SECTION G — PHYSICS

G06   COMPUTING; CALCULATING OR COUNTING

G06N   COMPUTING ARRANGEMENTS BASED ON SPECIFIC COMPUTATIONAL MODELS [7]

3/00   Computing arrangements based on biological models [7, 2006.01, 2023.01]

3/004 • Artificial life, i.e. computing arrangements simulating life **[2023.01]**

3/006 • • based on simulated virtual individual or collective life forms, e.g. social simulations or particle swarm optimisation [PSO] **[2023.01]**

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 **[2023.01]**

3/02 • Neural networks **[7, 2006.01]**

3/04 • • Architecture, e.g. interconnection topology **[7, 2006.01, 2023.01]**

3/042 • • • Knowledge-based neural networks; Logical representations of neural networks **[2023.01]**

3/043 • • • based on fuzzy logic, fuzzy membership or fuzzy inference, e.g. adaptive neuro-fuzzy inference systems [ANFIS] **[2023.01]**

3/044 • • • Recurrent networks, e.g. Hopfield networks **[2023.01]**

3/0442 • • • • characterised by memory or gating, e.g. long short-term memory [LSTM] or gated recurrent units [GRU] **[2023.01]**

3/045 • • • Combinations of networks **[2023.01]**

3/0455 • • • • Auto-encoder networks; Encoder-decoder networks **[2023.01]**

3/0464 • • • Convolutional networks [CNN, ConvNet] **[2023.01]**

3/047 • • • Probabilistic or stochastic networks **[2023.01]**

3/0475 • • • Generative networks **[2023.01]**

3/048 • • • Activation functions **[2023.01]**

3/049 • • • Temporal neural networks, e.g. delay elements, oscillating neurons or pulsed inputs **[2023.01]**

3/0495 • • • Quantised networks; Sparse networks; Compressed networks **[2023.01]**

3/0499 • • • Feedforward networks **[2023.01]**

3/06 • • Physical realisation, i.e. hardware implementation of neural networks, neurons or parts of neurons **[7, 2006.01]**

3/063 • • • using electronic means **[7, 2006.01, 2023.01]**

3/065 • • • • Analogue means **[2023.01]**

3/067 • • • using optical means **[7, 2006.01]**

3/08 • • Learning methods **[7, 2006.01, 2023.01]**

3/082 • • • modifying the architecture, e.g. adding, deleting or silencing nodes or connections **[2023.01]**

3/084 • • • Backpropagation, e.g. using gradient descent **[2023.01]**

3/086 • • • using evolutionary algorithms, e.g. genetic algorithms or genetic programming **[2023.01]**

3/088 • • • Non-supervised learning, e.g. competitive learning **[2023.01]**

3/0895 • • • • Weakly supervised learning, e.g. semi-supervised or self-supervised learning **[2023.01]**

3/09 • • • Supervised learning **[2023.01]**

3/091 • • • Active learning **[2023.01]**

3/092 • • • Reinforcement learning **[2023.01]**

3/094 • • • Adversarial learning **[2023.01]**

3/096 • • • Transfer learning **[2023.01]**

3/098 • • • Distributed learning, e.g. federated learning **[2023.01]**

3/0985 • • • Hyperparameter optimisation; Meta-learning; Learning-to-learn **[2023.01]**

3/10 • • Interfaces, programming languages or software development kits, e.g. for simulating neural networks **[7, 2006.01]**

3/12 • using genetic models **[7, 2006.01, 2023.01]**

3/123 • • DNA computing **[2023.01]**

3/126 • • Evolutionary algorithms, e.g. genetic algorithms or genetic programming **[2023.01]**

5/00   Computing arrangements using knowledge-based models [7, 2006.01, 2023.01]

5/01 • Dynamic search techniques; Heuristics; Dynamic trees; Branch-and-bound **[2023.01]**

5/02 • Knowledge representation; Symbolic representation **[7, 2006.01, 2023.01]**

5/022 • • Knowledge engineering; Knowledge acquisition **[2023.01]**

5/025 • • • Extracting rules from data **[2023.01]**

5/04 • Inference or reasoning models **[7, 2006.01, 2023.01]**

5/043 • • Distributed expert systems; Blackboards **[2023.01]**

5/045 • • Explanation of inference; Explainable artificial intelligence [XAI]; Interpretable artificial intelligence **[2023.01]**

5/046 • • Forward inferencing; Production systems **[2023.01]**

5/047 • • • Pattern matching networks; Rete networks **[2023.01]**

5/048 • • Fuzzy inferencing **[2023.01]**

7/00   Computing arrangements based on specific mathematical models [7, 2006.01, 2023.01]

7/01 • Probabilistic graphical models, e.g. probabilistic networks **[2023.01]**

7/02 • using fuzzy logic (computing arrangements based on biological models G06N 3/00; computing arrangements using knowledge-based models G06N 5/00) **[7, 2006.01]**

7/04 • • Physical realisation **[7, 2006.01]**

7/06 • • Simulation on general purpose computers **[7, 2006.01]**

7/08 • using chaos models or non-linear system models **[7, 2006.01]**

10/00 **Quantum computing, i.e. information processing based on quantum-mechanical phenomena [2019.01, 2022.01]**

10/20 • Models of quantum computing, e.g. quantum circuits or universal quantum computers **[2022.01]**

10/40 • Physical realisations or architectures of quantum processors or components for manipulating qubits, e.g. qubit coupling or qubit control **[2022.01]**

10/60 • Quantum algorithms, e.g. based on quantum optimisation, or quantum Fourier or Hadamard transforms **[2022.01]**

10/70 • Quantum error correction, detection or prevention, e.g. surface codes or magic state distillation **[2022.01]**

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 **[2022.01]**

20/00 **Machine learning [2019.01]**

20/10 • using kernel methods, e.g. support vector machines [SVM] **[2019.01]**

20/20 • Ensemble learning **[2019.01]**

99/00 **Subject matter not provided for in other groups of this subclass [2010.01, 2019.01]**