

Linear Algebra Unipg

This state-of-the-art survey offers a renewed and refreshing focus on the progress in evolutionary computation, in neural networks, and in fuzzy systems. The book presents the expertise and experiences of leading researchers spanning a diverse spectrum of computational intelligence in these areas. The result is a balanced contribution to the research area of computational intelligence that should serve the community not only as a survey and a reference, but also as an inspiration for the future advancement of the state of the art of the field. The 13 selected chapters originate from lectures and presentations given at the IEEE World Congress on Computational Intelligence, WCCI 2012, held in Brisbane, Australia, in June 2012.

Non-Additive Measure and Integral is the first systematic approach to the subject. Much of the additive theory (convergence theorems, Lebesgue spaces, representation theorems) is generalized, at least for submodular measures which are characterized by having a subadditive integral. The theory is of interest for applications to economic decision theory (decisions under risk and uncertainty), to statistics (including belief functions, fuzzy measures) to cooperative game theory, artificial intelligence, insurance, etc. Non-Additive Measure and Integral collects the results of scattered and often isolated approaches to non-additive measures and their integrals which originate in pure mathematics, potential theory, statistics, game theory, economic decision theory and other fields of application. It unifies, simplifies and generalizes known results and supplements the theory with new results, thus providing a sound basis for applications and further research in this growing field of increasing interest. It also contains fundamental results of sigma-additive and finitely additive measure and integration theory and sheds new light on additive theory. Non-Additive Measure and Integral employs distribution functions and quantile functions as basis tools, thus remaining close to the familiar language of probability theory. In addition to serving as an important reference, the book can be used as a mathematics textbook for graduate courses or seminars, containing many exercises to support or supplement the text. This Book of Abstracts is the main publication of the 68th Annual Meeting of the European Federation of Animal Science (EAAP). It contains abstracts of the invited papers and contributed presentations of the sessions of EAAP's eleven Commissions: Animal Genetics, Animal Nutrition, Animal Management and Health, Animal Physiology, Cattle Production, Sheep and Goat Production, Pig Production, Horse Production and

Livestock Farming Systems, Insects and Precision Livestock Farming.

This book gathers selected contributions presented at the INdAM Meeting Structured Matrices in Numerical Linear Algebra: Analysis, Algorithms and Applications, held in Cortona, Italy on September 4–8, 2017. Highlights cutting-edge research on Structured Matrix Analysis, it covers theoretical issues, computational aspects, and applications alike. The contributions, written by authors from the foremost international groups in the community, trace the main research lines and treat the main problems of current interest in this field. The book offers a valuable resource for all scholars who are interested in this topic, including researchers, PhD students and post-docs.

Analysis, Algorithms and Applications

Computational Science - ICCS 2003

9th International Conference, DLT 2005, Palermo, Italy, July 4–8, 2005, Proceedings

International Conference, Santander, Spain, June 20–23, 2011. Proceedings, Part III

Field Theory And Collective Phenomena

From Descriptive Statistics to Machine Learning

This authoritative book presents recent research results on nonlinear problems with lack of compactness. The topics covered include several nonlinear problems in the Euclidean setting as well as variational problems on manifolds. The combination of deep techniques in nonlinear analysis with applications to a variety of problems make this work an essential source of information for researchers and graduate students working in analysis and PDE's.

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.

This volume contains both invited lectures and contributed talks presented at the meeting on Total Positivity and its Applications held at the guest house of the University of Zaragoza in Jaca, Spain, during the week of September 26–30, 1994. There were present at the meeting almost fifty researchers from fourteen countries. Their interest in the subject of Total Positivity made for a stimulating and fruitful exchange of scientific information. Interest to participate in the meeting exceeded our expectations. Regrettably, budgetary constraints forced us to restrict the number of attendees. Professor S. Karlin, of Stanford University, who planned to attend the meeting had to cancel his participation at the last moment. Nonetheless, his almost universal spiritual presence energized and inspired all of us in Jaca. More than anyone, he influenced the

content, style and quality of the presentations given at the meeting. Every article in these Proceedings (except some by Karlin himself) references his influential treatise Total Positivity, Volume I, Stanford University Press, 1968. Since its appearance, this book has intrigued and inspired the minds of many researchers (one of us, in his formative years, read the galley proofs and the other of us first doubted its value but then later became its totally committed disciple). All of us present at the meeting encourage Professor Karlin to return to the task of completing the anxiously awaited Volume 11 of Total Positivity.

