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2.13 Inference Mechanism; 2.13.1 Mamdani Fuzzy Inference; 2.13.2 Sugeno Fuzzy Inference; 2.13.3 Tsukamoto Fuzzy Inference; 2.14 Worked Examples; 2.15 MATLAB® Programs; References; 3 Fuzzy Systems and Applications; 3.1 Introduction; 3.2 Fuzzy System; 3.3 Fuzzy Modelling; 3.3.1 Structure Identification; 3.3.2 Parameter Identification; 3.3.3 Construction of Parameterized Membership Functions; 3.4 Fuzzy Control; 3.4.1 Fuzzification; 3.4.2 Inference Mechanism; 3.4.3 Rule Base; 3.4.4 Defuzzification; 3.5 Design of Fuzzy Controller; 3.5.1 Input/Output Selection; 3.5.2 Choice of Membership Functions; 3.5.3 Creation of Rule Base; 3.5.4 Types of Fuzzy Controller; 3.6 Modular Fuzzy Controller; 3.7 MATLAB® Programs; References; 4 Neural Networks; 4.1 Introduction; 4.2 Artificial Neuron Model; 4.3 Activation Functions; 4.4 Network Architecture; 4.4.1 Feedforward Networks; 4.5 Learning in Neural Networks; 4.5.1 Supervised Learning; 4.5.2 Unsupervised Learning; 4.6 Recurrent Neural Networks; 4.6.1 Elman Networks; 4.6.2 Jordan Networks; 4.6.3 Hopfield Networks; 4.7 MATLAB® Programs; References; 5 Neural Systems and Applications; 5.1 Introduction; 5.2 System Identification and Control; 5.2.1 System Description; 5.2.2 System Identification; 5.2.3 System Control; 5.3 Neural Networks for Control; 5.3.1 System Identification for Control Design; 5.3.2 Neural Networks for Control Design; 5.4 MATLAB® Programs; References; 6 Evolutionary Computing; 6.1 Introduction; 6.2 Evolutionary Computing; 6.3 Terminologies of Evolutionary Computing; 6.3.1 Chromosome Representation; 6.3.2 Encoding Schemes; 6.3.3 Population; 6.3.4 Evaluation (or Fitness) Functions; 6.3.5 Fitness Scaling

Sommario/riassunto

Computational Intelligence: Synergies of Fuzzy Logic, Neural Networks and Evolutionary Computing presents an introduction to some of the cutting edge technological paradigms under the umbrella of computational intelligence. Computational intelligence schemes are investigated with the development of a suitable framework for fuzzy logic, neural networks and evolutionary computing, neuro-fuzzy systems, evolutionary-fuzzy systems and evolutionary neural systems. Applications to linear and non-linear systems are discussed with examples. Key features: Covers all the aspect
