Subject matter not provided for in other groups of this subclass**

- G06N 99/002
  - {Quantum computers, i.e. information processing by using quantum superposition, coherence, decoherence, entanglement, nonlocality, teleportation}
- G06N 99/005
  - {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 [G06N 3/02](#); knowledge based models [G06N 5/00](#); fuzzy logic systems [G06N 7/02](#); adaptive control systems [G05B 13/00](#))}
- G06N 99/007
  - {Molecular computers, i.e. using inorganic molecules (using biomolecules [G06N 3/002](#))}