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28th International Colloquium, Icalp 2001 Crete, Greece, July 8-12, 2001 : Proceedings
Probability on Graphs and Trees, Markov Chains and Random Fields, Entropy and Coding
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Algorithms and Data Structures
Discrete Mathematics
Algorithms and Theory of Computation Handbook, Second Edition, Volume 2
Elementary and Beyond
High-Dimensional Probability
Queueing Theory in Action
Information Security Applications
Introduction to Combinatorial Optimization, Randomization, Approximation, and Heuristics
Computational Complexity

Concentration Inequalities
Counting, Sampling and Integrating: Algorithms and Complexity
An Introduction with Applications in Data Science
5th International Worshop on Security, IWSEC 2010, Kobe, Japan, November 22-24, 2010, Proceedings

HADASSAH MADDEN

Automata, Languages and Programming
Birkhäuser
The role of probability in computer science has been growing for years and, in lieu of a tailored textbook, many courses have employed a variety of similar, but not entirely applicable, alternatives. To meet the needs of the computer science graduate student (and the advanced undergraduate), best-selling author Sheldon Ross has developed the premier probability text for aspiring computer scientists involved in computer simulation and modeling. The math is precise and easily understood. As with his other texts, Sheldon Ross presents very clear explanations of concepts and covers those probability models that are most in demand by, and applicable to, computer science and related majors and practitioners. Many interesting examples and exercises have been chosen to illuminate the techniques presented Examples relating to bin packing, sorting algorithms, the find algorithm, random graphs, self-organising list problems, the maximum weighted independent set problem, hashing, probabilistic verification, max SAT problem, queuing networks, distributed workload models, and many othersMany interesting examples and exercises have been chosen to illuminate the techniques presented

Probabilistic Methods for Algorithmic Discrete Mathematics
Now Publishers Inc
"This textbook is designed to accompany a one- or two-semester course for advanced undergraduates or beginning graduate students in computer science and applied mathematics. - It gives an excellent introduction to the probabilistic techniques and paradigms used in the development of probabilistic algorithms and analyses. - It assumes only an elementary background in discrete mathematics and gives a rigorous yet accessible treatment of the material, with numerous examples and applications."--Jacket.

Data Streams Springer Science & Business Media
Greatly expanded, this new edition requires only an elementary background in discrete mathematics and 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.
An Introduction to Online Computation Springer Science & Business Media
Starting around the late 1950s, several research communities began relating the geometry of graphs to stochastic processes on these graphs. This book, twenty years in the making, ties together research in the field, encompassing work on percolation, isoperimetric inequalities, eigenvalues, transition probabilities, and random walks. Written by two leading researchers, the text emphasizes intuition, while giving complete proofs and more than 850 exercises. Many recent developments, in which the authors have played a leading role, are discussed, including percolation on trees and Cayley graphs, uniform spanning forests, the mass-transport technique, and connections on random walks on graphs to embedding in Hilbert space. This state-of-the-art account of probability on networks will be indispensable for graduate students and researchers alike.
Introduction to Design Paradigms Springer
Some of the hardest computational problems have been successfully attacked through the use of probabilistic algorithms, which have an element of randomness to them. Concepts from the field of probability are also increasingly useful in analyzing the performance of algorithms, broadening our understanding beyond that provided by the worst-case or average-case analyses. This book surveys both of these emerging areas on the interface of the mathematical sciences and computer science. It is designed to attract new researchers to this area and provide them with enough background to begin explorations of their own.
Probability on Trees and Networks Springer Science & Business Media
Algorithms and Theory of Computation Handbook, Second Edition: Special Topics and Techniques provides an up-to-date compendium of fundamental computer science topics and techniques. It also illustrates how the topics and techniques come together to deliver efficient solutions to important practical problems. Along with updating and revising many of the existing chapters, this second edition contains more than 15 new chapters. This edition now covers self-stabilizing and pricing algorithms as well as the theories of privacy and anonymity, databases, computational games, and communication networks. It also discusses computational topology, natural language processing, and grid computing and explores applications in intensity-modulated radiation therapy, voting, DNA research, systems biology, and financial derivatives. This best-selling handbook continues to help computer professionals and engineers find significant information on various algorithmic topics. The expert contributors clearly define the terminology, present basic results and techniques, and offer a number of current references to the in-depth literature. They also provide a glimpse of the

