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**Introduction to Computer Theory** - Daniel I. A. Cohen - 1986-01-17
An easy-to-comprehend text for required undergraduate courses in computer theory, this work thoroughly covers the three fundamental areas of computer theory--formal languages, automata theory, and Turing machines. It is an imaginative and pedagogically strong attempt to remove the unnecessary mathematical complications associated with the study of these subjects. The author substitutes graphic representation for symbolic proofs, allowing students with poor mathematical background to

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A fundamental introduction to modern game theory from amathematical viewpoint Game theory arises in almost every fact of human and inhumaninteraction since oftentimes during these communications objectivesare opposed or cooperation is viewed as an option. From economicsand finance to biology and computer science, researchers andpractitioners are often put in complex decision-making scenarios,whether they are interacting with each

other or working withevolving technology and artificial intelligence. Acknowledging therole of mathematics in making logical and advantageous decisions,Game Theory: An Introduction uses modern software applications tocreate, analyze, and implement effective decision-makingmodels. While most books on modern game theory are either too abstractor too applied, this book provides a balanced treatment of thesubject that is both conceptual and hands-on. Game Theoryintroduces readers to the basic theories behind games and presentsreal-world examples from various fields of study such as economics,political science, military science, finance, biological science aswell as general game playing. A unique feature of this book is theuse of Maple to find the values and strategies of games, and inaddition, it aids in the implementation of algorithms for thesolution or visualization of game concepts. Maple is also utilizedto facilitate a visual learning environment of game theory and actsas the primary tool for the calculation of complex non-cooperativeand cooperative games. Important game theory topics are presented within the followingfive main areas of coverage: Two-person zero sum matrix games Nonzero sum games and the reduction to nonlinear programming Cooperative games, including discussion of both the Nucleolusconcept and the Shapley value Bargaining, including threat strategies Evolutionary stable strategies and population games Although some mathematical competence is assumed, appendices areprovided to act as a refresher of the basic concepts of linearalgebra, probability, and statistics. Exercises are included at theend of each section along with algorithms for the solution of thegames to help readers master the presented information. Also,explicit Maple and Mathematica® commands are included in thebook and are available as worksheets via the book's related Website. The use of this software allows readers to solve many moreadvanced and interesting games without spending time on the theoryof linear and nonlinear programming or performing other complexcalculations. With extensive examples illustrating game theory's wide range

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**Theory of Computational Complexity** - Ding-Zhu Du - 2014-07-18
Praise for the First Edition "complete, up-to-date coverage of computational complexitytheorythe book promises to become the standard reference oncomputational complexity." -Zentralblatt MATH A thorough revision based on advances in the field ofcomputational complexity and readers' feedback, the SecondEdition of Theory of Computational Complexity presentsupdates to the principles and applications essential tounderstanding modern computational complexity theory. The newedition continues to serve as a comprehensive resource on the useof software and computational approaches for solving algorithmicproblems and the related difficulties that can be encountered. Maintaining extensive and detailed coverage, Theory ofComputational Complexity, Second Edition, examines the theoryand methods behind complexity theory, such as computational models,decision tree complexity, circuit complexity, and probabilisticcomplexity. The Second Edition also features recentdevelopments on areas such as NP-completeness theory, as wellas: A new combinatorial proof of the PCP theorem based on thenotion of expander graphs, a research area in the field of computerscience Additional exercises at varying levels of difficulty to furthertest comprehension of the presented material End-of-chapter literature reviews that summarize each topic andoffer additional sources for further study Theory of Computational Complexity, Second Edition, is anexcellent textbook for courses on computational theory andcomplexity at the graduate level. The book is also a usefulreference for practitioners in the fields of computer science,engineering, and

mathematics who utilize state-of-the-art softwareand computational methods to conduct research. Athorough revision based on advances in the field of computationalcomplexity and readers'feedback,the Second Edition of Theory of Computational Complexity presentsupdates to theprinciplesand applications essential to understanding modern computationalcomplexitytheory.The new edition continues to serve as a comprehensive resource onthe use of softwareandcomputational approaches for solving algorithmic problems and therelated difficulties thatcanbe encountered.Maintainingextensive and detailed coverage, Theory of ComputationalComplexity, SecondEdition,examines the theory and methods behind complexity theory, such ascomputationalmodels,decision tree complexity, circuit complexity, and probabilisticcomplexity. The SecondEditionalso features recent developments on areas such as NP-completenesstheory, as well as:•A new combinatorial proof of the PCP theorem based on the notion ofexpandergraphs,a research area in

