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Matrix Algebra Karim M. Abadir 2005-08-22 A stand-alone textbook in matrix algebra for econometricians and statisticians - advanced undergraduates, postgraduates and teachers.
Advances in Neural Networks -- ISNN 2011 Derong Liu 2011-05-20 The three-volume set LNCS 6675, 6676 and 6677 constitutes the refereed proceedings of the 8th International Symposium on Neural Networks, ISNN 2011, held in Guilin, China, in May/June 2011. The total of 215 papers presented in all three volumes were carefully reviewed and selected from 651 submissions. The contributions are structured in topical sections on computational neuroscience and cognitive science; neurodynamics and complex systems; stability and convergence analysis; neural network models; supervised learning and unsupervised learning; kernel methods and support vector machines; mixture models and clustering; visual perception and pattern recognition; motion, tracking and object recognition; natural scene analysis and speech recognition; neuromorphic hardware, fuzzy neural networks and robotics; multi-agent systems and adaptive dynamic programming; reinforcement learning and decision making; action and motor control; adaptive and hybrid intelligent systems; neuroinformatics and bioinformatics; information retrieval; data mining and knowledge discovery; and natural language processing.
Problems In Linear Algebra And Matrix Theory Fuzhen Zhang 2021-10-25 This is the revised and expanded edition of the problem book Linear Algebra: Challenging Problems for Students, now entitled Problems in Linear Algebra and Matrix Theory. This new edition contains about fifty-five examples and many new problems, based on the author's lecture notes of Advanced Linear Algebra classes at Nova Southeastern University (NSU-Florida) and short lectures Matrix Gems at Shanghai University and Beijing Normal University.The book is intended for upper division undergraduate and beginning graduate students, and it can be used as text or supplement for a second course in linear algebra. Each chapter starts with Definitions, Facts, and Examples, followed by problems. Hints and solutions to all problems are also provided.
Mathematical Principles of Decision Making (Principia Mathematica Decernendi) Thomas L. Saaty In this book Thomas Saaty summarizes his Analytic Hierarchy Process (AHP) theory for measuring intangible factors through paired comparisons using judgments from which priorities are derived that give the relative dominance of these factors. The important concepts of the AHP and its generalization to structures with dependence and feedback, the Analytic Network Process (ANP), are presented in an elegant compact way and new extensions of the theory to complex decisions involving benefits, opportunities, costs and risks are presented. Applications to resource allocation and conflict resolution are included. The generalization to continuous comparisons is covered. The Encyclicon, three volumes are now available, is an encyclopedia of applications that is a useful accompaniment to the Principles of Mathematical Decision Making, containing of examples of practical decisions.
Templates for the Solution of Algebraic Eigenvalue Problems Zhaojun Bai 2000-01-01 Mathematics of Computing -- Numerical Analysis.
Iterative Methods for Solving Linear Systems Anne Greenbaum 1997-01-01 Much recent research has concentrated on the efficient solution of large sparse or

structured linear systems using iterative methods. A language loaded with acronyms for a thousand different algorithms has developed, and it is often difficult even for specialists to identify the basic principles involved. Here is a book that focuses on the analysis of iterative methods. The author includes the most useful algorithms from a practical point of view and discusses the mathematical principles behind their derivation and analysis. Several questions are emphasized throughout: Does the method converge? If so, how fast? Is it optimal, among a certain class? If not, can it be shown to be near-optimal? The answers are presented clearly, when they are known, and remaining important open questions are laid out for further study. Greenbaum includes important material on the effect of rounding errors on iterative methods that has not appeared in other books on this subject. Additional important topics include a discussion of the open problem of finding a provably near-optimal short recurrence for non-Hermitian linear systems; the relation of matrix properties such as the field of values and the pseudospectrum to the convergence rate of iterative methods; comparison theorems for preconditioners and discussion of optimal preconditioners of specified forms; introductory material on the analysis of incomplete Cholesky, multigrid, and domain decomposition preconditioners, using the diffusion equation and the neutron transport equation as example problems. A small set of recommended algorithms and implementations is included.

Numerical Solution of Algebraic Riccati Equations Dario A. Bini 2011-01-01 This treatment of the basic theory of algebraic Riccati equations describes the classical as well as the more advanced algorithms for their solution in a manner that is accessible to both practitioners and scholars. It is the first book in which nonsymmetric algebraic Riccati equations are treated in a clear and systematic way. Some proofs of theoretical results have been simplified and a unified notation has been adopted. Readers will find a unified discussion of doubling algorithms, which are effective in solving algebraic Riccati equations as well as a detailed description of all classical and advanced algorithms for solving algebraic Riccati equations and their MATLAB codes. This will help the reader gain an understanding of the computational issues and provide ready-to-use implementation of the different solution techniques.

