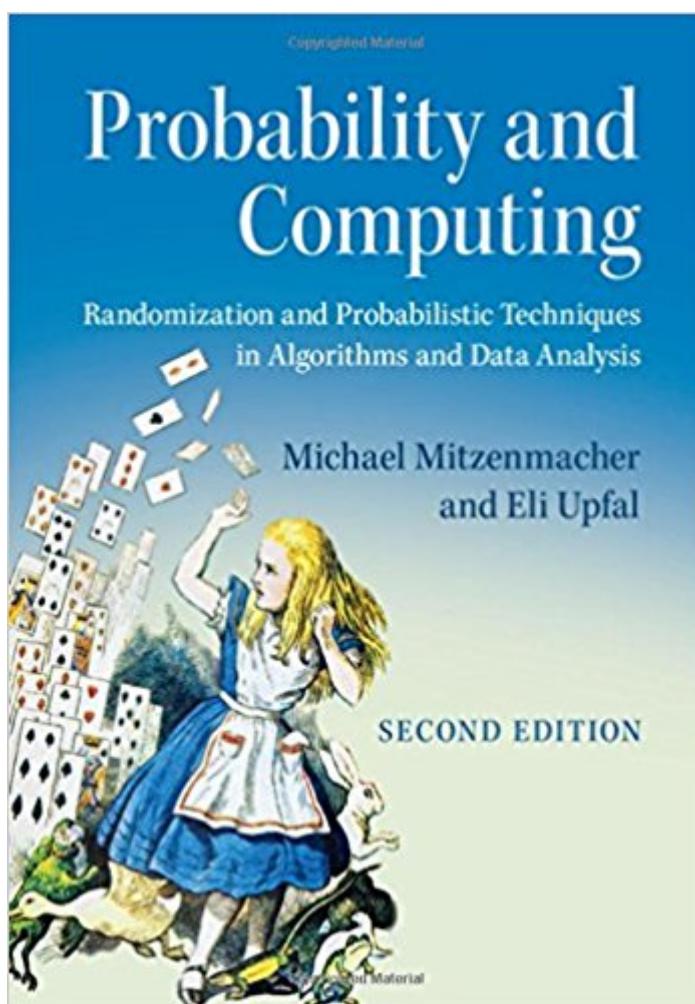


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# Probability And Computing: Randomization And Probabilistic Techniques In Algorithms And Data Analysis



## Synopsis

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.

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'As randomized methods continue to grow in importance, this textbook provides a rigorous yet accessible introduction to fundamental concepts that need to be widely known. The new chapters in this second edition, about sample size and power laws, make it especially valuable for today's applications.' Donald E. Knuth, Stanford University 'Of all the courses I have taught at Berkeley, my favorite is the one based on the Mitzenmacher-Upfal book Probability and Computing. Students appreciate the clarity and crispness of the arguments and the relevance of the material to the study of algorithms. The new Second Edition adds much important material on continuous random variables, entropy, randomness and information, advanced data structures and topics of current

interest related to machine learning and the analysis of large data sets.' Richard M. Karp, University of California, Berkeley'The new edition is great. I'm especially excited that the authors have added sections on the normal distribution, learning theory and power laws. This is just what the doctor ordered or, more precisely, what teachers such as myself ordered!' Anna Karlin, University of Washington

This greatly expanded new edition, requiring only an elementary background in discrete mathematics, comprehensively covers randomization and probabilistic techniques in modern computer science. It includes new material relevant to machine learning and big data analysis, plus examples and exercises, enabling students to learn modern techniques and applications.

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