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**Deep Learning** - Ian Goodfellow - 2016-11-10 An introduction to a broad range of topics in deep learning, covering mathematical and conceptual background, deep learning

techniques used in industry, and research perspectives. "Written by three experts in the field, Deep Learning is the only comprehensive book on the subject." —Elon Musk, cochair of OpenAI; cofounder and CEO of Tesla and SpaceX Deep learning is a form of machine learning that enables computers to learn from experience and understand the world in terms of a hierarchy of concepts. Because the computer gathers knowledge from experience, there is no need for a human computer operator to formally specify all the knowledge that the computer needs. The hierarchy of concepts allows the computer to learn complicated concepts by building them out of simpler ones; a graph of these hierarchies would be many layers deep. This book introduces a broad range of topics in deep learning. The text offers mathematical and conceptual background, covering relevant concepts in linear algebra, probability theory and information theory, numerical computation, and machine learning. It describes deep learning techniques used by practitioners in industry, including deep feedforward networks, regularization,

optimization algorithms, convolutional networks, sequence modeling, and practical methodology; and it surveys such applications as natural language processing, speech recognition, computer vision, online recommendation systems, bioinformatics, and videogames. Finally, the book offers research perspectives, covering such theoretical topics as linear factor models, autoencoders, representation learning, structured probabilistic models, Monte Carlo methods, the partition function, approximate inference, and deep generative models. Deep Learning can be used by undergraduate or graduate students planning careers in either industry or research, and by software engineers who want to begin using deep learning in their products or platforms. A website offers supplementary material for both readers and instructors.

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**Computers and Intractability** - Michael R. Garey - 1979
"Shows how to recognize NP-complete problems and offers proactical suggestions for dealing with them effectively. The book covers the basic theory of NP-completeness, provides an overview of alternative directions for further research, and contains and extensive list of NP-complete and NP-hard problems, with more than 300 main entries and several times as many results in total. [This book] is suitable as a supplement to courses in algorithm design, computational complexity, operations research, or combinatorial mathematics, and as a text for seminars on approximation algorithms or computational complexity. It provides not only a valuable source of information for students but also an essential reference work for professionals in computer science"--Back cover.

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**Algorithms and Theory of Computation Handbook, Second Edition, Volume 2** - Mikhail J. Atallah - 2009-11-20
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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.

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**Visual Computing for Medicine** - Bernhard Preim - 2013-11-07
Visual Computing for Medicine, Second Edition, offers cutting-edge visualization techniques and their applications in medical diagnosis, education, and treatment. The book includes algorithms, applications, and ideas on achieving reliability of results and clinical evaluation of the techniques covered. Preim and Botha illustrate visualization techniques from research, but also cover the information required to solve practical clinical problems. They base the book on several years of combined teaching and research experience. This new edition includes six new chapters on treatment planning, guidance and training; an updated appendix on software support for visual computing for medicine; and a new global structure that better classifies and explains the major lines of work in the field. Complete guide to visual computing in medicine, fully revamped and updated with new developments in the field Illustrated in full color Includes a companion website offering additional content for professors, source code, algorithms, tutorials, videos, exercises, lessons, and more

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**Foundations of Computer Science** - Alfred V. Aho - 1994-10-15

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on many-valued, intuitionistic, modal, paraconsistent, and substructural logical consequences. The topic of non-deductive consequence is elaborated on from the viewpoints of abductive, inductive, and probabilistic logics. All in all, the major contemporary (classes of) logical systems are here discussed. The approach is mathematical in essence, and the mathematical background, mainly founded on order relations, is treated thoroughly and in an accessible way for the non-mathematician.