major research issues concerning the relevant topics.
Performance Modeling and Design of Computer Systems Springer Science & Business Media
The book gives an accessible account of modern pro- babilistic methods for analyzing combinatorial structures and algorithms. Each topic is approached in a didactic manner but the most recent developments are linked to the basic ma- terial. Extensive lists of references and a detailed index will make this a useful guide for graduate students and researchers. Special features included: - a simple treatment of Talagrand inequalities and their applications - an overview and many carefully worked out examples of the probabilistic analysis of combinatorial algorithms - a discussion of the "exact simulation" algorithm (in the context of Markov Chain Monte Carlo Methods) - a general method for finding asymptotically optimal or near optimal graph colouring, showing how the probabilistic method may be fine-tuned to explit the structure of the underlying graph - a succinct treatment of randomized algorithms and derandomization techniques
Probability and Computing Oxford University Press
In this fully revised second edition of Understanding Probability, the reader can learn about the world of probability in an informal way. The author demystifies the law of large numbers, betting systems, random walks, the bootstrap, rare events, the central limit theorem, the Bayesian approach and more. This second edition has wider coverage, more explanations and examples and exercises, and a new chapter introducing Markov chains, making it a great choice for a first probability course. But its easy-going style makes it just as valuable if you want to learn about the subject on your own, and high school algebra is really all the mathematical background you need.
Invitation to Discrete Mathematics Cambridge University Press
Pairwise Independence and Derandomization gives several applications of the following paradigm, which has proven extremely powerful in algorithm design and computational complexity. First, design a probabilistic algorithm for a given problem. Then, show that the correctness analysis of the algorithm remains valid even when the random strings used by the algorithm do not come from the uniform distribution, but rather from a small sample space, appropriately chosen. In some cases this can be proven directly (giving "unconditional derandomization"), and in others it uses computational assumptions, like the existence of 1-way functions (giving "conditional derandomization"). Pairwise Independence and Derandomization is self contained, and is a prime manifestation of the "derandomization" paradigm. It is intended for scholars and graduate students in the field of theoretical computer science interested in randomness, derandomization and their interplay with computational complexity.
Pairwise Independence and Derandomization Springer Science & Business Media
A survey of pseudorandomness, the

theory of efficiently generating objects that look random despite being constructed using little or no randomness. This theory has significance for areas in computer science and mathematics, including computational complexity, algorithms, cryptography, combinatorics, communications, and additive number theory. Cambridge University Press

A fascinating exploration of how insights from computer algorithms can be applied to our everyday lives, helping to solve common decision-making problems and illuminate the workings of the human mind All our lives are constrained by limited space and time, limits that give rise to a particular set of problems. What should we do, or leave undone, in a day or a lifetime? How much messiness should we accept? What balance of new activities and familiar favorites is the most fulfilling? These may seem like uniquely human quandaries, but they are not: computers, too, face the same constraints, so computer scientists have been grappling with their version of such issues for decades. And the solutions they've found have much to teach us. In a dazzlingly interdisciplinary work, acclaimed author Brian Christian and cognitive scientist Tom Griffiths show how the algorithms used by computers can also untangle very human questions. They explain how to have better hunches and when to leave things to chance, how to deal with overwhelming choices and how best to connect with others. From finding a spouse to finding a parking spot, from organizing one's inbox to understanding the workings of memory, Algorithms to Live By transforms the wisdom of computer science into strategies for human living.

Probability and Computing Oxford University Press

An accessible account of the rich theory surrounding concentration inequalities in probability theory, with applications from machine learning and statistics to high-dimensional geometry. This book introduces key ideas and presents a detailed summary of the state-of-the-art in the area, making it ideal for independent learning and as a reference.

Probability and Algorithms Probability and ComputingRandomized Algorithms and Probabilistic Analysis

For many applications a randomized algorithm is either the simplest algorithm available, or the fastest, or both. This tutorial presents the basic concepts in the design and analysis of randomized algorithms. The first part of the book presents tools from probability theory and probabilistic analysis that are recurrent in algorithmic applications. Algorithmic examples are given to illustrate the use of each tool in a concrete setting. In the second part of the book, each of the seven chapters focuses on one important area of application of randomized algorithms: data structures; geometric algorithms; graph algorithms; number theory; enumeration; parallel algorithms; and on-line algorithms. A comprehensive and representative selection of the algorithms in these areas is also given. This book should prove invaluable as a reference for researchers and professional programmers, as well as for students.

