# Problem Complexity And Method Efficiency In Optimization

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Problem Complexity And Method Efficiency In Optimization

(1984). Problem Complexity and Method Efficiency in Optimization. Journal of the Operational Research Society: Vol. 35, No. 5, pp. 455-455.

Problem Complexity and Method Efficiency in Optimization ...

Problem complexity and method efficiency in optimization (Wiley-Interscience series in discrete mathematics) Hardcover – January 1, 1983

Problem complexity and method efficiency in optimization ...

Problem Complexity and Method Efficiency in Optimization (A. S. Nemirovsky and D. B. Yudin) Related Databases. Web of Science You must be logged in with an active subscription to view this. Article Data. History. Published online: 02 August 2006. Publication Data. ISSN (print): 0036-1445.

Problem Complexity and Method Efficiency in Optimization ...

Problem complexity and method efficiency in optimization / A.S. Nemirovsky, D.B. Yudin ; translated by E.R. Dawson.

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Problem Complexity and Method Efficiency in Optimization

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Problem Complexity and Method Efficiency in Optimization ...
To express the time complexity of an algorithm, we use something called the Big O notation. The Big O notation is a language we use to describe the time complexity of an algorithm. It's how we compare the efficiency of different approaches to a problem, and helps us to make decisions.

Time Complexity: How to measure the efficiency of algorithms
Problem Complexity and Method Efficiency in Optimization John Darzentas Journal of the Operational Research Society volume 35 , page 455 ( 1984 ) Cite this article

Problem Complexity and Method Efficiency in Optimization ...
Problem complexity and method efficiency in optimization. Wiley-Interscience series in discrete mathematics. ... In this paper we present a new approach for constructing subgradient schemes for different types of nonsmooth problems with convex structure. Our methods are primaldual since they are always able to generate a feasible approximation ...

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A. S. Nemirovsky and D. B. Yudin, Problem Complexity and Method Efficiency in Optimization, John Wiley and Sons, Chichester, 1983. has been cited by the following article: TITLE: A Parallel Algorithm for Global Optimization Problems in a Distribuited Computing Environment. AUTHORS: Marco Gaviano, Daniela Lera, Elisabetta Mereu

A. S. Nemirovsky and D. B. Yudin, Problem Complexity and ...

Problem complexity and method efficiency in optimization This edition was published in 1983 by Wiley in Chichester, . New York.

Problem complexity and method efficiency in optimization ...

Agreeing on complexity as a problem is one thing, but doing something about it is quite another particularly for managers who are already over-worked, stressed, and can barely keep up with ...

How To Reduce Complexity In Seven Simple Steps

Problem complexity and method efficiency in optimization. This edition published in 1983 by Wiley in Chichester, . New York.

Problem complexity and method efficiency in optimization ...

A. S. Nemirovsky and D. B. Yudin, Problems Complexity and Method Efficiency in Optimization, Wiley-Interscience, New York, 1983. has been cited by the following article: TITLE: Parallel Minimax Searching Algorithm for Extremum of Unimodal Unbounded Function. AUTHORS: Boris S. Verkhovsky

A. S. Nemirovsky and D. B. Yudin, Problems Complexity and ...

Problem Complexity and Method Efficiency in Optimization A.S. NEMIROVSKY and D.B. YUDIN.John Wiley, U.K./U.S.A., 1983. 388 pp. £26.00 ISBN 0 471 10345 4 The book is a translation of the Russian edition and it is based on a number of papers by the authors.

Book Selection - Springer

Problem Complexity and Method Efficiency in Optimization: Nemirovsky, A.S., Yudin, D.B.: Amazon.sg: Books

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Problem Complexity And Method Efficiency In Optimization
Computational complexity theory focuses on classifying computational problems according to their resource usage, and relating these classes to each other. A computational problem is a task solved by a computer. A computation problem is solvable by mechanical application of mathematical steps, such as an algorithm.. A problem is regarded as inherently difficult if its solution requires ...

Computational complexity theory - Wikipedia
Problem complexity and Method Efficiency in Optimization, Wiley, New York (1983) Google Scholar. R.T. Rockafellar. Convex Analysis, Princeton University Press, Princeton, NJ (1970) Google Scholar. R.T. RockafellarMonotone operators and the proximal point algorithm.

