METADATA

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Abstract

Computational intelligence was initially defined as a set of three technologies comprising neural networks, fuzzy systems, and evolutionary computation. Later, additional technologies were proposed, e.g., decision support systems, machine learning, data mining, and various synergies between them. The broader field of Computational Intelligence focuses on the analysis and design of models for learning and/or generalization based on numerical data. Note that the learning process also raises the issue of information representation. Recent publications place Computational Intelligence at the core of cutting-edge technologies related to the processing of huge amounts of data, human-computer interaction, the Internet of Things, etc. [1]. Furthermore (ibid.), the need for a holistic view of the teaching of Computational Intelligence (rather than the fragmented views proposed by individual technologies) is supported, with an emphasis not only on practical applications but also on basic knowledge. The purpose of this book is to introduce readers to the scientific field of Computational Intelligence with a view to applications in emerging technologies. The presentation is structured around models and algorithms. The appendices of this book provide software for implementing algorithms in MATLAB, as well as examples of practical applications. Extensive and audiovisual comments by the authors aim to motivate further study, starting from the selected bibliography provided at the end of each chapter. Extended Computational Intelligence is one part of the holistic approach proposed here. The other part concerns the integration of analysis and design in Computational Intelligence through a unified representation of information based on mathematical lattice theory. [1] M. M. Polycarpou, “Computational intelligence in the undergraduate curriculum”, IEEE Computational Intelligence Magazine, vol. 8, no. 2, p. 3, May 2013.

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