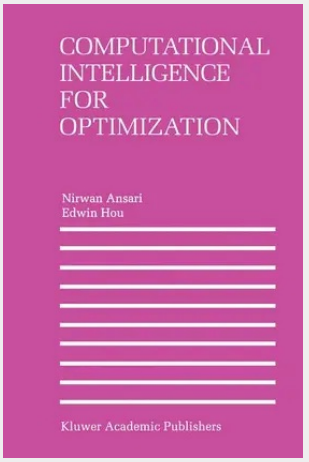
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Computational Intelligence for Optimization



The field of optimization is interdisciplinary in nature, and has been making a significant impact on many disciplines. As a result, it is an indispensable tool for many practitioners in various fields. Conventional optimization techniques have been well established and widely published in many excellent textbooks. However, there are new techniques, such as neural networks, simulated anneal ing, stochastic machines, mean field theory, and genetic algorithms, which have been proven to be effective in solving global optimization problems. This book is intended to provide a technical description on the state-of-the-art development in advanced optimization techniques, specifically heuristic search, neural networks, simulated annealing, stochastic machines, mean field theory, and genetic algorithms, with emphasis on mathematical theory, implementa tion, and practical applications. The text is suitable for a first-year graduate course in electrical and computer engineering, computer science, and opera tional research programs. It may also be used as a reference for practicing engineers, scientists, operational researchers, and other specialists. This book is an outgrowth of a couple of special topic courses that we have been teaching for the past five years. In addition, it includes many results from our inter disciplinary research on the topic. The aforementioned advanced optimization techniques have received increasing attention over the last decade, but relatively few books have been produced.

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