In the past few decades, there has been a large amount of work on algorithms for linear network flow problems, special classes of network problems such as assignment problems (linear and quadratic), Steiner tree problem, topology network design and nonconvex cost network flow problems. Network optimization problems find numerous applications in transportation, in communication network design, in production and inventory planning, in facilities location and allocation, and in VLSI design. The purpose of this book is to cover a spectrum of recent developments in network optimization problems, from linear networks to general nonconvex network flow problems. Contents:Greedily Solvable Transportation Networks and Edge-Guided Vertex Elimination (I Adler & R Shamir)Networks Minimizing Length Plus the Number of Steiner Points (T Colthurst et al.)Practical Experiences Using an Interactive Optimization Procedure for Vehicle Scheduling (J R Daduna et al.)Subset Interconnection Designs: Generalizations of Spanning Trees and Steiner Trees (D-Z Du & P M Pardalos)Polynomial and Strongly Polynomial Algorithms for Convex Network Optimization (D S Hochbaum)Hamiltonian Circuits for 2-Regular Interconnection Networks (F K Hwang & W-C W Li)Equivalent Formulations for the Steiner Problem in Graphs (B N Khoury et al.)Minimum Concave-Cost Network Flow Problems with a Single Nonlinear Arc Cost (B Klinz & H Tuy)A Method for Solving Network Flow Problems with General Nonlinear Arc Costs (B W Lamar)Application of Global Line Search in Optimization of Networks (J Mockus)Solving Nonlinear Programs with Embedded Network Structures (M Ç Pinar & S A Zenios)On Algorithms for Nonlinear Dynamic Networks (W B Powell et al.)Strategic and Tactical Models and Algorithms for the Coal Industry Under the 1990 Clean Air Act (H D Sherali & Q J Saifee)Multi-Objective Routing in Stochastic Evacuation Networks (J M Smith)A Simplex Method for Network Programs with Convex Separable Piecewise Linear Costs and Its Application to Stochastic Transshipment Problems (J Sun et al.)A Bibliography on Network Flow

Problems (M Veldhorst)Tabu Search: Applications and Prospects (S Voß)The Shortest Path Network and Its Applications in Bicriteria Shortest Path Problems (G-L Xue & S-Z Sun)A Network Formalism for Pure Exchange Economic Equilibria (L Zhao & A Nagurney)Steiner Problem in Multistage Computer Networks (S Bhattacharya & B Dasgupta) Readership: Applied mathematicians. keywords:This volume reflects the wide spectrum of recent research activities in the design and analysis of algorithms and the applications of networks.Journal of Global Optimization

Computational complexity, originated from the interactions between computer science and numerical optimization, is one of the major theories that have revolutionized the approach to solving optimization problems and to analyzing their intrinsic difficulty. The main focus of complexity is the study of whether existing algorithms are efficient for the solution of problems, and which problems are likely to be tractable. The quest for developing efficient algorithms leads also to elegant general approaches for solving optimization problems, and reveals surprising connections among problems and their solutions. This book is a collection of articles on recent complexity developments in numerical optimization. The topics covered include complexity of approximation algorithms, new polynomial time algorithms for convex quadratic minimization, interior point algorithms, complexity issues regarding test generation of NP-hard problems, complexity of scheduling problems, min-max, fractional combinatorial optimization, fixed point computations and network flow problems. The collection of articles provide a broad spectrum of the direction in which research is going and help to elucidate the nature of computational complexity in optimization. The book will be a valuable source of information to faculty, students and researchers in numerical optimization and related areas. Contents:Average Performance of a Self-Dual Interior Point Algorithm for Linear Programming (K M Anstreicher et al.)The Complexity of Approximating a Nonlinear Program (M Bellare & P Rogaway)Algorithms for the Least Distance Problem (P Berman et al.)Translational Cuts for Convex Minimization (J V Burke et al.)Maximizing Concave Functions in Fixed Dimension (E Cohen & N Megiddo)The Complexity of Allocating Resources in Parallel: Upper and Lower Bounds (E J Friedman)Complexity Issues in Nonconvex Network Flow Problems (G M Guisewite & P M Pardalos)A Classification of Static Scheduling Problems (J W Herrmann et al.)Complexity of Single Machine Hierarchical Scheduling: A Survey (C-Y Lee & G Vairaktarakis)Performance Driven Graph Enchancement Problems (D Paik & S Sahni)Parametric Flows, Weighted Means of Cuts, and Fractional Combinatorial Optimization (T Radzik)Some Complexity Issues Involved in the Construction of Test Cases for NP-Hard Problems (L A Sanchis)Maximizing Nonlinear Concave Functions in Fixed Dimension (S Toledo)A Note on the Complexity of Fixed-Point Computation for Noncontractive Maps (C W Tsay & K Sikorski)Polynomial Time Weak Approximation Algorithms for Quadratic Programming (S A Vavasis)Complexity Results for a Class of Min-Max Problems with Robust Optimization Applications (G Yu & P Kouvelis)and other papers Readership: Applied mathematicians and computer scientists. keywords:

