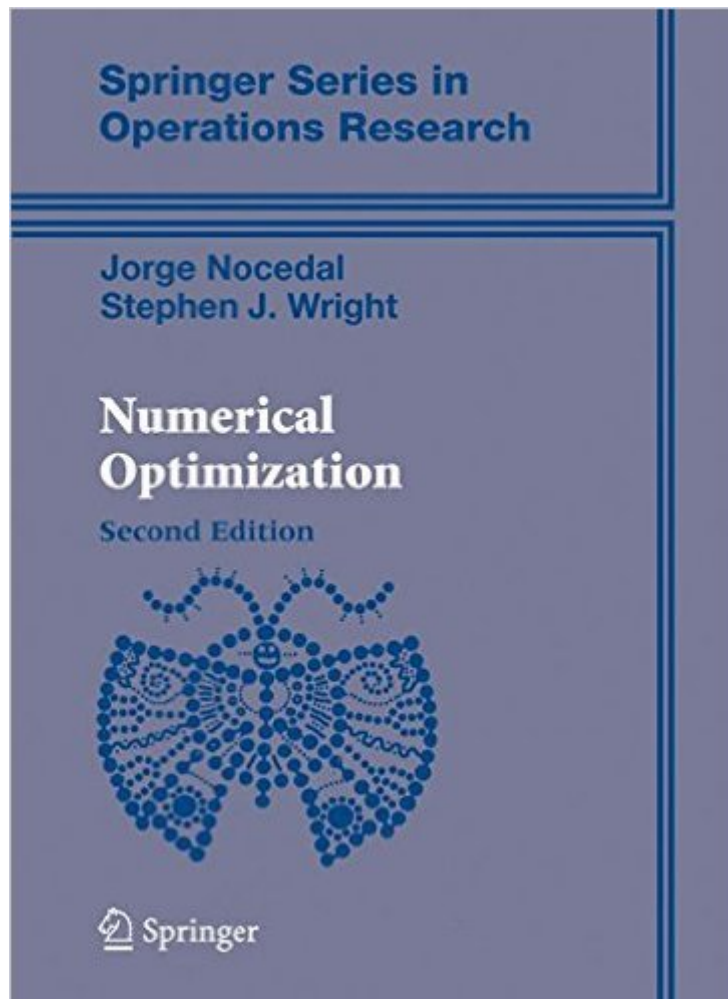# Numerical Optimization (Springer Series In Operations Research And Financial Engineering)

Synopsis

Optimization is an important tool used in decision science and for the analysis of physical systems used in engineering. One can trace its roots to the Calculus of Variations and the work of Euler and Lagrange. This natural and reasonable approach to mathematical programming covers numerical methods for finite-dimensional optimization problems. It begins with very simple ideas progressing through more complicated concepts, concentrating on methods for both unconstrained and constrained optimization.

Book Information

Series: Springer Series in Operations Research and Financial Engineering

Hardcover: 664 pages

Publisher: Springer; 2nd edition (July 27, 2006)

Language: English

ISBN-10: 0387303030

ISBN-13: 978-0387303031

Product Dimensions: 7 x 1.5 x 10 inches

Shipping Weight: 2.6 pounds (View shipping rates and policies)

Average Customer Review: 4.6 out of 5 stars See all reviews (23 customer reviews)

Best Sellers Rank: #28,327 in Books (See Top 100 in Books)   #1 in Books > Science & Math > Mathematics > Applied > Linear Programming   #3 in Books > Science & Math > Mathematics > Number Systems   #6 in Books > Science & Math > Mathematics > Popular & Elementary > Counting & Numeration

Customer Reviews

While I acknowledge the many good points that the other reviewers pointed out, I found this book less than "optimal" in a number of respects.The text is very wordy and yet still sometimes lacks critical explanations. In particular, I found that the motivation for the ideas in earlier chapters is insufficient for the skeptical and questioning reader--one needs to put more trust in the author than I was comfortable with. The lines of reasoning used to motivate the methods are vague: Nocedal spends too much time talking about optimization from a distance. I would have appreciated a book that was more concise and that had more airtight reasoning, exploring questions more thoroughly.I also feel that this book is impoverished with respect to algorithms. One does not encounter enough algorithms early on, and the book does not encourage enough experimentation. It also suffers from the very common "sin" among Numerical mathematics texts--it talks extensively about the

convergence of algorithms before cultivating a deep understanding of those algorithms. The effect is that the reader gets bogged down with technical details. While the motivated reader can go off on her own and experiment to fill in these gaps and piece together the puzzle, I think most people who have this level of initiative and intellectual curiosity would be better served by a book that is more concise.Following on this same theme, the level of explanation is not consistent with the level of background required to read the book. Some things are explained in a level of detail appropriate to an introductory undergraduate text, but the book requires substantial background in multivariable calculus and linear algebra. Someone without prior background in numerical linear algebra will probably find the notation in the book unintuitive and cumbersome; the appendices are of little help. But anyone with sufficient background to fully understand the material in this book will probably find it has too much explanation and moves too slowly.I haven't found a better book on the topic yet; solving such an optimization problem seems to beyond the scope of the algorithms covered in this text. But I do feel confident that this book is not the best, due to the flaws I've mentioned above!