Introduction to Digital Communications Joachim Speidel 2021-04-02 This book offers students, scientists, and engineers an extensive introduction to the theoretical fundamentals of digital communications, covering single-input single-output (SISO), multiple-input multiple-output (MIMO), and time-variant systems. Further, the main content is supplemented by a wealth of representative examples and computer simulations. The book is divided into three parts, the first of which addresses the principles of wire-line and wireless digital transmission over SISO links. Digital modulation, intersymbol interference, and various detection methods are discussed; models for realistic time-variant, wireless channels are introduced; and the equivalent time-variant baseband system model is derived. This book covers two new topics such as blockwise signal transmission and multicarrier modulation with orthogonal frequency-division multiplexing (OFDM) systems. Since not all readers may be familiar with this topic, Part II is devoted to the theory of linear time-variant systems. The generalized convolution is derived, and readers are introduced to impulse response, the delay spread function, and system functions in the frequency domain. In addition, randomly changing systems are discussed. Several new examples and graphs have been added to this book. In turn, Part III deals with MIMO systems. It describes MIMO channel models with and without spatial correlation, including the Kronecker model. Both linear and nonlinear MIMO receivers are investigated. The question of how many bits per channel use can be transmitted is answered, and maximizing channel capacity is addressed. Principles of space–time coding are outlined in order to improve transmission quality and increase data rates. In closing, the book describes multi-user MIMO schemes, which reduce interference when multiple users in the same area transmit their signals in the same time slots and frequency bands.

Impulsive Differential Equations: Asymptotic Properties of the Solutions D D Bainov 1995-03-29 The question of the presence of various asymptotic properties of the solutions of ordinary differential equations arises when solving various practical problems. The investigation of these questions is still more important for impulsive differential equations which have a wider field of application than the ordinary ones. The results obtained by treating the asymptotic properties of the solutions of impulsive differential equations can be found in numerous separate articles. The systematized exposition of these results in a separate book will satisfy the growing interest in the problems related to the asymptotic properties of the solutions of impulsive differential equations and their applications. Contents:Preliminary NotesAsymptotic FormulaeConvergence of the SolutionsAsymptotic EquivalenceReferencesAuthor IndexSubject Index Readership: Applied mathematicians, physicists, chemists, engineers and economists. keywords:Asymptotic Behaviour;Linear and Weakly Nonlinear Impulsive Systems;Comparison System

Interval Analysis Günter Mayer 2017-04-10 This self-contained text is a step-by-step introduction and a complete overview of interval computation and result verification, a subject whose importance has steadily increased over the past many years. The author, an expert in the field, gently presents the theory of interval analysis through many examples and exercises, and guides the reader from the basics of the theory to current research topics in the mathematics of computation. Contents Preliminaries Real intervals Interval vectors, interval matrices Expressions, P-contraction, ?-inflation Linear systems of equations Nonlinear systems of

equations Eigenvalue problems Automatic differentiation Complex intervals

Problems and Solutions in Introductory and Advanced Matrix Calculus Willi-Hans Steeb 2016-07-14 This book provides an extensive collection of problems with detailed solutions in introductory and advanced matrix calculus. Supplementary problems in each chapter will challenge and excite the reader, ideal for both graduate and undergraduate mathematics and theoretical physics students. The coverage includes systems of linear equations, linear differential equations, integration and matrices, Kronecker product and vec-operation as well as functions of matrices. Furthermore, specialized topics such as spectral theorem, nonnormal matrices and mutually unbiased bases are included. Many of the problems are related to applications for group theory, Lie algebra theory, wavelets, graph theory and matrix-valued differential forms, benefitting physics and engineering students and researchers alike. It also branches out to problems with tensors and the hyperdeterminant. Computer algebra programs in Maxima and SymbolicC++ have also been provided.