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**Computer Graphics** - Jonas Gomes - 2012-04-24
Computer Graphics: Theory and Practice provides a complete and integrated introduction to this area. The book only requires basic knowledge of calculus and linear algebra, making it an accessible introductory text for students. It focuses on conceptual aspects of computer graphics, covering fundamental mathematical theories and models and the inherent problems in implementing them. In so doing, the book introduces readers to the core challenges of the field and provides suggestions for further reading and studying on various topics. For each conceptual problem described, solution strategies are compared and presented in algorithmic form. This book, along with its companion Design and Implementation of 3D Graphics Systems, gives readers a full understanding of the principles and practices of implementing 3D graphics systems.

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**Measurement Theory in Action** - Kenneth S Shultz - 2020-12-29
Measurement Theory in Action, Third Edition,

helps readers apply testing and measurement theories and features 22 self-contained modules which instructors can match to their courses. Each module features an overview of a measurement issue and a step-by-step application of that theory. Best Practices provide recommendations for ensuring the appropriate application of the theory. Practical Questions help students assess their understanding of the topic. Students can apply the material using real data in the Exercises, some of which require no computer access, while others involve the use of statistical software to solve the problem. Case Studies in each module depict typical dilemmas faced when applying measurement theory followed by Questions to Ponder to encourage critical examination of the issues noted in the cases. The book's website houses the data sets, additional exercises, PowerPoints, and more. Other features include suggested readings to further one's understanding of the topics, a glossary, and a comprehensive exercise in Appendix A that incorporates many of the steps in the development of a measure of typical performance. Updated throughout to reflect recent changes in the field, the new edition also features: Recent changes in understanding measurement, with over 50 new and updated references Explanations of why each chapter, article, or book in each module's Further Readings section is recommended Instructors will find suggested answers to the book's questions and exercises; detailed solutions to the exercises; test bank with 10 multiple choice and 5 short answer questions for each module; and PowerPoint slides. Students and instructors can access SPSS data sets; additional exercises; the glossary; and additional information helpful in understanding psychometric concepts. It is ideal as a text for any psychometrics or testing and measurement course taught in psychology, education, marketing, and management. It is also an invaluable reference for professional researchers in need of a quick refresher on applying measurement theory.

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**Quantum Information Theory** - Mark M. Wilde

- 2017-02-06

Developing many of the major, exciting, pre- and post-millennium developments from the ground up, this book is an ideal entry point for graduate students into quantum information theory. Significant attention is given to quantum mechanics for quantum information theory, and careful studies of the important protocols of teleportation, superdense coding, and entanglement distribution are presented. In this new edition, readers can expect to find over 100 pages of new material, including detailed discussions of Bell's theorem, the CHSH game, Tsirelson's theorem, the axiomatic approach to quantum channels, the definition of the diamond norm and its interpretation, and a proof of the Choi–Kraus theorem. Discussion of the importance of the quantum dynamic capacity formula has been completely revised, and many new exercises and references have been added. This new edition will be welcomed by the upcoming generation of quantum information theorists and the already established community of classical information theorists.

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**Spectral Theory and Excitation of Open Structures** - V. P. Shestopalov - 1996
Open resonators, open waveguides and open diffraction gratings are used extensively in modern millimetre and submillemetre technology, spectroscopy and radio engineering. In this book, the physical processes in these open electromagnetic structures are analyzed using a specially constructed spectral theory. The solution of electromagnetic problems in open structures requires a different approach from that used for closed structures because of radiation loss, edges, multiconnected cross-sections and the need to take into account the behavior of electromagnetic fields at infinity. This book, which is written by two authorities in the field of mathematical modeling, should be of interest to all engineers concerned with the analysis of electrodynamic structures.