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Oscar Castillo · Patricia Melin
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Fuzzy Logic Augmentation of Nature-Inspired Optimization Metaheuristics

Theory and Applications

Springer

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Preface

We describe in this book, recent advances on fuzzy logic augmentation of nature-inspired optimization metaheuristics and their application in areas, such as intelligent control and robotics, pattern recognition, time series prediction, and optimization of complex problems. The book is organized into two main parts, which contain a group of papers around a similar subject. Part I consists of papers with the main theme of theoretical aspects of fuzzy logic augmentation of nature-inspired optimization metaheuristics, which basically consists of papers that propose new optimization algorithms enhanced using fuzzy systems. Part II contains papers with the main theme of application of optimization algorithms, which are basically papers using nature-inspired techniques to achieve optimization of complex optimization problems in diverse areas of application.

In the part of theoretical aspects of fuzzy logic augmentation of nature-inspired optimization metaheuristics, there are seven chapters that describe different contributions that propose new models and concepts, which can be the considered as the basis for enhancing nature-inspired algorithms with fuzzy logic. The aim of using fuzzy logic is to provide dynamic adaptation capabilities to the optimization algorithms, and this is illustrated with the cases of the bat algorithm, cuckoo search, and other methods. In the part of applications of fuzzy nature-inspired algorithms there are five chapters that describe different contributions on the application of the nature-inspired algorithms to solve complex optimization problems. The nature-inspired methods include variations of ant colony optimization, particle swarm optimization, the bat algorithm, as well as new nature inspired paradigms.

In conclusion, the edited book comprises papers on diverse aspects of fuzzy logic augmentation of nature-inspired optimization metaheuristics and their application in areas, such as intelligent control and robotics, pattern recognition, time series prediction, and optimization of complex problems. There are theoretical aspects as well as application papers.

Mexico, May 2014

Oscar Castillo
Patricia Melin

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