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Nota di contenuto	Intro -- Preface -- Contents -- 1 Introduction to Soft Computing Applied in Medicine -- References -- 2 Theory of Soft Computing and Medical Terms -- 2.1 Hybrid Systems -- 2.1.1 Artificial Neural Networks -- 2.1.2 Type-1 Fuzzy Systems -- 2.1.3 Type-2 Fuzzy Logic -- 2.1.4 Optimization -- 2.1.5 CSO -- 2.1.6 CSA -- 2.1.7 FPA -- 2.1.8 BSA -- 2.2 Blood Pressure -- 2.2.1 Hypertension -- 2.2.2 Heart Rate -- 2.2.3 Nocturnal Blood Pressure Profile -- 2.2.4 Ambulatory Blood Pressure Monitoring -- 2.2.5 Framingham Heart Study -- 2.2.6 Cardiovascular Risk -- References -- 3 Proposed Model to Obtain the Medical Diagnosis -- 3.1 Neuro-Fuzzy Hybrid Model -- 3.2 IT2FS for Classification of Heart Rate Level -- 3.3 IT2FS for Classification of Nocturnal Bloor Pressure Profile -- 4 Study Cases to Test the Optimization Performed in the Hybrid Model -- 4.1 Optimization of the Fuzzy System to Provide the Correct Classification

Sommario/riassunto

This book describes the utilization of different soft computing techniques and their optimization for providing an accurate and efficient medical diagnosis. The proposed method provides a precise and timely diagnosis of the risk that a person has to develop a particular disease, but it can be adaptable to provide the diagnosis of different diseases. This book reflects the experimentation that was carried out, based on the different optimizations using bio-inspired algorithms (such as bird swarm algorithm, flower pollination algorithms, and others). In particular, the optimizations were carried out to design the fuzzy classifiers of the nocturnal blood pressure profile and heart rate level. In addition, to obtain the architecture that provides the best result, the neurons and the number of neurons per layers of the artificial neural networks used in the model are optimized. Furthermore, different tests were carried out with the complete optimized model. Another work that is presented in this book is the dynamic parameter adaptation of the bird swarm algorithm using fuzzy inference systems, with the aim of improving its performance. For this, different experiments are carried out, where mathematical functions and a monolithic neural network are optimized to compare the results obtained with the original algorithm. The book will be of interest for graduate students of engineering and medicine, as well as researchers and professors aiming at proposing and developing new intelligent models for medical diagnosis. In addition, it also will be of interest for people working on metaheuristic algorithms and their applications on medicine.