This book is a well-written, outstanding reference for anyone interested in understanding, using, and/or implementing state-of-the-art techniques in nonlinear optimization. Ample attention is paid to both constrained and unconstrained problem types, with a healthy and refreshing emphasis on trust-region strategies, and modern SQP and Interior-Point algorithms. Sufficient detail is paid to most topics while overall perspectives are well-maintained. This book is the very best of its kind for its intended audience. I strongly recommend it.

This book is essential for any optimization guy. Provides most of the available methods including: stochastic gradient, steepest descent, newtons, trust-region methodologies.One of the authors was my professor. So, I am biased toward the quality and the material in this book. Because, indeed the author would deliver the material in a much nicer way than others.

I'm a mechanical engineer by training, and computer vision scientist by experience. If you're into science/engineering and want to go the extra mile and do a little of your own scientific computation thing (you should, high demand niche. Temporarily sacrifice social life while you figure it out), I can't recommend this book enough.It goes over pretty much all the topics, and does so in a very practical manner while avoiding having raw code in the text (hate when authors do that). I especially love the treatment of the trust region method; everything you need to know is there, and the motivations are clear. It is very applied, as it should be given the nature of the topic, but remains mathematically

rigorous throughout.If you want a taste of what's there, search some of Nocedal's fine publications.

The book is quite complete and goes directly to the point. if you ever need optimization in your design you will find it here. Simple and well presented. It has enough details about algorithmic performance and description that should be enough to implement. It is a book that you will never regret having it in your library. If you want something more theoretical useÂ Nonlinear ProgrammingÂ by Bertsekas. If you want to use optimization in your programs use this.

The best text book on the various issues around steepest descent, conjugate gradient, Newtonian methods etc. Clearly show you why you still need to care about steepest-descent even though we were taught it is much slower than Newton or CG. Those that are practical oriented might have ignored the key role SD play in many methods to guarantee convergence (or progress).Very good write up on the Wolfe condition, Cauchy point, and trust region.

This book covers all the frequently appearing optimization problems and the optimization methods.It provides you all the necessary details so that you can understand the mathematical backgrounds and also you can implement the algorithms by yourself. The book is balanced very well. Absolutely great. I love this book.

This textbook is kind of expensive (like many textbooks) but it is worthy. Everything about optimization is inside, well written and in details. And since everything is optimization, it can be really useful for all areas. I have just taken my final today in optimization with Nocedal as the instructor. He is as clear as his book, maybe more funny!

Numerical Optimization (Springer Series in Operations Research and Financial Engineering) Optics: Learning by Computing, with Examples Using MathCad (Springer Series in Operations Research) Hybrid Particle Swarm Algorithm for Multiobjective Optimization: Integrating Particle Swarm Optimization with Genetic Algorithms for Multiobjective Optimization A Primer For The Mathematics Of Financial Engineering, Second Edition (Financial Engineering Advanced Background Series) Solutions Manual - A Linear Algebra Primer for Financial Engineering (Financial Engineering Advanced Background Series) (Volume 4) Statistics and Data Analysis for Financial Engineering: with R examples (Springer Texts in Statistics) Supply Chain Engineering (International Series in Operations Research & Management Science) Differential Evolution: In Search of Solutions

(Springer Optimization and Its Applications) A PROLOG Database System (Electronic & Electrical Engineering Research Studies. Computer Engineering Series ; 3) Numerical Methods in Biomedical Engineering Turbo Codes: Principles and Applications (The Springer International Series in Engineering and Computer Science) Iterative Detection: Adaptivity, Complexity Reduction, and Applications (The Springer International Series in Engineering and Computer Science) Sigma Delta Modulators: Nonlinear Decoding Algorithms and Stability Analysis (The Springer International Series in Engineering and Computer Science) Turbo Coding (The Springer International Series in Engineering and Computer Science) Complexity of Lattice Problems: A Cryptographic Perspective (The Springer International Series in Engineering and Computer Science) WordPress: A Beginner to Intermediate Guide on Successful Blogging and Search Engine Optimization. (Blogging, SEO, Search Engine Optimization, Free Website, WordPress, WordPress for Dummies) Seo 2017: Search Engine Optimization for 2017. On Page SEO, Off Page SEO, Keywords (SEO Books, Search Engine Optimization 2016) SEO 2017: Search Engine Optimization for 2017. On Page SEO, Off Page SEO, Keywords (SEO Books, Search Engine Optimization 2017) SEO+Clickbank (Search Engine Optimization 2016): Use The Power of Search Engine Optimization 2016+ Clickbank Operations Management in the Supply Chain: Decisions and Cases (McGraw-Hill/Irwin Series, Operations and Decision Sciences)