Linear Algebra, Markov Chains, and Queueing Models Carl D. Meyer 2012-12-06 This IMA Volume in Mathematics and its Applications LINEAR ALGEBRA, MARKOV CHAINS, AND QUEUEING MODELS is based on the proceedings of a workshop which was an integral part of the 1991-92 IMA program on "Applied Linear Algebra". We thank Carl Meyer and R.J. Plemmons for editing the proceedings. We also take this opportunity to thank the National Science Founda tion, whose financial support made the workshop possible. A vner Friedman Willard Miller, Jr. xi PREFACE This volume contains some of the lectures given at the workshop Lin ear Algebra, Markov Chains, and Queueing Models held January 13-17, 1992, as part of the Year of Applied Linear Algebra at the Institute for Mathematics and its Applications. Markov chains and queueing models play an increasingly important role in the understanding of complex systems such as computer, communi cation, and transportation systems. Linear algebra is an indispensable tool in such research, and this volume collects a selection of important papers in this area. The articles contained herein are representative of the underlying purpose of the workshop, which was to bring together practitioners and re searchers from the areas of linear algebra, numerical analysis, and queueing theory who share a common interest of analyzing and solving finite state Markov chains. The papers in this volume are grouped into three major categories-perturbation theory and error analysis, iterative methods, and applications regarding queueing models.

Some Tapas of Computer Algebra Arjeh M. Cohen 1998-12-15 This book presents the basic concepts and algorithms of computer algebra using practical examples that illustrate their actual use in symbolic computation. A wide range of topics are presented, including: Groebner bases, real algebraic geometry, lie algebras, factorization of polynomials, integer programming, permutation groups, differential equations, coding theory, automatic theorem proving, and polyhedral geometry. This book is a must read for anyone working in the area of computer algebra, symbolic computation, and computer science.

Smart Charging Solutions for Hybrid and Electric Vehicles Sulabh Sachan 2022-03-02 SMART CHARGING SOLUTIONS The most comprehensive and up-to-date study of smart charging solutions for hybrid and electric vehicles for engineers, scientists, students, and other professionals. As our dependence on fossil fuels continues to wane all over the world, demand for dependable and economically feasible energy sources continues to grow. As environmental regulations become more stringent, energy production is relying more and more heavily on locally available renewable resources. Furthermore, fuel consumption and emissions are facilitating the transition to sustainable transportation. The market for electric vehicles (EVs) has been increasing steadily over the past few years throughout the world. With the increasing popularity of EVs, a competitive market between charging stations (CSS) to attract more EVs is expected. This outstanding new volume is a resource for engineers, researchers, and practitioners interested in getting acquainted with smart charging for electric vehicles technologies. It includes many chapters dealing with the state-of-the-art studies on EV smart charging along with charging infrastructure. Whether for the veteran engineer or student, this is a must-have volume for any library. Smart Charging Solutions for Hybrid and Electric Vehicles: Presents the state of the art of smart charging for hybrid and electric vehicles, from a technological point of view Focuses on optimization and prospective solutions for practical problems Covers the most important recent developmental technologies related to renewable energy, to keep the engineer up to date and well informed Includes economic considerations, such as business models and price structures Covers standards and regulatory frameworks for smart charging solutions

Computational Science — ICCS 2004 Marian Bubak 2004-10-11 The International Conference on Computational Science (ICCS 2004) held in Krak ? ow, Poland, June 6–9, 2004, was a follow-up to the highly successful ICCS 2003 held at two locations, in Melbourne, Australia and St. Petersburg, Russia; ICCS 2002 in Amsterdam, The Netherlands; and ICCS 2001 in San Francisco, USA. As computational science is still evolving in its quest for subjects of inves- gation and e?cient methods, ICCS 2004 was devised as a forum for scientists from mathematics and computer science, as the basic computing disciplines and application areas, interested in advanced computational methods for physics, chemistry, life sciences, engineering, arts and humanities, as well as computer system vendors and

software developers. The main objective of this conference was to discuss problems and solutions in all areas, to identify new issues, to shape future directions of research, and to help users apply various advanced computational techniques. The event harvested recent developments in com-tationalgridsandnextgenerationcomputingsystems,tools,advancednumerical methods, data-driven systems, and novel application ?elds, such as complex - stems, ?nance, econo-physics and population evolution.

Convex Optimization Stephen Boyd 2004-03-08 A comprehensive introduction to the tools, techniques and applications of convex optimization.

