DATA

Optimization Algorithms

Alaa Khamis

Every time you call for a rideshare, order food delivery, book a flight, or schedule a hospital appointment, an algorithm works behind the scenes to find the optimal result. Blending modern AI methods with classical search and optimization techniques can deliver incredible results, especially for the messy problems you encounter in the real world. This book shows you how.

Optimization Algorithms explains in clear language how optimization algorithms work and what you can do with them. This engaging book goes beyond toy examples, presenting detailed scenarios that use actual industry data and cutting-edge AI techniques. You will learn how to apply modern optimization algorithms to real-world problems like pricing products, matching supply with demand, balancing assembly lines, tuning parameters, coordinating mobile networks, and cracking smart mobility challenges.

What's Inside

- Graph search algorithms
- Metaheuristic algorithms
- Machine learning methods
- State-of-the-art Python libraries for optimization
- Efficient trade-offs between search space exploration and exploitation

Requires intermediate Python and machine learning skills.

Dr. Alaa Khamis is an AI and smart mobility technical leader at General Motors and a lecturer at the University of Toronto.

The technical editor on this book was Frances Buontempo.

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https://www.manning.com/freebook

"Elegantly covers modern optimization algorithms in depth and breadth. A great resource."
—Ajit Jaokar, University of Oxford

"A treasure trove. Perfect for anyone looking to navigate the intricate world of optimization in real-world scenarios."
—Sergei Kalinin
University of Tennessee

"An exceptional book on the most prominent optimization algorithms."
—Maxim Volgin
KLM Royal Dutch Airlines

"This little gem introduces the reader to the algorithms and how you should apply them to real-world problems. A must-read!"
—Marcello La Rocca, Author of *Grokking Data Structures* and *Advanced Algorithms and Data Structures*

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