This book is a tribute to Professor Ewa Orłowska, a Polish logician who was celebrating the 60th year of her scientific career in 2017. It offers a collection of contributed papers by different authors and covers the most important areas of her research. Prof. Orłowska made significant contributions to many fields of logic, such as proof theory, algebraic methods in logic and knowledge representation, and her work has been published in 3 monographs and over 100 articles in internationally acclaimed journals and conference proceedings. The book also includes Prof. Orłowska's autobiography, bibliography and a dialogue between her and the editors of the volume, as well as contributors' biographical notes, and is suitable for scholars and students of logic who are interested in understanding more about Prof. Orłowska's work.

Bulletin - Institute of Mathematical Statistics

Computational Complexity

Geometric Science of Information

Abstracts of Papers Presented to the American Mathematical Society

Theory of Charges

Journal of Physics A

The growing capabilities in generating and collecting data has risen an urgent need of new techniques and tools in order to analyze, classify and summarize statistical information, as well as to discover and characterize trends, and to automatically bag anomalies. This volume provides the latest advances in data analysis methods for multidimensional data which can present a complex structure: The book offers a selection of papers presented at the first Joint Meeting of the Société Francophone de Classification and the Classification and Data Analysis Group of the Italian Statistical Society. Special attention is paid to new methodological contributions from both the theoretical and the applicative point of views, in the fields of Clustering, Classification, Time Series Analysis, Multidimensional Data Analysis, Knowledge Discovery from Large Datasets, Spatial Statistics.

This book has two main purposes. On the one hand, it provides a concise and systematic development of the theory of lower previsions, based on the concept of acceptability, in spirit of the work of Williams and Walley. On the other hand, it also extends this theory to deal with unbounded quantities, which abound in practical applications. Following Williams, we start out with sets of acceptable gambles. From those, we derive rationality criteria---avoiding sure loss and coherence---and inference methods---natural extension---for (unconditional) lower previsions. We then proceed to study various aspects of the resulting theory, including the

concept of expectation (linear previsions), limits, vacuous models, classical propositional logic, lower oscillations, and monotone convergence. We discuss n -monotonicity for lower previsions, and relate lower previsions with Choquet integration, belief functions, random sets, possibility measures, various integrals, symmetry, and representation theorems based on the Bishop-De Leeuw theorem. Next, we extend the framework of sets of acceptable gambles to consider also unbounded quantities. As before, we again derive rationality criteria and inference methods for lower previsions, this time also allowing for conditioning. We apply this theory to construct extensions of lower previsions from bounded random quantities to a larger set of random quantities, based on ideas borrowed from the theory of Dunford integration. A first step is to extend a lower prevision to random quantities that are bounded on the complement of a null set (essentially bounded random quantities). This extension is achieved by a natural extension procedure that can be motivated by a rationality axiom stating that adding null random quantities does not affect acceptability. In a further step, we approximate unbounded random quantities by a sequences of bounded ones, and, in essence, we identify those for which the induced lower prevision limit does not depend on the details of the approximation. We call those random quantities 'previsible'. We study previsibility by cut sequences, and arrive at a simple sufficient condition. For the 2-monotone case, we establish a Choquet integral representation for the extension. For the general case, we prove that the extension can always be written as an envelope of Dunford integrals. We end with some examples of the theory.

This needs-based book summarizes important correlations about interpretation of structures — i.r. frequencies (both theoretical and experimental) from a vast amount of data available in a number of excellent encyclopedic books. It contains a short elementary introduction on the calculation methodology for Normal Co-ordinate Analysis that will aid students in assigning a particular band to a functional group or normal mode. Statistical correlations of the i.r.-frequency data are dealt with in a number of examples not found in most other books. This book also details various spectroscopies with different optics and strategies for analyzing the spectron. Students will also get ample practice with a comprehensive section containing more than 350 problems and worked-out solutions.

