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## Discrete Applied Mathematics Journal

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Strange Functions in Real Analysis Springer Science & Business Media  
Explores regular structures in graphs and contingency tables by spectral theory and statistical methods This book bridges the gap between graph theory and statistics by giving answers to the demanding questions which arise when statisticians are confronted with large weighted graphs or rectangular arrays. Classical and modern statistical methods applicable to biological, social, communication networks, or microarrays are presented together with the theoretical background and proofs. This book is suitable for a one-semester course for graduate students in data mining, multivariate statistics, or applied graph theory; but by skipping the proofs, the algorithms can also be used by specialists who just want to retrieve information from their data when analysing communication, social, or biological networks. Spectral Clustering and Biclustering: Provides a unified treatment for edge-weighted graphs and contingency tables via methods of multivariate statistical analysis (factoring, clustering, and biclustering). Uses spectral embedding and relaxation to estimate multiway cuts of edge-weighted graphs and bicuts of contingency tables. Goes beyond the expanders by describing the structure of dense graphs with a small spectral gap via the structural eigenvalues and eigen-subspaces of the normalized modularity matrix. Treats graphs like statistical data by combining methods of graph theory and statistics. Establishes a common outline structure for the contents of each algorithm, applicable to networks and microarrays, with unified notions and

principles.

Inverse Problems with Applications in Science and Engineering Springer Nature

The present reprint contains twelve papers published in the Special Issue "Advances in Discrete Applied Mathematics and Graph Theory, 2021" of the MDPI Mathematics journal, which cover a wide range of topics connected to the theory and applications of Graph Theory and Discrete Applied Mathematics. The focus of the majority of papers is on recent advances in graph theory and applications in chemical graph theory. In particular, the topics studied include bipartite and multipartite Ramsey numbers, graph coloring and chromatic numbers, several varieties of domination (Double Roman, Quasi-Total Roman, Total 3-Roman) and two graph indices of interest in chemical graph theory (Sombor index, generalized ABC index), as well as hyperspaces of graphs and local inclusive distance vertex irregular graphs.

**Discrete Inverse Problems** Springer Science & Business Media

This book defines and studies a combinatorial object called the pedigree and develops the theory for optimising a linear function over the convex hull of pedigrees (the Pedigree polytope). A strongly polynomial algorithm implementing the framework given in the book for checking membership in the pedigree polytope is a major contribution. This book challenges the popularly held belief in computer science that a problem included in the NP-complete class may not have a polynomial algorithm to solve. By showing STSP has a polynomial algorithm, this book settles the P vs NP question. This book has illustrative examples, figures, and easily accessible proofs for showing this unexpected result. This book introduces novel constructions and ideas previously not used in the literature. Another interesting feature of this book is it uses basic max-flow and linear multicommodity flow algorithms and concepts in these proofs establishing efficient membership checking for the pedigree polytope. Chapters 3-7 can be adopted to give a course on Efficient Combinatorial Optimization. This book is the culmination of the author's research that started in 1982 through a presentation on a new formulation of STSP at the XIth International Symposium on Mathematical Programming at Bonn.

## Algorithms and Discrete Applied Mathematics Springer Nature

Assignment Problems is a useful tool for researchers, practitioners and graduate students. In 10 self-contained chapters, it provides a comprehensive treatment of assignment problems from their conceptual beginnings through present-day theoretical, algorithmic and practical developments. The topics covered include bipartite matching algorithms, linear assignment problems, quadratic assignment problems, multi-index assignment problems and many variations of these. Researchers will benefit from the detailed exposition of theory and algorithms related to assignment problems, including the basic linear sum assignment problem and its variations.

Practitioners will learn about practical applications of the methods, the performance of exact and heuristic algorithms, and software options. This book also can serve as a text for advanced courses in areas related to discrete mathematics and combinatorial optimisation. The revised reprint provides details on a recent discovery related to one of Jacobi's results, new material on inverse assignment problems and quadratic assignment problems, and an updated bibliography.

## Boolean Models and Methods in Mathematics, Computer Science, and Engineering ScholarlyEditions

Combinatorial optimization is a multidisciplinary scientific area, lying in the interface of three major scientific domains: mathematics, theoretical computer science and management. The three volumes of the Combinatorial Optimization series aim to cover a wide range of topics in this area. These topics also deal with fundamental notions and approaches as with several classical applications of combinatorial optimization. Concepts of Combinatorial Optimization, is divided into three parts: - On the complexity of combinatorial optimization problems, presenting basics about worst-case and randomized complexity; - Classical solution methods, presenting the two most-known methods for solving hard combinatorial optimization problems, that are Branch-and-Bound and Dynamic Programming; - Elements from mathematical programming, presenting fundamentals from mathematical programming based methods that are in the heart of Operations Research since the origins of this field.

