

**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](#))}