There has been much recent progress in approximation algorithms for nonconvex continuous and discrete problems from both a theoretical and a practical perspective. In discrete (or combinatorial) optimization many approaches have been developed recently that link the discrete universe to the continuous universe through geomet ric, analytic, and algebraic techniques. Such techniques include global optimization formulations, semidefinite programming, and spectral theory. As a result new ap proximate algorithms have been discovered and many new computational approaches have been developed. Similarly, for many continuous nonconvex optimization prob lems, new approximate algorithms have been developed based on semidefinite pro gramming and new randomization techniques. On the other hand, computational complexity, originating from the interactions between computer science and numeri cal optimization, is one of the major theories that have revolutionized the approach to solving optimization problems and to analyzing their intrinsic difficulty. The main focus of complexity is the study of whether existing algorithms are efficient for the solution of problems, and which problems are likely to be tractable. The quest for developing efficient algorithms leads also to elegant general approaches for solving optimization problems, and reveals surprising connections among problems and their solutions. A conference on Approximation and Complexity in Numerical Optimization: Con tinuous and Discrete Problems was held during February 28 to March 2, 1999 at the Center for Applied Optimization of the University of Florida.

This self-contained monograph presents the reader with an authoritative view of Continuous Optimization, an area of mathematical optimization that has experienced major developments during the past 40 years. The book contains results which have not yet been covered in a systematic way as well as a summary of results on NR theory and methods developed over the last several decades. The readership is aimed to graduate students in applied mathematics, computer science, economics, as well as researchers working in optimization and those applying optimization methods for solving real life problems. Sufficient exercises throughout provide graduate students and instructors with practical utility in a two-semester course in Continuous Optimization. The topical coverage includes interior point methods, self-concordance theory and related complexity issues, first and second order methods with accelerated convergence, nonlinear rescaling (NR) theory and exterior point methods, just to mention a few. The book contains a unified approach to both interior and exterior point methods with emphasis of the crucial duality role. One of the main achievements of the book shows what makes the exterior point methods numerically attractive and why. The book is composed in five parts. The first part contains the basics of calculus, convex analysis, elements of unconstrained optimization, as well as classical results of linear and convex optimization. The second part contains the basics of self-concordance theory and interior point methods, including complexity results for LP, QP, and QP with quadratic constraint, semidefinite and conic programming. In the third part, the NR and Lagrangian transformation theories are considered and exterior point methods are described. Three important problems in finding equilibrium are considered in the fourth part. In the fifth and final part of the book, several important applications arising in economics, structural optimization, medicine, statistical learning theory, and more, are detailed. Numerical results, obtained by solving a number of real life and test problems, are also provided.

A complete treatment of fundamentals and recent advances in complexity theory Complexity theory studies the inherent difficulties of solving algorithmic problems by digital computers. This comprehensive work discusses the major topics in complexity theory, including fundamental topics as well as recent breakthroughs not previously available in book form. Theory of Computational Complexity offers a thorough presentation of the fundamentals of complexity theory, including NP-completeness theory, the polynomial-time hierarchy, relativization, and the application to cryptography. It also examines the theory of nonuniform computational complexity, including the computational models of decision trees and Boolean circuits, and the notion of polynomial-time isomorphism. The theory of probabilistic complexity, which studies complexity issues related to randomized computation as well as interactive proof systems and probabilistically checkable proofs, is also covered. Extraordinary in both its breadth and depth, this volume: * Provides complete proofs of recent breakthroughs in complexity theory * Presents results in well-defined form with complete proofs and numerous exercises * Includes scores of graphs and figures to clarify difficult material An invaluable resource for researchers as well as an important guide for graduate and advanced undergraduate students, Theory of Computational Complexity is destined to become the standard reference in the field.