Numerical Linear Algebra: Theory and Applications Larisa Beilina 2017-09-19 This book combines a solid theoretical background in linear algebra with practical algorithms for numerical solution of linear algebra problems. Developed from a number of courses taught repeatedly by the authors, the material covers topics like matrix algebra, theory for linear systems of equations, spectral theory, vector and matrix norms combined with main direct and iterative numerical methods, least squares problems, and eigenproblems. Numerical algorithms illustrated by computer programs written in MATLAB® are also provided as supplementary material on SpringerLink to give the reader a better understanding of professional numerical software for the solution of real-life problems. Perfect for a one- or two-semester course on numerical linear algebra, matrix computation, and large sparse matrices, this text will interest students at the advanced undergraduate or graduate level.

Numerical Challenges in Lattice Quantum Chromodynamics Andreas Frommer 2012-12-06 Lattice gauge theory is a fairly young research area in Theoretical Particle Physics. It is of great promise as it offers the framework for an ab-initio treatment of the nonperturbative features of strong interactions. Ever since its adolescence the simulation of quantum chromodynamics has attracted the interest of numerical analysts and there is growing interdisciplinary engage ment between theoretical physicists and applied mathematicians to meet the grand challenges of this approach. This volume contains contributions of the interdisciplinary workshop "Nu merical Challenges in Lattice Quantum Chromo dynamics" that the Institute of Applied Computer Science (IAI) at Wuppertal University together with the Von-Neumann-Institute-for-Computing (NIC) organized in August 1999. The purpose of the workshop was to offer a platform for the exchange of key ideas between lattice QCD and numerical analysis communities. In this spirit leading experts from both fields have put emphasis to transcend the barriers between the disciplines. The meetings was focused on the following numerical bottleneck problems: A standard topic from the infancy of lattice QCD is the computation of Green's functions, the inverse of the Dirac operator. One has to solve huge sparse linear systems in the limit of small quark masses, corresponding to high condition numbers of the Dirac matrix. Closely related is the determination of flavor-singlet observables which came into focus during the last years.

Numerical Linear Algebra and Matrix Factorizations Tom Lyche 2020-03-02 After reading this book, students should be able to analyze computational problems in linear algebra such as linear systems, least squares- and eigenvalue problems, and to develop their own algorithms for solving them. Since these problems can be large and difficult to handle, much can be gained by understanding and taking advantage of special structures. This in turn requires a good grasp of basic numerical linear algebra and matrix factorizations. Factoring a matrix into a product of simpler matrices is a crucial tool in numerical linear algebra, because it allows us to tackle complex problems by solving a sequence of easier ones. The main characteristics of this book are as follows: It is self-contained, only assuming that readers have completed first-year calculus and an introductory course on linear algebra, and that they have some experience with solving mathematical problems on a computer. The book provides detailed proofs of virtually all results. Further, its respective parts can be used independently, making it suitable for self-study. The book consists of 15 chapters, divided into five thematically oriented parts. The chapters are designed for a one-week-per-chapter, one-semester course. To facilitate self-study, an introductory chapter includes a brief review of linear algebra.

Complex Conjugate Matrix Equations for Systems and Control Ai-Guo Wu 2016-08-08 The book is the first book on complex matrix equations including the conjugate of unknown matrices. The study of these conjugate matrix equations is motivated by the investigations on stabilization and model reference tracking control for discrete-time antilinear systems, which are a particular kind of complex system with structure constraints. It proposes useful approaches to obtain iterative solutions or explicit solutions for several types of complex conjugate matrix equation. It observes that there are some significant differences between the real/complex matrix equations and the complex conjugate matrix equations. For example, the solvability of a real Sylvester matrix equation can be characterized by matrix similarity; however, the solvability of the con-Sylvester matrix equation in complex conjugate form is related to the concept of con-similarity. In addition, the new concept of conjugate product for complex polynomial matrices is also proposed in order to establish a unified approach for solving a type of complex matrix equation.

Numerical Methods for Linear Control Systems Biswa Datta 2004-02-24 Numerical Methods for Linear Control Systems Design and Analysis is an interdisciplinary textbook aimed at systematic descriptions and implementations of numerically-viable algorithms based on well-established, efficient and stable modern numerical linear techniques for mathematical problems arising in the design and analysis of linear control systems both for the first- and second-order models. Unique coverage

of modern mathematical concepts such as parallel computations, second-order systems, and large-scale solutions Background material in linear algebra, numerical linear algebra, and control theory included in text Step-by-step explanations of the algorithms and examples

Matrix Computations Gene H. Golub 2013 This revised edition provides the mathematical background and algorithmic skills required for the production of numerical software. It includes rewritten and clarified proofs and derivations, as well as new topics such as Arnoldi iteration, and domain decomposition methods.

