Fast And Elegant Numerical Linear Algebra Using The

Algorithms and Theory in Filtering and Control
Financial Risk Modelling and Portfolio Optimization with R
High Performance Computing Systems and Applications
Current State and Future Perspectives
Spectral Methods in MATLAB
Krylov Methods for Nonsymmetric Linear Systems
Second Edition
Computational Methods in Physics
Tools and Mathematics
ESREL 2015
Modern Statistical Methods for Health Research
Numerical Linear Algebra Techniques for Systems and Control
Seamless R and C++ Integration with Rcpp
Basic Environmental Data Analysis for Scientists and Engineers
Iterative Identification and Control
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Functions of Matrices
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Recent Theoretical Developments and Applications
Numerical Mathematics and Advanced Applications ENUMATH 2015
Computational Modeling and Simulation of Intellect: Current State and Future Perspectives
Magnetohydrodynamics of Laboratory and Astrophysical Plasmas
Applied Numerical Linear Algebra
Handbook of Time Series Analysis
Non-Gaussian Random Vibration Fatigue Analysis and Accelerated Test
Numerical Linear Algebra for High-performance Computers

Compendium for Students
Iterative Methods for Sparse Linear Systems
Linear Algebra and Its Applications
Numerical Linear Algebra
A Mathematical Introduction
Introduction to Numerical Linear Algebra and Optimisation
Methods for Computer Vision, Machine Learning, and Graphics
Advanced R Statistical Programming and Data Models
Computational Ocean Acoustics
A Tutorial in Theory and Applications
Advances in Theory and Applications
Numerical Analysis
Theory and Computation
Theory and Computation

MATHEWS MCMAHON

Algorithms and Theory in Filtering and Control Springer
Classroom tested and the result of over 30 years of teaching and research, this textbook is an invaluable tool for undergraduate and graduate data analysis courses in environmental sciences and engineering. It is also a useful reference on modern digital data analysis for the extensive and growing community of Earth scientists and engineers. Basic Environmental Data Analysis for Scientists and Engineers introduces practical concepts of modern digital data analysis and graphics, including numerical/graphical calculus, measurement units and dimensional analysis, error propagation and statistics, and least squares data modeling. It emphasizes array-based or matrix inversion and spectral analysis using the fast Fourier transform (FFT) that dominates modern data analysis. Divided into two parts, this comprehensive hands-on textbook is excellent for exploring data analysis principles and practice using MATLAB®, Mathematica, Mathcad, and other modern equation solving software. Part I, for beginning undergraduate students, introduces the basic approaches for quantifying data variations in terms of environmental parameters. These approaches emphasize uses of the data array or matrix, which is the fundamental data and mathematical processing format of modern electronic computing. Part II, for advanced undergraduate and beginning

graduate students, extends the inverse problem to least squares solutions involving more than two unknowns. Features: Offers a uniquely practical guide for making students proficient in modern electronic data analysis and graphics Includes topics that are not explained in any existing textbook on environmental data analysis Data analysis topics are very well organized into a two-semester course that meets general education curriculum requirements in science and engineering Facilitates learning by beginning each chapter with an ‘Overview’ section highlighting the topics covered, and ending it with a ‘Key Concepts’ section summarizing the main technical details that the reader should have acquired Indexes many numerical examples for ready access in the classroom or other venues serviced by electronic equation solvers like MATLAB®, Mathematica, Mathcad, etc. Offers supplemental exercises and materials to enhance understanding the principles and practice of modern data analysis

Financial Risk Modelling and Portfolio Optimization with R SIAM

Numerical Algorithms: Methods for Computer Vision, Machine Learning, and Graphics presents a new approach to numerical analysis for modern computer scientists. Using examples from a broad base of computational tasks, including data processing, computational photography, and animation, the textbook introduces numerical modeling and algorithmic desig

High Performance Computing Systems and Applications Piscataway, NJ : IEEE Press

This book brings together the voices of leading experts in the frontiers of biostatistics, biomedicine, and the health sciences to discuss the statistical procedures, useful methods, and novel applications in biostatistics research. It also includes discussions of potential future directions of biomedicine and new statistical developments for health research, with the intent of stimulating research and fostering the interactions of scholars across health research related disciplines. Topics covered include: Health data analysis and applications to EHR data Clinical trials, FDR, and applications in health science Big network analytics and its applications in GWAS Survival analysis and functional data analysis Graphical modelling in genomic studies The book will be valuable to data scientists and statisticians who are working in biomedicine and health, other practitioners in the health sciences, and graduate students and researchers in biostatistics and health.