Theory of Charges

Mathematical and general

In Honor of Haïm Brezis

Proceedings of the 7th Conference of the Classification and Data Analysis Group of the Italian Statistical Society, Catania, September 9 - 11, 2009

Dynamics of Continuous, Discrete & Impulsive Systems

An Introduction to Differentiable Manifolds and Riemannian Geometry,

Revised

New Perspectives in Statistical Modeling and Data Analysis

Most coding theory experts date the origin of the subject with the 1948 publication of A Mathematical Theory of Communication by Claude Shannon. Since then, coding theory has grown into a discipline with many practical applications (antennas, networks, memories), requiring various mathematical techniques, from commutative algebra, to semi-definite programming, to algebraic geometry. Most topics covered in the Concise Encyclopedia of Coding Theory are presented in short sections at an introductory level and progress from basic to advanced level, with definitions, examples, and many references. The book is divided into three parts: Part I fundamentals: cyclic codes, skew cyclic codes, quasi-cyclic codes, self-dual codes, codes and designs, codes over rings, convolutional codes, performance bounds Part II families: AG codes, group algebra codes, few-weight codes, Boolean function codes, codes over graphs Part III applications: alternative metrics, algorithmic techniques, interpolation decoding, pseudo-random sequences, lattices, quantum coding, space-time codes, network coding, distributed storage, secret-sharing, and code-based-cryptography. Features Suitable for students and researchers in a wide range of mathematical disciplines Contains many examples and references Most topics take the reader to the frontiers of research

This book constitutes the proceedings of the 5th International Conference on Geometric Science of Information, GSI 2021, held in Paris, France, in July 2021. The 98 papers presented in this volume were carefully reviewed and selected from 125 submissions. They cover all the main topics and highlights in the domain of geometric science of information, including information geometry manifolds of structured data/information and their advanced applications. The papers are organized in the following topics: Probability and statistics on Riemannian Manifolds; sub-Riemannian geometry and neuromathematics; shapes spaces; geometry of quantum states; geometric and structure preserving discretizations; information geometry in physics; Lie group machine learning; geometric and symplectic methods for hydrodynamical models; harmonic analysis on Lie groups; statistical manifold and Hessian information geometry; geometric mechanics; deformed entropy, cross-entropy, and relative entropy; transformation information geometry;

statistics, information and topology; geometric deep learning; topological and geometrical structures in neurosciences; computational information geometry; manifold and optimization; divergence statistics; optimal transport and learning; and geometric structures in thermodynamics and statistical physics.

An Introduction to Differentiable Manifolds and Riemannian Geometry

The four-volume set LNCS 2657, LNCS 2658, LNCS 2659, and LNCS 2660 constitutes the refereed proceedings of the Third International Conference on Computational Science, ICCS 2003, held concurrently in Melbourne, Australia and in St. Petersburg, Russia in June 2003. The four volumes present more than 460 reviewed contributed and invited papers and span the whole range of computational science, from foundational issues in computer science and algorithmic mathematics to advanced applications in virtually all application fields making use of computational techniques. These proceedings give a unique account of recent results in the field.

Developments in Language Theory

Ewa Orłowska on Relational Methods in Logic and Computer Science

Optimization Algorithms on Matrix Manifolds

Tallinn, Estonia, 28 August - 1 September 2017

Kybernetika

Concise Encyclopedia of Coding Theory

New and classical results in computational complexity, including interactive proofs, PCP, derandomization, and quantum computation. Ideal for graduate students.

The five-volume set LNCS 7971-7975 constitutes the refereed proceedings of the 13th International Conference on Computational Science and Its Applications, ICCSA 2013, held in Ho Chi Minh City, Vietnam in June 2013. The 248 revised papers presented in five tracks and 33 special sessions and workshops were carefully reviewed and selected. The 46 papers included in the five general tracks are organized in the following topical sections: computational methods, algorithms and scientific applications; high-performance computing and networks; geometric modeling, graphics and visualization; advanced and emerging applications; and information systems and technologies. The 202 papers presented in special sessions and workshops cover a wide range of topics in computational sciences ranging from computational science technologies to specific areas of computational sciences such as computer graphics and virtual reality.

This volume provides recent research results in data analysis, classification and multivariate statistics and highlights perspectives for new scientific developments within these areas. Particular attention is devoted to methodological issues in clustering, statistical modeling and data mining. The volume also contains significant contributions to a wide range of applications such as finance, marketing, and social sciences. The papers in this volume were first presented at the 7th Conference of the Classification and Data Analysis Group (ClaDAG) of the Italian Statistical Society, held at the University of Catania, Italy.

This book is the definitive treatment of the theory of polynomials in a complex variable with matrix coefficients. Basic matrix theory can be viewed as the study of the special case of polynomials of first degree; the theory developed in Matrix Polynomials is a natural extension of this case to polynomials of higher degree. It has applications in many areas, such as differential equations, systems theory, the Wiener-Hopf technique, mechanics and vibrations, and numerical analysis. Although there have been significant advances in some quarters, this work remains the only systematic development of the theory of matrix polynomials. The book is appropriate for students, instructors, and researchers in linear algebra, operator theory, differential equations, systems theory, and numerical analysis. Its contents are accessible to readers who have had undergraduate-level courses in linear algebra and complex analysis.