Saddle-Point Problems and Their Iterative Solution Miroslav Rozložník 2018-11-19 This book provides essential lecture notes on solving large linear saddle-point systems, which arise in a wide range of applications and often pose computational challenges in science and engineering. The focus is on discussing the particular properties of such linear systems, and a large selection of algebraic methods for solving them, with an emphasis on iterative methods and preconditioning. The theoretical results presented here are complemented by a case study on potential fluid flow problem in a real world-application. This book is mainly intended for students of applied mathematics and scientific computing, but also of interest for researchers and engineers working on various applications. It is assumed that the reader has completed a basic course on linear algebra and numerical mathematics.

Numerical Algebra, Matrix Theory, Differential-Algebraic Equations and Control Theory Peter Benner 2015-05-09 This edited volume highlights the scientific contributions of Volker Mehrmann, a leading expert in the area of numerical (linear) algebra, matrix theory, differential-algebraic equations and control theory. These mathematical research areas are strongly related and often occur in the same real-world applications. The main areas where such applications emerge are computational engineering and sciences, but increasingly also social sciences and economics. This book also reflects some of Volker Mehrmann's major career stages. Starting out working in the areas of numerical linear algebra (his first full professorship at TU Chemnitz was in "Numerical Algebra," hence the title of the book) and matrix theory, Volker Mehrmann has made significant contributions to these areas ever since. The highlights of these are discussed in Parts I and II of the present book. Often the development of new algorithms in numerical linear algebra is motivated by problems in system and control theory. These and his later major work on differential-algebraic equations, to which he together with Peter Kunkel made many groundbreaking contributions, are the topic of the chapters in Part III. Besides providing a scientific discussion of Volker Mehrmann's work and its impact on the development of several areas of applied mathematics, the individual chapters stand on their own as reference works for selected topics in the fields of numerical (linear) algebra, matrix theory, differential-algebraic equations and control theory.

Optimization of Linear Control Systems F A Aliev 1998-11-19 The authors present analytical methods for synthesis of linear stationary and periodical optimal controlled systems, and create effective computational algorithms for synthesis of optimal regulators and filters. The procedures of Youla-Jabr-Bongiorno (1976) and Desoer-Lin-Murray-Saeks (1980) are special cases of this procedure. The monograph also includes original computational algorithms (solutions of usual and generalized Lyapunov and Riccati equations, polynomial matrix factorization) and illustrates the effectiveness of these algorithms by examples in the field of numerical methods for optimization of linear controlled systems.

Perturbation Theory for Matrix Equations M. Konstantinov 2003-05-20 The book is devoted to the perturbation analysis of matrix equations. The importance of perturbation analysis is that it gives a way to estimate the influence of measurement and/or parametric errors in mathematical models together with the rounding errors done in the computational process. The perturbation bounds may further be incorporated in accuracy estimates for the solution computed in finite arithmetic. This is necessary for the development of reliable computational methods, algorithms and software from the viewpoint of modern numerical analysis. In this book a general perturbation theory for matrix algebraic equations is presented. Local and non-local perturbation bounds are derived for general types of matrix equations as well as for the most important equations arising in linear algebra and control theory. A large number of examples, tables and figures is included in order to illustrate the perturbation techniques and bounds. Key features: • The first book in this field • Can be used by a variety of specialists • Material is self-contained • Results can be used in the development of reliable computational algorithms • A large number of examples and graphical illustrations are given • Written by prominent specialists in the field

Recent Advances in Iterative Methods Gene Golub 2012-12-06 This IMA Volume in Mathematics and its Applications RECENT ADVANCES IN ITERATIVE METHODS is based on the proceedings of a workshop that was an integral part of the 1991-92 IMA program on "Applied Linear Algebra. " Large systems of matrix equations arise frequently in applications and they have the prop erty that they are sparse and/or structured. The purpose of this workshop was to bring together researchers in numerical analysis and various ap plication areas to discuss where such problems arise and possible meth ods of solution. The last two days of the meeting were a celebration dedicated to Gene Golub on the occasion of his sixtieth birthday, with the program arranged by Jack Dongarra and Paul van Dooren. We

are grateful to Richard Brualdi, George Cybenko, Alan George, Gene Golub, Mitchell Luskin, and Paul Van Dooren for planning and implementing the year-long program. We especially thank Gene Golub, Anne Greenbaum, and Mitchell Luskin for organizing this workshop and editing the proceed ings. The financial support of the National Science Foundation and the Min nesota Supercomputer Institute made the workshop possible. A vner Friedman Willard Miller, Jr. xi PREFACE The solution of very large linear algebra problems is an integral part of many scientific computations.

