Optimization Techniques and Applications with Examples
Xin-She Yang

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A guide to modern optimization applications and techniques in newly emerging areas spanning optimization, data science, machine intelligence, engineering, and computer sciences

Optimization Techniques and Applications with Examples introduces the fundamentals of all the commonly used techniques in optimization that encompass the breadth and diversity of the methods (traditional and new) and algorithms. The author—a noted expert in the field—covers a wide range of topics including mathematical foundations, optimization formulation, optimality conditions, algorithmic complexity, linear programming, convex optimization, and integer programming. In addition, the book discusses artificial neural network, clustering and classifications, constraint-handling, queueing theory, support vector machine and multi-objective optimization, evolutionary computation, nature-inspired algorithms and many other topics.

Designed as a practical resource, all topics are explained in detail with step-by-step examples to show how each method works. The book’s exercises test the acquired knowledge that can be potentially applied to real problem solving. By taking an informal approach to the subject, the author helps readers to rapidly acquire the basic knowledge in optimization, operational research, and applied data mining. This important resource:

• Offers an accessible and state-of-the-art introduction to the main optimization techniques

• Contains both traditional optimization techniques and the most current algorithms and swarm intelligence-based techniques
• Presents a balance of theory, algorithms, and implementation

• Includes more than 100 worked examples with step-by-step explanations

Written for upper undergraduates and graduates in a standard course on optimization, operations research and data mining, *Optimization Techniques and Applications with Examples* is a highly accessible guide to understanding the fundamentals of all the commonly used techniques in optimization.

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**ABOUT THE AUTHOR**

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