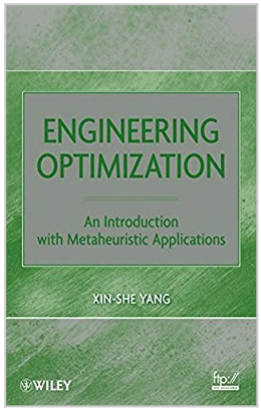

Engineering Optimization: An Introduction with Metaheuristic Applications

By Xin-She Yang

Engineering Optimization: An Introduction with Metaheuristic Applications
By Xin-She Yang

An accessible introduction to metaheuristics and optimization, featuring powerful and modern algorithms for application across engineering and the sciences

From engineering and computer science to economics and management science, optimization is a core component for problem solving. Highlighting the latest developments that have evolved in recent years, *Engineering Optimization: An Introduction with Metaheuristic Applications* outlines popular metaheuristic algorithms and equips readers with the skills needed to apply these techniques to their own optimization problems. With insightful examples from various fields of study, the author highlights key concepts and techniques for the successful application of commonly-used metaheuristc algorithms, including simulated annealing, particle swarm optimization, harmony search, and genetic algorithms.

The author introduces all major metaheuristic algorithms and their applications in optimization through a presentation that is organized into three succinct parts:

- ***Foundations of Optimization and Algorithms*** provides a brief introduction to the underlying nature of optimization and the common approaches to optimization problems, random number generation, the Monte Carlo method, and the Markov chain Monte Carlo method
- ***Metaheuristic Algorithms*** presents common metaheuristic algorithms in detail, including genetic algorithms, simulated annealing, ant algorithms, bee algorithms, particle swarm optimization, firefly algorithms, and harmony search
- ***Applications*** outlines a wide range of applications that use metaheuristic algorithms to solve challenging optimization problems with detailed implementation while also introducing various modifications used for multi-objective optimization

Throughout the book, the author presents worked-out examples and real-world applications that illustrate the modern relevance of the topic. A detailed appendix features important and popular algorithms using MATLAB® and Octave software packages, and a related FTP site houses MATLAB code and programs for easy implementation of the discussed techniques. In addition, references to

the current literature enable readers to investigate individual algorithms and methods in greater detail.

Engineering Optimization: An Introduction with Metaheuristic Applications is an excellent book for courses on optimization and computer simulation at the upper-undergraduate and graduate levels. It is also a valuable reference for researchers and practitioners working in the fields of mathematics, engineering, computer science, operations research, and management science who use metaheuristic algorithms to solve problems in their everyday work.

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Editorial Review

About the Author
XIN-SHE YANG, PhD, is Senior Research Fellow in the Department of Engineering at Cambridge University (United Kingdom). The Editor-in-Chief of *International Journal of Mathematical Modeling and Numerical Optimization (IJMMNO)*, Dr. Yang has published more than sixty journal articles in his areas of research interest, which include computational mathematics, metaheuristic algorithms, numerical analysis, and engineering optimization.

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