## Computational Molecular Biology Springer Nature

This book constitutes the proceedings of the 6th International Conference on Algorithms and Discrete Applied Mathematics, CALDAM 2020, held in Hyderabad, India, in February 2020. The 38 papers presented together with 2 invited talks in this volume were carefully reviewed and selected from 102 submissions. The papers are organized in topical sections on graph algorithms, graph theory, combinatorial optimization, distributed algorithms, combinatorial algorithms, and computational complexity.

## Algorithms and Discrete Applied Mathematics Springer

One of the most important subjects for all engineers and scientists is probability and statistics. This book presents the basics of the essential topics in probability and statistics from a rigorous standpoint. The basics of probability underlying all statistics is presented first and then we cover the essential topics in statistics, confidence intervals, hypothesis testing, and linear regression. This book is suitable for any engineer or scientist who is comfortable with calculus and is meant to be covered in a one-semester format.

## Assignment Problems, Revised Reprint Cambridge University Press

This book collects the refereed proceedings of the First International Conference on Algorithms and Discrete Applied Mathematics, CALDAM 2015, held in Kanpur, India, in February 2015. The volume contains 26 full revised papers from 58 submissions along with 2 invited talks presented at the conference. The workshop covered a diverse range of topics on algorithms and discrete mathematics, including computational geometry, algorithms including approximation algorithms, graph theory and computational complexity.

## Combinatorics of Set Partitions CRC Press

In recent years, applied mathematics has been used in all novel disciplines of scientific development. Advances in Applied Mathematical Problems summarizes interdisciplinary work within the field of applied mathematics. The topics discussed in the book include: • Similarity Solutions of Spherical Shock Waves in a Self-Gravitating Ideal

Gas • Dual Solutions for Finite Element Analysis of Unsteady Hydromagnetic Stagnation Point Flow of Water Nanofluid Generated by Stretching Sheet • Multiparametric modeling of carbon cycle in temperate wetlands for regional climate change analysis using satellite data • An Intelligent Neuro Fuzzy System for Pattern Classification • Fuzzy inventory model with demand, deterioration and inflation: a comparative study through NGTFN and CNTFN • Summability and its application for the stability of the system • Design Of Manufacturing, Control, And Automation Systems • SEIR - Application for Crop through Water and Soil Texture • Advances in radial basis functions • Modeling For Time Period Of Natural Frequency For Non-Homogeneous Square Plate With Variable Thickness And Temperature Effect • A Study On Metric Fixed Point Theorems Satisfying Integral Type Contractions • Objective Function — In Radiometric Studies — Application to Agrs Surveys Associated With Radon • Modelling Kernel Function in Black body Radiation Inversion

## Pedigree Polytopes SIAM

This book was first published in 2003. Combinatorica, an extension to the popular computer algebra system Mathematica®, is the most comprehensive software available for teaching and research applications of discrete mathematics, particularly combinatorics and graph theory. This book is the definitive reference/user's guide to Combinatorica, with examples of all 450 Combinatorica functions in action, along with the associated mathematical and algorithmic theory. The authors cover classical and advanced topics on the most important combinatorial objects: permutations, subsets, partitions, and Young tableaux, as well as all important areas of graph theory: graph construction operations, invariants, embeddings, and algorithmic graph theory. In addition to being a research tool, Combinatorica makes discrete mathematics accessible in new and exciting ways to a wide variety of people, by encouraging computational experimentation and visualization. The book contains no formal proofs, but enough discussion to understand and appreciate all the algorithms and theorems it contains.

## Handbook of Discrete and Combinatorial Mathematics CRC Press

Advances in discrete mathematics are presented in this book with applications in theoretical mathematics and interdisciplinary research. Each chapter presents new methods and techniques by leading experts. Unifying interdisciplinary applications, problems, and approaches of discrete mathematics, this book connects topics in graph theory, combinatorics, number theory, cryptography, dynamical systems, finance, optimization, and game theory. Graduate students and researchers in optimization, mathematics, computer science, economics, and physics will find the wide range of interdisciplinary topics, methods, and applications covered in this book engaging and useful.