Chance Rules in Everyday Life Springer

In the data stream scenario, input arrives very rapidly and there is limited memory to store the input. Algorithms have to work with one or few passes over the data, space less than linear in the input size or time significantly less than the input size. In the past few years, a new theory has emerged for reasoning about algorithms that work within these constraints on space, time, and number of passes. Some of the methods rely on metric embeddings, pseudo-random computations, sparse approximation theory and communication complexity. The applications for this scenario include IP network traffic analysis, mining text message streams and processing massive data sets in general. Researchers in Theoretical Computer Science, Databases, IP Networking and Computer Systems are working on the data stream challenges.
17th Annual European Symposium, Copenhagen, Denmark, September 7-9, Proceedings Cambridge University Press
Over the past decade, many major advances have been made in the field of graph coloring via the probabilistic method. This monograph, by two of the best on the topic, provides an accessible and unified treatment of these results, using tools such as the Lovasz Local Lemma and Talagrand's concentration inequality.
Advances in Information and Computer Security Cambridge University Press
The emphasis in this book is placed on general models (Markov chains, random fields, random graphs), universal methods (the probabilistic method, the coupling method, the Stein-Chen method, martingale methods, the method of types) and versatile tools (Chernoff's bound, Hoeffding's inequality, Holley's inequality) whose domain of application extends far beyond the present text. Although the examples treated in the book relate to the possible applications, in the communication and computing sciences, in operations research and in physics, this book is in the first instance concerned with theory. The level of the book is that of a beginning graduate course. It is self-contained, the prerequisites consisting merely of basic calculus (series) and basic linear algebra (matrices). The reader is not assumed to be trained in probability since the first chapters give in considerable detail the background necessary to understand the rest of the book.
Randomized Algorithms Springer Science & Business Media
Property testing algorithms are ultra"-efficient algorithms that decide whether a given object (e.g., a graph) has a certain property (e.g., bipartiteness), or is significantly different from any object that has the property. To this end property testing algorithms are given the ability to perform (local) queries to the input, though the decisions they need to make usually concern properties with a global nature. In the last two decades, property testing algorithms have been designed for many types of objects and properties, amongst them, graph properties, algebraic properties, geometric properties, and more. In this article we survey results in property testing, where our emphasis is on common analysis and algorithmic techniques. Among the techniques surveyed are the following: a) The self-

correcting approach, which was mainly applied in the study of property testing of algebraic properties; b) The enforce and test approach, which was applied quite extensively in the analysis of algorithms for testing graph properties (in the dense-graphs model), as well as in other contexts; c) Szemeredi's Regularity Lemma, which plays a very important role in the analysis of algorithms for testing graph properties (in the dense-graphs model); d) The approach of Testing by implicit learning, which implies efficient testability of membership in many functions classes. e) Algorithmic techniques for testing properties of sparse graphs, which include local search and random walks.

Algorithmic and Analysis Techniques in Property Testing Springer Science & Business Media

The subject of these notes is counting and related topics, viewed from a computational perspective. A major theme of the book is the idea of accumulating information about a set of combinatorial structures by performing a random walk on those structures. These notes will be of value not only to teachers of postgraduate courses on these topics, but also to established researchers. For the first time this body of knowledge has been brought together in a single volume.

Notes on Randomized Algorithms National Academies Press

Algorithmic design, especially for hard problems, is more essential for success in solving them than any standard improvement of current computer tech nologies. Because of this, the design of algorithms for solving hard problems is the core of current algorithmic research from the theoretical point of view as well as from the practical point of view. There are many general text books on algorithmics, and several specialized books devoted to particular approaches such as local search, randomization, approximation algorithms, or heuristics. But there is no textbook that focuses on the design of algorithms for hard computing tasks, and that systematically explains, combines, and compares the main possibilities for attacking hard algorithmic problems. As this topic is fundamental for computer science, this book tries to close this gap. Another motivation, and probably the main reason for writing this book, is connected to education. The considered area has developed very dynami cally in recent years and the research on this topic discovered several profound results, new concepts, and new methods. Some of the achieved contributions are so fundamental that one can speak about paradigms which should be in cluded in the education of every computer science student. Unfortunately, this is very far from reality. This is because these paradigms are not sufficiently known in the computer science community, and so they are insufficiently com municated to students and practitioners.

Algorithms and Applications Now Publishers Inc

The Fifth International Workshop on Security (IWSEC 2010) was held at Kobe InternationalConferenceC enter,Kobe,Japan,Novemb er22–24,2010. Thewo- shop was co-organized by CSEC, a special interest group concerned with the computer security of the Information Processing Society of Japan (IPSJ) and ISEC,atechnicalgroupconc

ernedwiththe informationsecurityofTheI nstitute of Electronics, Information and Communication Engineers (IEICE). The exc-lentLocalOrganizingComm itteewasledbytheIWSEC20 10GeneralCo-chairs, Hiroaki Kikuchi and Toru Fujiwara. This year IWSEC 2010 had three tracks, the Foundations of Security (Track I), Security in Networks and Ubiquitous Computing Systems (Track II), and Security in Real Life Applications (Track III), and the review and selection processes for these tracks were independent of each other. We received 75 paper submissions including 44 submissions for Track I, 20 submissions for Track II, and 11 submissions for Track III. We would like to thank all the authors who submitted papers. Each paper was reviewed by at least three reviewers. In -dition to the Program Committee members, many external reviewers joined the review process from their particular areas of expertise. We were fortunate to have this energetic team of experts, and are grateful to all of them for their hard work. This hard work included very active discussions; the discussion phase was almost as long as the initial individual reviewing. The review and discussions weresupportedbyaverynic eWeb-basedsystem,iChair. Wewouldliketothank its developers. Following the review phases, 22 papers including 13 papers for Track I, 6 papers for Track II, and 3 papers for Track III were accepted for publication in this volume of Advances in Information and Computer Security.