Current State and Future Perspectives IGI Global

Numerical analysis explains why numerical computations work - or fail. These are mathematical questions, and the book answers in kind, providing students with a very complete and sound presentation of the interface between mathematics and scientific computation. The book does not assume previous knowledge of numerical methods. It includes a large range of exercises, and will be suitable as a textbook at the advanced undergraduate level.

Spectral Methods in MATLAB Springer Science & Business Media

To make full use of the ever increasing hardware capabilities of modern com puters, it is necessary to speedily enhance the performance and reliability of the software as well, and often without having a suitable mathematical theory readily

available. In the handling of more and more complex real-life numerical problems in all sorts of applications, a modern object-oriented de sign and implementation of software tools has become a crucial component. The considerable challenges posed by the demand for efficient object-oriented software in all areas of scientific computing make it necessary to exchange ideas and experiences from as many different sources as possible. Motivated by the success of the first meeting of this kind in Norway in 1996, we decided to organize another International Workshop on Modern Software Tools for Scientific Computing, often referred to as SciTools'98. This workshop took place in Oslo, Norway, September 14-16, 1998. The ob jective was again to provide an open forum for exchange and discussion of modern, state-of-the-art software techniques applied to challenging numerical problems. The organization was undertaken jointly by the research institute SINTEF Applied Mathematics, the Departments of Mathematics and Infor matics at the University of Oslo, and the company Numerical Objects AS.

Krylov Methods for Nonsymmetric Linear Systems North Holland

An exposition of the interplay between the modelling of dynamic systems and the design of feedback controllers based on these models. The authors of individual chapters are some of the most renowned and authoritative figures in the fields of system identification and control design.

Second Edition Springer

Financial Risk Modelling and Portfolio Optimization with R, 2nd Edition Bernhard Pfaff, Invesco Global Asset Allocation, Germany A must have text for risk modelling and portfolio optimization using R. This book introduces the latest techniques advocated for measuring financial market risk and portfolio optimization, and provides a plethora of R code examples that enable the reader to replicate the results featured throughout the book. This edition has been extensively revised to include new topics on risk surfaces and probabilistic utility optimization as well as an extended introduction to R language. Financial Risk Modelling and Portfolio Optimization with R: Demonstrates techniques in modelling financial risks and applying portfolio optimization techniques as well as recent advances in the field. Introduces stylized facts, loss function and risk measures, conditional and unconditional modelling of risk; extreme value theory, generalized hyperbolic distribution, volatility modelling and concepts for capturing dependencies. Explores portfolio risk concepts and optimization with risk constraints. Is accompanied by a supporting website featuring examples and case studies in R. Includes updated list of R packages for enabling the reader to replicate the results in the book. Graduate and postgraduate students in finance, economics, risk management as well as practitioners in finance and portfolio optimization will find this book beneficial. It also serves well as an accompanying text in computer-lab classes and is therefore suitable for self-study.

Computational Methods in Physics SIAM

This handbook provides an up-to-date survey of current research topics and applications of time series analysis methods written by leading experts in their fields. It covers recent developments in univariate as well as bivariate and multivariate time series analysis

