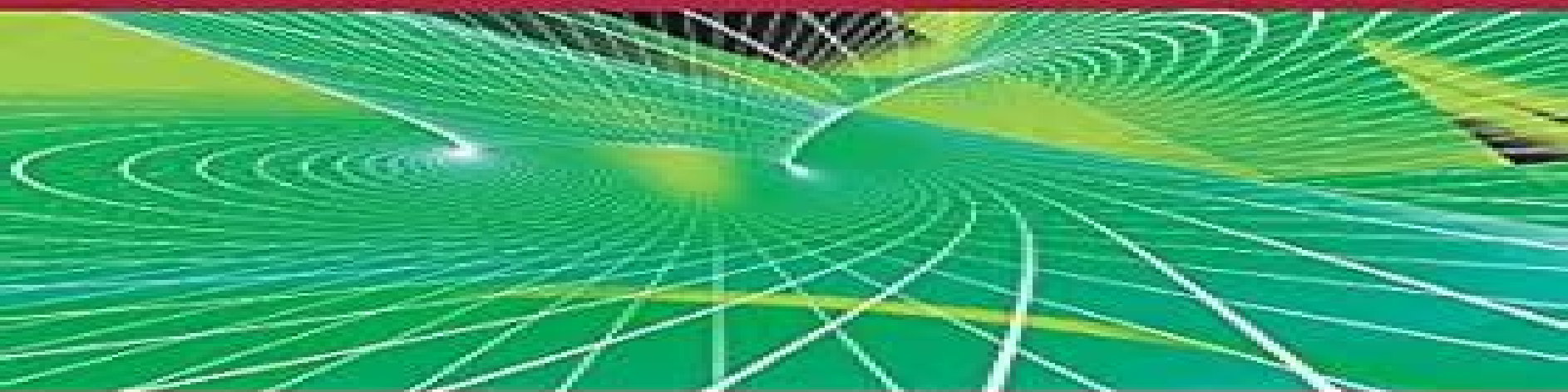


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network optimization simulation and system dynamics heuristics metaheuristics artificial intelligence analytics and also multiple criteria decision making The number and the increasing size of the problems arising in real life require mathematical models and solution methods adequate to their complexity There has also been increasing research interest in Big Data and related challenges These challenges can be recognized in many fields and systems which have a significant impact on our way of living design management and control of industrial production of goods and services transportation planning and traffic management in urban and regional areas energy production and exploitation natural resources and environment protection homeland security and critical infrastructure protection development of advanced information and communication technologies The chapters in this book examine how to deal with new and emerging practical problems arising in these different fields through the presented methodologies and their applications The chapter topics are applicable for researchers and practitioners working in these areas but also for the operations research community The contributions were presented during the international conference Optimization and Decision Science ODS2017 held at Hilton Sorrento Palace Conference Center Sorrento Italy September 4 7 2017 ODS 2017 was organized by AIRO Italian Operations Research Society in cooperation with DIETI Department of Electrical Engineering and Information Technology of University Federico II of Naples

Progress in Industrial Mathematics: Success Stories Manuel Cruz, Carlos Parés, Peregrina

Quintela, 2021-03-19 This book presents a panorama about the recent progress of industrial mathematics from the point of view of both industrials and researchers The chapters correspond to a selection of the contributions presented in the Industry Day and in the Minisymposium EU MATHS IN Success Stories of Applications of Mathematics to Industry organized in the framework of the International Conference ICIAM 2019 held in Valencia Spain on July 15 19 2019 In the Industry Day included for the first time in this series of Conferences representatives of companies from different countries and several sectors presented their view about the benefits regarding the usage of mathematical tools and or collaboration with mathematicians The contributions of this special session were addressed to industry people Minisymposium contributions detailed some collaborations between mathematicians and industrials that led to real benefits in several European companies All the speakers were affiliated in some of the European National Networks that constitute the European Service Network of Mathematics for Industry and Innovation EU MATHS IN