13th International Conference, ICCSA 2013, Ho Chi Minh City, Vietnam, June 24-27, 2013, Proceedings, Part V

Difference Sets, Polynomials, Pseudorandomness and Applications

Non-Additive Measure and Integral

Advances in Computational Intelligence

Uncertainty in Knowledge-Based Systems

Information Processing and Management of Uncertainty in Knowledge-Based Systems

Combinatorics and finite fields are of great importance in modern applications such as in the analysis of algorithms, in information and communication theory, and in signal processing and coding theory. This book contains survey articles on topics such as difference sets, polynomials, and pseudorandomness.

Many problems in the sciences and engineering can be rephrased as optimization problems on matrix search spaces endowed with a so-called manifold structure. This book shows how to exploit the special structure of such problems to develop efficient numerical algorithms. It places careful emphasis on both the numerical formulation of the algorithm and its differential geometric abstraction--illustrating how good algorithms draw equally from the insights of differential geometry, optimization, and numerical analysis. Two more theoretical chapters provide readers with the background in differential geometry necessary to algorithmic development. In the other chapters, several well-known optimization methods such as steepest descent and conjugate gradients are generalized to abstract manifolds. The book provides a generic development of each of these methods, building upon the material of the geometric chapters. It then guides readers through the calculations that turn these geometrically formulated methods into concrete numerical algorithms. The state-of-the-art algorithms given as

examples are competitive with the best existing algorithms for a selection of eigenspace problems in numerical linear algebra. Optimization Algorithms on Matrix Manifolds offers techniques with broad applications in linear algebra, signal processing, data mining, computer vision, and statistical analysis. It can serve as a graduate-level textbook and will be of interest to applied mathematicians, engineers, and computer scientists.

The second edition of An Introduction to Differentiable Manifolds and Riemannian Geometry, Revised has sold over 6,000 copies since publication in 1986 and this revision will make it even more useful. This is the only book available that is approachable by "beginners" in this subject. It has become an essential introduction to the subject for mathematics students, engineers, physicists, and economists who need to learn how to apply these vital methods. It is also the only book that thoroughly reviews certain areas of advanced calculus that are necessary to understand the subject. Line and surface integrals Divergence and curl of vector fields

This three volume set (CCIS 1237-1239) constitutes the proceedings of the 18th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems, IPMU 2020, in June 2020. The conference was scheduled to take place in Lisbon, Portugal, at University of Lisbon, but due to COVID-19 pandemic it was held virtually. The 173 papers were carefully reviewed and selected from 213 submissions. The papers are organized in topical sections: homage to Enrique Ruspini; invited talks; foundations and mathematics; decision making, preferences and votes; optimization and uncertainty; games; real world applications; knowledge processing and creation; machine learning I; machine learning II; XAI; image processing; temporal data processing; text analysis and processing; fuzzy interval analysis; theoretical and applied aspects of imprecise probabilities; similarities in artificial intelligence; belief function theory and its applications; aggregation: theory and practice; aggregation: pre-aggregation functions and other generalizations of monotonicity; aggregation: aggregation of different data structures; fuzzy methods in data mining and knowledge discovery; computational intelligence for logistics and transportation problems; fuzzy implication functions; soft methods in statistics and data analysis; image understanding and explainable AI; fuzzy and generalized quantifier theory; mathematical methods towards dealing with uncertainty in applied sciences; statistical image processing and analysis, with applications in neuroimaging; interval uncertainty; discrete models and computational intelligence; current techniques to model, process and describe time series; mathematical fuzzy logic and graded reasoning models; formal concept analysis, rough sets, general operators and related topics; computational intelligence methods in information modelling, representation and processing.

Applications & algorithms

Book of Abstracts of the 68th Annual Meeting of the European Federation of Animal Science Combined Membership List of the American Mathematical Society, Mathematical Association of America, and the Society for Industrial and Applied Mathematics

A Study of Finitely Additive Measures

14th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems, IPMU 2012, Catania, Italy, July 9 - 13, 2012. Proceedings, Part IV Perspectives in Nonlinear Partial Differential Equations

Lists for 19 include the Mathematical Association of America, and 1955- also the Society for Industrial and Applied Mathematics.