techniques ranging from physics' to life sciences' applications. Each chapter comprises both methodological aspects and applications to real world complex systems, such as the human brain or Earth's climate. Covering an exceptionally broad spectrum of topics, beginners, experts and practitioners who seek to understand the latest developments will profit from this handbook.
Tools and Mathematics SIAM
Numerical Linear Algebra is a concise, insightful, and elegant introduction to the field of numerical linear algebra.
ESREL 2015 SIAM
This book is intended to help advanced undergraduate, graduate, and postdoctoral students in their daily work by offering them a compendium of numerical methods. The choice of methods pays significant attention to error estimates, stability and convergence issues, as well as optimization of program execution speeds. Numerous examples are given throughout the chapters, followed by comprehensive end-of-chapter problems with a more pronounced physics background, while less stress is given to the explanation of individual algorithms. The readers are encouraged to develop a certain amount of skepticism and scrutiny instead of blindly following readily available commercial tools. The second edition has been enriched by a chapter on inverse problems dealing with the solution of integral equations, inverse Sturm-Liouville problems, as well as retrospective and recovery problems for partial differential equations. The revised text now includes an introduction to sparse matrix methods, the solution of matrix equations, and pseudospectra of matrices; it discusses the sparse Fourier, non-uniform Fourier and discrete wavelet transformations, the basics of non-linear regression and the Kolmogorov-Smirnov test; it demonstrates the key concepts in solving stiff differential equations and the asymptotics of Sturm-Liouville eigenvalues and eigenfunctions. Among other updates, it also presents the techniques of state-space reconstruction, methods to calculate the matrix exponential, generate random permutations and compute stable derivatives.
Modern Statistical Methods for Health Research Springer Nature
Numerical Linear AlgebraSIAM
Numerical Linear Algebra Techniques for Systems and Control CRC Press
The author captures the interplay between mathematics and the design of effective numerical algorithms.
Seamless R and C++ Integration with Rcpp SIAM
“This superb book is timely and is written with great attention paid to detail, particularly in its referencing of the literature. The book has a wonderful blend of theory and code (MATLAB®) so will be useful both to nonexperts and to experts in the field.” — Alan Laub, Professor, University of California, Los Angeles The only book devoted exclusively to matrix functions, this research monograph gives a thorough treatment of the theory of matrix functions and numerical methods for computing them. The author's elegant presentation focuses on the equivalent definitions of f(A) via the Jordan canonical form, polynomial interpolation, and the Cauchy integral formula, and features an emphasis on results of practical interest and an extensive collection of problems and solutions. Functions of Matrices: Theory and Computation is more than just a monograph on matrix functions; its wide-

ranging content—including an overview of applications, historical references, and miscellaneous results, tricks, and techniques with an f(A) connection—makes it useful as a general reference in numerical linear algebra.Other key features of the book include development of the theory of conditioning and properties of the Fréchet derivative; an emphasis on the Schur decomposition, the block Parlett recurrence, and judicious use of Padé approximants; the inclusion of new, unpublished research results and improved algorithms; a chapter devoted to the f(A)b problem; and a MATLAB® toolbox providing implementations of the key algorithms.Audience: This book is for specialists in numerical analysis and applied linear algebra as well as anyone wishing to learn about the theory of matrix functions and state of the art methods for computing them. It can be used for a graduate-level course on functions of matrices and is a suitable reference for an advanced course on applied or numerical linear algebra. It is also particularly well suited for self-study. Contents: List of Figures; List of Tables; Preface; Chapter 1: Theory of Matrix Functions; Chapter 2: Applications; Chapter 3: Conditioning; Chapter 4: Techniques for General Functions; Chapter 5: Matrix Sign Function; Chapter 6: Matrix Square Root; Chapter 7: Matrix pth Root; Chapter 8: The Polar Decomposition; Chapter 9: Schur-Parlett Algorithm; Chapter 10: Matrix Exponential; Chapter 11: Matrix Logarithm; Chapter 12: Matrix Cosine and Sine; Chapter 13: Function of Matrix Times Vector: f(A)b; Chapter 14: Miscellany; Appendix A: Notation; Appendix B: Background: Definitions and Useful Facts; Appendix C: Operation Counts; Appendix D: Matrix Function Toolbox; Appendix E: Solutions to Problems; Bibliography; Index.