Numerical Linear Algebra in Signals, Systems and Control Paul Van Dooren 2011-05-21 The purpose of Numerical Linear Algebra in Signals, Systems and Control is to present an interdisciplinary book, blending linear and numerical linear algebra with three major areas of electrical engineering: Signal and Image Processing, and Control Systems and Circuit Theory. Numerical Linear Algebra in Signals, Systems and Control will contain articles, both the state-of-the-art surveys and technical papers, on theory, computations, and applications addressing significant new developments in these areas. The goal of the volume is to provide authoritative and accessible accounts of the fast-paced developments in computational mathematics, scientific computing, and computational engineering methods, applications, and algorithms. The state-of-the-art surveys will benefit, in particular, beginning researchers, graduate students, and those contemplating to start a new direction of research in these areas. A more general goal is to foster effective communications and exchange of information between various scientific and engineering communities with mutual interests in concepts, computations, and workable, reliable practices.

Sparse Solutions of Underdetermined Linear Systems and Their Applications Ming-Jun Lai 2021-06-25 This textbook presents a special solution to underdetermined linear systems where the number of nonzero entries in the solution is very small compared to the total number of entries. This is called a sparse solution. Since underdetermined linear systems can be very different, the authors explain how to compute a sparse solution using many approaches. Sparse Solutions of Underdetermined Linear Systems and Their Applications contains 64 algorithms for finding sparse solutions of underdetermined linear systems and their applications for matrix completion, graph clustering, and phase retrieval and provides a detailed explanation of these algorithms including derivations and convergence analysis. Exercises for each chapter help readers understand the material. This textbook is appropriate for graduate students in math and applied math, computer science, statistics, data science, and engineering. Advisors and postdoctoral scholars will also find the book interesting and useful.

Nonlinear Water Waves David Henry 2019-11-27 The motion of water is governed by a set of mathematical equations which are extremely complicated and intractable. This is not surprising when one considers the highly diverse and intricate physical phenomena which may be exhibited by a given body of water. Recent mathematical advances have enabled researchers to make major progress in this field, reflected in the topics featured in this volume. Cutting-edge techniques and tools from mathematical analysis have generated strong rigorous results concerning the qualitative and quantitative physical properties of solutions of the governing equations. Furthermore, accurate numerical computations of fully-nonlinear steady and unsteady water waves in two and three dimensions have contributed to the discovery of new types of waves. Model equations have been derived in the long-wave and modulational regime using Hamiltonian formulations and solved numerically. This book brings together interdisciplinary researchers working in the field of nonlinear water waves, whose contributions range from survey articles to new research results which address a variety of aspects in nonlinear water waves. It is motivated by a workshop which was organised at the Erwin Schrödinger International Institute for Mathematics and Physics in Vienna, November 27-December 7, 2017. The key aim of the workshop was to describe, and foster, new approaches to research in this field. This is reflected in the contents of this book, which is aimed to stimulate both experienced researchers and students alike.

World Congress of Nonlinear Analysts '92 V. Lakshmikantham 1996-01-01

Linear Operators and Matrices Peter Lancaster 2002 In September 1998, during the 'International Workshop on Analysis and Vibrat ing Systems' held in Canmore, Alberta, Canada, it was decided by a group of participants to honour Peter Lancaster on the occasion of his 70th birthday with a volume in the series 'Operator Theory: Advances and Applications'. Friends and colleagues responded enthusiastically to this proposal and within a short time we put together the volume which is now presented to the reader. Regarding accep tance of papers we followed the usual rules of the journal 'Integral Equations and Operator Theory'. The papers are dedicated to different problems in matrix and operator theory, especially to the areas in which Peter contributed so richly. At our request, Peter agreed to write an autobiographical paper, which appears at the beginning of the volume. It continues with the list of Peter's publications. We believe that this volume will pay tribute to Peter on his outstanding achievements in different areas of mathematics. 1. Gohberg, H. Langer P ter Lancast r *1929 Operator Theory: Advances and Applications, Vol. 130, 1- 7 © 2001 Birkhiiuser Verlag Basel/Switzerland My Life and Mathematics Peter Lancaster I was born in Appleby, a small county town in the north of England, on November 14th, 1929. I had two older brothers and was to have one younger sister. My family moved around the north of England as my father's work in

an insurance company required.