These four volumes (CCIS 297, 298, 299, 300) constitute the proceedings of the 14th International Conference on

Information Processing and Management of Uncertainty in Knowledge-Based Systems, IPMU 2012, held in Catania, Italy, in July 2012. The 258 revised full papers presented together with six invited talks were carefully reviewed and selected from numerous submissions. The papers are organized in topical sections on fuzzy machine learning and on-line modeling; computing with words and decision making; soft computing in computer vision; rough sets and complex data analysis: theory and applications; intelligent databases and information system; information fusion systems; philosophical and methodological aspects of soft computing; basic issues in rough sets; 40th anniversary of the measures of fuzziness; SPS11 uncertainty in profiling systems and applications; handling uncertainty with copulas; formal methods to deal with uncertainty of many-valued events; linguistic summarization and description of data; fuzzy implications: theory and applications; sensing and data mining for teaching and learning; theory and applications of intuitionistic fuzzy sets; approximate aspects of data mining and database analytics; fuzzy numbers and their applications; information processing and management of uncertainty in knowledge-based systems; aggregation functions; imprecise probabilities; probabilistic graphical models with imprecision: theory and applications; belief function theory: basics and/or applications; fuzzy uncertainty in economics and business; new trends in De Finetti's approach; fuzzy measures and integrals; multi criteria decision making; uncertainty in privacy and security; uncertainty in the spirit of Pietro Benvenuti; coopetition; game theory; probabilistic approach.

This introduction to computational geometry focuses on algorithms. Motivation is provided from the application areas as all techniques are related to particular applications in robotics, graphics, CAD/CAM, and geographic information systems. Modern insights in computational geometry are used to provide solutions that are both efficient and easy to understand and implement.

The five-volume set LNCS 6782 - 6786 constitutes the refereed proceedings of the International Conference on Computational Science and Its Applications, ICCSA 2011, held in Santander, Spain, in June 2011. The five volumes contain papers presenting a wealth of original research

results in the field of computational science, from foundational issues in computer science and mathematics to advanced applications in virtually all sciences making use of computational techniques. The topics of the fully refereed papers are structured according to the five major conference themes: geographical analysis, urban modeling, spatial statistics; cities, technologies and planning; computational geometry and applications; computer aided modeling, simulation, and analysis; and mobile communications.

18th International Conference, IPMU 2020, Lisbon, Portugal, June 15–19, 2020, Proceedings, Part I

Matrix Polynomials

Bulletin

Classification and Multivariate Analysis for Complex Data Structures

Advances in Computational Intelligence, Part IV

This book constitutes the refereed proceedings of the 9th International Conference on Developments in Language Theory, DLT 2005, held in Palermo, Italy in July 2005. The 29 revised full papers presented together with 5 invited papers were carefully reviewed and selected from 73 submissions.

All important issues in language theory are addressed including grammars, acceptors, and transducers for strings, trees, graphs, and arrays; efficient text algorithms; algebraic theories for automata and languages; variable-length codes; symbolic dynamics; decision problems; relations to complexity theory and logic; picture description and analysis; cryptography; concurrency; DNA computing; and quantum computing.

Computational Science – ICCS 2003 International Conference, Melbourne, Australia and St. Petersburg, Russia, June 2–4, 2003. Proceedings Springer Science & Business Media

In celebration of Haim Brezis's 60th birthday, a conference was held at the Ecole Polytechnique in Paris, with a program testifying to Brezis's wide-ranging influence on nonlinear analysis and partial differential equations. The articles in this volume are primarily from that conference. They present a rare view of the state of the art of many aspects of nonlinear PDEs, as well as describe new directions that are being opened up in this field. The articles, written by mathematicians at the center of current developments,

provide somewhat more personal views of the important developments and challenges.

This textbook introduces the use of Python programming for exploring and modelling data in the field of Earth Sciences. It drives the reader from his very first steps with Python, like setting up the environment and starting writing the first lines of codes, to proficient use in visualizing, analyzing, and modelling data in the field of Earth Science. Each chapter contains explicative examples of code, and each script is commented in detail. The book is minded for very beginners in Python programming, and it can be used in teaching courses at master or PhD levels. Also, Early careers and experienced researchers who would like to start learning Python programming for the solution of geological problems will benefit the reading of the book.

An Introduction to Differentiable Manifolds and Riemannian Geometry

Structured Matrices in Numerical Linear Algebra

Combinatorics and Finite Fields

Algorithms and Applications

Numerical Solution of Algebraic Riccati Equations

International Conference, Melbourne, Australia and St. Petersburg, Russia, June 2-4, 2003. Proceedings