Parallel and Distributed Computing, Applications and Technologies Yupeng Li, Yong Zhang, Jianliang Xu, 2025-05-02 This book constitutes the refereed proceedings of the 25th International Conference on Parallel and Distributed Computing Applications and Technologies PDCAT 2024 held in Hong Kong China during December 14 16 2024 The 47 full papers and 8 short papers included in this book were carefully reviewed and selected from 114 submissions They focus on advances in parallel and distributed computing including parallel architectures algorithms and programming techniques

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offers a comprehensive introduction to the role of randomization and probabilistic techniques in modern computer science. Newly added chapters and sections cover topics including normal distributions, sample complexity, VC dimension, Rademacher complexity, power laws and related distributions, cuckoo hashing and the Lovasz Local Lemma. Material relevant to machine learning and big data analysis enables students to learn modern techniques and applications. Among the many new exercises and examples are programming related exercises that provide students with excellent training in solving relevant problems. This book provides an indispensable teaching tool to accompany a one or two semester course for advanced undergraduate students in computer science and applied mathematics.

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Linear Integer Programming Elias Munapo, Santosh Kumar, 2021-12-06. This book presents the state of the art methods in Linear Integer Programming including some new algorithms and heuristic methods developed by the authors in recent years. Topics as Characteristic equation, CE application of CE to bi objective and multi objective problems, Binary integer problems, Mixed integer models, Knapsack models, Complexity reduction, Feasible space reduction, Random search, Connected graph are also treated.

Fat-Tailed Distributions Roger M. Cooke, Daan Nieboer, Jolanta Misiewicz, 2014-12-03. This title is written for the numerate nonspecialist and hopes to serve three purposes. First it gathers mathematical material from diverse but related fields of order statistics, records, extreme value theory, majorization, regular variation and subexponentiality. All of these are relevant for understanding fat tails but they are not to our knowledge brought together in a single source for the target readership. Proofs that give insight are included but for most fussy calculations the reader is referred to the excellent sources referenced in the text. Multivariate extremes are not treated. This allows us to present material spread over hundreds of pages in specialist texts in twenty pages. Chapter 5 develops new material on heavy tail diagnostics and gives more mathematical detail. Since variances and covariances may not exist for heavy tailed joint distributions. Chapter 6 reviews dependence concepts for certain classes of heavy tailed joint distributions with a view to regressing heavy tailed variables. Second it presents a new measure of obesity. The most popular definitions in terms of regular variation and subexponentiality invoke putative properties that hold at infinity and this complicates any empirical estimate. Each definition captures some but not all of the intuitions associated with tail heaviness.

Chapter 5 studies two candidate indices of tail heaviness based on the tendency of the mean excess plot to collapse as data are aggregated. The probability that the largest value is more than twice the second largest has intuitive appeal but its estimator has very poor accuracy. The Obesity index is defined for a positive random variable X as $Ob(X) = P(X_1 \geq 4X_2, X_3 \leq X_1, X_2 \leq X_3, X_4 \leq X_1)$ where X_1, X_2, X_3, X_4 are independent copies of X . For empirical distributions obesity is defined by bootstrapping. This index reasonably captures intuitions of tail heaviness. Among its properties if $\alpha > 1$ then $Ob(X) \leq Ob(Y)$. However it does not completely mimic the tail index of regularly varying distributions or the extreme value index. A Weibull distribution with shape 1/4 is more obese than a Pareto distribution with tail index 1 even though this Pareto has infinite mean and the Weibull's moments are all finite. Chapter 5 explores properties of the Obesity index. Third and most important we hope to convince the reader that fat tail phenomena pose real problems: they are really out there and they seriously challenge our usual ways of thinking about historical averages, outliers, trends, regression coefficients and confidence bounds among many other things. Data on flood insurance claims, crop loss claims, hospital discharge bills, precipitation and damages and fatalities from natural catastrophes drive this point home. While most fat tailed distributions are bad, research in fat tails is one distribution whose tail will hopefully get fatter.

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the octonauts and the frown