Modular neural networks and type-2 fuzzy systems for pattern recognition

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Abstrak

This book describes hybrid intelligent systems using type-2 fuzzy logic and modular neural networks for pattern recognition applications. Hybrid intelligent systems combine several intelligent computing paradigms, including fuzzy logic, neural networks, and bio-inspired optimization algorithms, which can be used to produce powerful pattern recognition systems. Type-2 fuzzy logic is an extension of traditional type-1 fuzzy logic that enables managing higher levels of uncertainty in complex real world problems, which are of particular importance in the area of pattern recognition. The book is organized in three main parts, each containing a group of chapters built around a similar subject. The first part consists of chapters with the main theme of theory and design algorithms, which are basically chapters that propose new models and concepts, which are the basis for achieving intelligent pattern recognition. The second part contains chapters with the main theme of using type-2 fuzzy models and modular neural networks with the aim of designing intelligent systems for complex pattern recognition problems, including iris, ear, face and voice recognition. The third part contains chapters with the theme of evolutionary optimization of type-2 fuzzy systems and modular neural networks in the area of intelligent pattern recognition, which includes the application of genetic algorithms for obtaining optimal type-2 fuzzy integration systems and ideal neural network architectures for solving problems in this area.