First introductory book to subject; also illustrated with applications.

This is the second volume of a three-volume set comprising a comprehensive study of the tractability of multivariate problems. The second volume deals with algorithms using standard information consisting of function values for the approximation of linear and selected nonlinear functionals. An important example is numerical multivariate integration. The proof techniques used in volumes I and II are quite different. It is especially hard to establish meaningful lower error bounds for the approximation of functionals by using finitely many function values. Here, the concept of decomposable reproducing kernels is helpful, allowing it to find matching lower and upper error bounds for some linear functionals. It is then possible to conclude tractability results from such error bounds. Tractability results, even for linear functionals, are very rich in variety. There are infinite-dimensional Hilbert spaces for which the approximation with an arbitrarily small error of all linear functionals requires only one function value. There are Hilbert spaces for which all nontrivial linear functionals suffer from the curse of dimensionality. This holds for unweighted spaces, where the role of all variables and groups of variables is the same. For weighted spaces one can monitor the role of all variables and groups of variables. Necessary and sufficient conditions on the decay of the weights are given to obtain various notions of tractability. The text contains extensive chapters on discrepancy and integration, decomposable kernels and lower bounds, the Smolyak/sparse grid algorithms, lattice rules and the CBC (component-by-component) algorithms. This is done in various settings. Path integration and quantum computation are also discussed. This volume is of interest to researchers working in computational mathematics, especially in approximation of high-dimensional problems. It is also well suited for graduate courses and seminars. There are 61 open problems listed to stimulate future research in tractability.

Nonsmooth optimization covers the minimization or maximization of functions which do not have the differentiability properties required by classical methods. The field of nonsmooth optimization is significant, not only because of the existence of nondifferentiable functions arising directly in applications, but also because several important methods for solving difficult smooth problems lead directly to the need to solve nonsmooth problems, which are either smaller in dimension or simpler in structure. This book contains twenty five papers written by forty six authors from twenty countries in five continents. It includes papers on theory, algorithms and applications for problems with first-order nondifferentiability (the usual sense of nonsmooth optimization) second-order nondifferentiability, nonsmooth equations, nonsmooth variational inequalities and other problems related to nonsmooth optimization. Contents:Hybrid Methods for Finding the Nearest Euclidean Distance Matrix (S Al-Homidan & R Fletcher)On Generalized Differentiability of Optimal Solutions and Its Application to an Algorithm for Solving Bilevel Optimization Problems (S Dempe)An Elementary Rate of Convergence Proof for the Deep Cut Ellipsoid Algorithm (J B G Frenk & J Gromicho)On Second-Order Directional Derivatives in Nonsmooth Optimization (L R Huang & K F Ng)Sensitivity of Solutions in Nonlinear Programming Problems with Nonunique Multipliers (A B Levy & R T Rockafellar)Necessary and Sufficient Conditions for Solution Stability of Parametric Nonsmooth Equations (J-S Pang)Characterizations of Optimality for Homogeneous Programming Problems with Applications (A M Rubinov & B M Glover)A Globally Convergent Newton Method for Solving Variational Inequality Problems with Inequality Constraints (K Taji & M Fukushima)A Successive Approximation Quasi-Newton Process for Nonlinear Complementarity Problem (S-Z Zhou et al.)and other papers Readership: Students, academics and industry professionals. keywords:

This work presents lines of investigation and scientific achievements of the Ukrainian school of optimization theory and adjacent disciplines. These include the development of approaches to mathematical theories, methodologies, methods, and application systems for the solution of applied problems in economy, finances, energy saving, agriculture, biology, genetics, environmental protection, hardware and software engineering, information protection, decision making, pattern recognition, self-adapting control of complicated objects, personnel training, etc. The methods developed include sequential analysis of variants, nondifferential optimization, stochastic optimization, discrete optimization, mathematical modeling, econometric modeling, solution of extremum problems on graphs, construction of discrete images and combinatorial recognition, etc. Some of these methods became well known in the world's mathematical community and are now known as classic methods.