Basic Environmental Data Analysis for Scientists and Engineers Springer

This book discusses the theory, method and application of non-Gaussian random vibration fatigue analysis and test. The main contents include statistical analysis method of non-Gaussian random vibration, modeling and simulation of non-Gaussian/non-stationary random vibration, response analysis under non-Gaussian base excitation, non-Gaussian random vibration fatigue life analysis, fatigue reliability evaluation of structural components under Gaussian/non-Gaussian random loadings, non-Gaussian random vibration accelerated test method and application cases. From this book, the readers can not only learn how to reproduce the non-Gaussian vibration environment actually experienced by the product, but also know how to evaluate the fatigue life and reliability of the structure under non-Gaussian random excitation.

Iterative Identification and Control CRC Press

This volume contains the Proceedings of the International Symposium on C- puting in Object-Oriented Parallel Environments (ISCOPE ’98), held at Santa 1 Fe, New Mexico, USA on December 8{11, 1998. ISCOPE is in its second year, and continues to grow both in attendance and in the diversity of the subjects covered. ISCOPE’97 and its predecessor conferences focused more narrowly on scienti c computing in the high-performance arena. ISCOPE ’98 retains this emphasis, but has broadened to include discrete-event simulation, mobile c- puting, and web-based metacomputing.

The ISCOPE ’98 Program Committee received 39 submissions, and acc- ted 10 (26%) as Regular Papers, based on their excellent content, maturity of development, and likelihood for widespread interest. These 10 are divided into three technical categories. Applications: The rst paper describes an approach to simulating advanced nuclear power reactor designs that incorporates multiple local solution - thods and a natural extension to parallel execution. The second paper disc- ses a Time Warp simulation kernel that is highly con gurable and portable. The third gives an account of the development of software for simulating high-intensity charged particle beams in linear particle accelerators, based on the POOMA framework, that shows performance considerably better than an HPF version, along with good parallel speedup.

Advanced R Solutions CRC Press

"This book confronts the problem of meaning by fusing together methods specific to different fields and exploring the computational efficiency and scalability of these methods"--Provided by publisher.

Functions of Matrices SIAM

Safety and Reliability of Complex Engineered Systems contains the Proceedings of the 25th European Safety and Reliability Conference, ESREL 2015, held 7-10 September 2015 in Zurich, Switzerland. It includes about 570 papers accepted for presentation at the conference. These contributions focus on theories and methods in the area of risk, safety and

Functions of Matrices SIAM

With ninety per cent of visible matter in the universe existing in the plasma state, an understanding of magnetohydrodynamics is essential for anyone looking to understand solar and astrophysical processes, from stars to accretion discs and galaxies; as well as laboratory applications focused on harnessing controlled fusion energy. This introduction to magnetohydrodynamics brings together the theory of plasma behavior with advanced topics including the applications of plasma physics to thermonuclear fusion and plasma-astrophysics. Topics covered include streaming and toroidal plasmas, nonlinear dynamics, modern computational techniques, incompressible plasma turbulence and extreme transonic and relativistic plasma flows. The numerical techniques needed to apply magnetohydrodynamics are explained, allowing the reader to move from theory to application and exploit the latest algorithmic advances. Bringing together two previous volumes: Principles of Magnetohydrodynamics and Advanced Magnetohydrodynamics, and completely updated with new examples, insights and applications, this volume constitutes a comprehensive reference for students and researchers interested in plasma physics, astrophysics and thermonuclear fusion.

Recent Theoretical Developments and Applications SIAM

Mathematics of Computing -- Numerical Analysis.

Numerical Mathematics and Advanced Applications ENUMATH 2015 John Wiley & Sons

This book is an exploration of tools and mathematics and issues in mathematics education related to tool use. The book has five parts. The first part reflects on doing a mathematical task with different tools, followed by a mathematician's

account of tool use in his work. The second considers prehistory and history: tools in the development from ape to human; tools and mathematics in the ancient world; tools for calculating; and tools in mathematics instruction. The third part opens with a broad review of technology and intellectual trends, circa 1970, and continues with three case studies of approaches in mathematics education and the place of tools in these approaches. The fourth part considers issues related to mathematics instructions: curriculum, assessment and policy; the calculator debate; mathematics in the real world; and teachers' use of technology. The final part looks to the future: task and tool design and new forms of activity via connectivity and computer games.