## Discrete Mathematics and Applications Springer Science & Business Media

The contributions by leading experts in this book focus on a variety of topics of current interest related to information-based complexity, ranging from function approximation, numerical integration, numerical methods for the sphere, and algorithms with random information, to Bayesian probabilistic numerical methods and numerical methods for stochastic differential equations.

## The Quarterly Journal of Pure and Applied Mathematics Morgan & Claypool Publishers

Focusing on a very active area of mathematical research in the last decade, Combinatorics of Set Partitions presents methods used in the combinatorics of pattern avoidance and pattern enumeration in set partitions. Designed for students and researchers in discrete mathematics, the book is a one-stop reference on the results and research activities

## A Journey Through Discrete Mathematics Gulf Professional Publishing

The main topics in this introductory text to discrete geometry include basics on convex sets, convex polytopes and hyperplane arrangements, combinatorial complexity of geometric configurations, intersection patterns and transversals of convex sets, geometric Ramsey-type results, and embeddings of finite metric spaces into normed spaces. In each area, the text explains several key results and methods.

## Algorithms and Discrete Applied Mathematics Cambridge University Press

Driven by the advancement of industrial mathematics and the need for impact case studies, Inverse Problems with

Applications in Science and Engineering thoroughly examines the state-of-the-art of some representative classes of inverse and ill-posed problems for partial differential equations (PDEs). The natural practical applications of this examination arise in heat transfer, electrostatics, porous media, acoustics, fluid and solid mechanics — all of which are addressed in this text. Features: Covers all types of PDEs — namely, elliptic (Laplace's, Helmholtz, modified Helmholtz, biharmonic and Stokes), parabolic (heat, convection, reaction and diffusion) and hyperbolic (wave). Excellent reference for post-graduates and researchers in mathematics, engineering and any other scientific discipline that deals with inverse problems. Contains both theory and numerical algorithms for solving all types of inverse and ill-posed problems.

Issues in Applied Mathematics: 2013 Edition Springer Nature

The book first describes connections between some basic problems and techniques of combinatorics and statistical physics. The discrete mathematics and physics terminology are related to each other. Using the established connections, some exciting activities in one field are shown from a perspective of the other field. The purpose of the book is to emphasize these interactions as a strong and successful tool. In fact, this attitude has been a strong trend in both research communities recently. It also naturally leads to many open problems, some of which seem to be basic. Hopefully, this book will help making these exciting problems attractive to advanced students and researchers.

Algebraic Combinatorics Springer Science & Business Media

This book constitutes the proceedings of the 7th International Conference on Algorithms and Discrete Applied Mathematics, CALDAM 2021, which was held in Rupnagar, India, during February 11-13, 2021.

The 39 papers presented in this volume were carefully reviewed and selected from 82 submissions. The papers were organized in topical sections named: approximation algorithms; parameterized algorithms; computational geometry; graph theory; combinatorics and algorithms; graph algorithms; and computational complexity.

Probability and Statistics for STEM Springer

Issues in Applied Mathematics / 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Applied Mathematics. The editors have built Issues in Applied Mathematics: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Applied Mathematics in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Applied Mathematics: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Issues in Logic, Operations, and Computational Mathematics and Geometry: 2011 Edition CRC Press

In recent years, many new techniques have emerged in the mathematical theory of discrete optimization that have proven to be effective in solving a number of hard problems. This book presents these recent advances, particularly those that arise from algebraic geometry, commutative algebra, convex and discrete geometry, generating functions, and other tools normally considered outside of the standard curriculum in optimization. These new techniques, all of which are presented with minimal prerequisites, provide a transition from linear to nonlinear discrete optimization. This book can be used as a textbook for advanced undergraduates or first-year graduate students in mathematics, computer science or operations research. It is also appropriate for mathematicians, engineers, and scientists engaged in computation who wish to gain a deeper understanding of how and why algorithms work.

Advances in Applied Mathematical Analysis and Applications John Wiley & Sons

This book describes highly applicable mathematics without using calculus or limits in general. The study agrees with the opinion that the traditional calculus/analysis is not necessarily the only proper grounding for academics who wish to apply mathematics. The choice of topics is based on a desire to present those facets of mathematics which will be

useful to economists and social/behavioral scientists. The volume is divided into seven chapters. Chapter I presents a brief review of the solution of systems of linear equations by the use of matrices. Chapter III introduces the theory of probability. The rest of the book deals with new developments in mathematics such as linear and dynamic programming, the theory of networks and the theory of games. These developments are generally recognized as the most important field in the 'new mathematics' and they also have specific applications in the management sciences.