Numerical Solution of Time-Dependent Advection-Diffusion-Reaction Equations Willem Hundsdorfer 2013-04-17 Unique book on Reaction-Advection-Diffusion problems

Princeton Companion to Applied Mathematics Nicholas J. Higham 2015-09-09 This is the most authoritative and accessible single-volume reference book on applied mathematics. Featuring numerous entries by leading experts and organized thematically, it introduces readers to applied mathematics and its uses; explains key concepts; describes important equations, laws, and functions; looks at exciting areas of research; covers modeling and simulation; explores areas of application; and more. Modeled on the popular Princeton Companion to Mathematics, this volume is an indispensable resource for undergraduate and graduate students, researchers, and practitioners in other disciplines seeking a user-friendly reference book on applied mathematics. Features nearly 200 entries organized thematically and written by an international team of distinguished contributors Presents the major ideas and branches of applied mathematics in a clear and accessible way Explains important mathematical concepts, methods, equations, and applications Introduces the language of applied mathematics and the goals of applied mathematical research Gives a wide range of examples of mathematical modeling Covers continuum mechanics, dynamical systems, numerical analysis, discrete and combinatorial mathematics, mathematical physics, and much more Explores the connections between applied mathematics and other disciplines Includes suggestions for further reading, cross-references, and a comprehensive index

Matrix Analysis Roger A. Horn 1990-02-23 Matrix Analysis presents the classical and recent results for matrix analysis that have proved to be important to applied mathematics.

Generalized Inverses: Theory and Computations Guorong Wang 2018-05-12 This book begins with the fundamentals of the generalized inverses, then moves to more advanced topics. It presents a theoretical study of the generalization of Cramer's rule, determinant representations of the generalized inverses, reverse order law of the generalized inverses of a matrix product, structures of the generalized inverses of structured matrices, parallel computation of the generalized inverses, perturbation analysis of the generalized inverses, an algorithmic study of the computational methods for the full-rank factorization of a generalized inverse, generalized singular value decomposition, imbedding method, finite method, generalized inverses of polynomial matrices, and generalized inverses of linear operators. This book is intended for researchers, postdocs, and graduate students in the area of the generalized inverses with an undergraduate-level understanding of linear algebra.

Affine Arithmetic Based Solution of Uncertain Static and Dynamic Problems Snehashish Chakraverty 2022-05-31 Uncertainty is an inseparable component of almost every measurement and occurrence when dealing with real-world problems. Finding solutions to real-life problems in an uncertain environment is a difficult and challenging task. As such, this book addresses the solution of uncertain static and dynamic problems based on affine arithmetic approaches. Affine arithmetic is one of the recent developments designed to handle such uncertainties in a different manner which may be useful for overcoming the dependency problem and may compute better enclosures of the solutions. Further, uncertain static and dynamic problems turn into interval and/or fuzzy linear/nonlinear systems of equations and eigenvalue problems, respectively. Accordingly, this book includes newly developed efficient methods to handle the said problems based on the affine and interval/fuzzy approach. Various illustrative examples concerning static and dynamic problems of structures have been investigated in order to show the reliability and efficacy of the developed approaches.

Mathematical works Helmut Wielandt 1996

Topics in Matrix Analysis Roger A. Horn 1994-06-24 Building on the foundations of its predecessor volume, Matrix Analysis, this book treats in detail several topics in matrix theory not included in the previous volume, but with important applications and of special mathematical interest. As with the previous volume, the authors assume a background knowledge of elementary linear algebra and rudimentary analytical concepts. Many examples and exercises of varying difficulty are included.

Facility Layout Miguel F. Anjos 2021-04-24 This book presents a structured approach to develop mathematical optimization formulations for several variants of facility layout. The range of layout problems covered includes row layouts, floor layouts, multi-floor layouts, and dynamic layouts. The optimization techniques used to formulate the problems are primarily mixed-integer linear programming, second-order conic programming, and semidefinite programming. The book also covers important practical considerations for solving the formulations. The breadth of approaches presented help the reader to learn how to formulate a variety of problems using mathematical optimization techniques. The book also illustrates the use of layout formulations in selected engineering applications, including manufacturing,

building design, automotive, and hospital layout.