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On the Foundations of Computing
7th International Conference, MACIS 2017, Vienna, Austria, November 15-17, 2017, Proceedings
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Mathematics for Computer Science CRC Press
From the exciting history of its development in ancient times to the present day, Introduction to Cryptography with Mathematical Foundations and Computer Implementations provides a focused tour of the central concepts of cryptography. Rather than present an encyclopedic treatment of topics in cryptography, it delineates cryptographic concepts in chronological order, developing the mathematics as needed. Written in an engaging yet rigorous style, each chapter introduces important concepts with clear definitions and theorems. Numerous examples explain key points while figures and tables help illustrate more difficult or subtle concepts. Each chapter is punctuated with "Exercises for the Reader;" complete solutions for these are included in an appendix. Carefully crafted exercise sets are also provided at the end of each chapter, and detailed solutions to most odd-numbered exercises can be found in a designated appendix. The computer implementation section at the end of every chapter guides students through the process of writing their own programs. A supporting website provides an extensive set of sample programs as well as downloadable platform-independent applet pages for some core programs and algorithms. As the reliance on cryptography by business, government, and industry continues and new technologies for transferring data become available, cryptography plays a permanent, important role in day-to-day operations. This self-contained sophomore-level text traces the evolution of the field, from its origins through present-day cryptosystems, including public key cryptography and elliptic curve cryptography.
Essential Discrete Mathematics for Computer Science New Age International
This book constitutes the refereed proceedings of the 7th International Conference on Mathematical Aspects of Computer and Information Sciences, MACIS 2017, held in Vienna, Austria, in November 2017. The 28 revised papers and 8 short papers presented were carefully reviewed and selected from 67 submissions. The papers are organized in the following topical sections: foundation of algorithms in mathematics, engineering and scientific computation; combinatorics and codes in computer science; data modeling and analysis; and mathematical aspects of information security and cryptography.
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The Interesting Feature Of This Book Is Its Organization And Structure. That Consists Of Systematizing Of The Definitions, Methods, And Results That Something Resembling A Theory. Simplicity, Clarity, And Precision Of Mathematical Language Makes Theoretical Topics More Appealing To The Readers Who Are Of Mathematical Or Non-Mathematical Background. For Quick References And Immediate Attentions¾Concepts And Definitions, Methods And Theorems, And Key Notes Are Presented Through Highlighted Points From Beginning To End. Whenever, Necessary And Probable A Visual Approach Of Presentation Is Used. The Amalgamation Of Text And Figures Make Mathematical Rigors Easier To Understand. Each Chapter Begins With The Detailed Contents, Which Are Discussed Inside The Chapter And Conclude With A Summary Of The Material Covered In The Chapter. Summary Provides A Brief Overview Of All The Topics Covered In The Chapter. To Demonstrate The Principles Better, The Applicability Of The Concepts Discussed In Each Topic Are Illustrated By Several Examples Followed By The Practice Sets Or Exercises.
Cambridge University Press
Judith Gersting's Mathematical Structures for Computer Science has long been acclaimed for its clear presentation of essential concepts and its exceptional range of applications relevant to computer science majors. Now with this new edition, it is the first discrete mathematics textbook revised to meet the proposed new ACM/IEEE standards for the course.
A Visual Approach PHI Learning Pvt. Ltd.
This book constitutes the refereed proceedings of the 34th International Symposium on Mathematical Foundations of Computer Science, MFCS 2009, held in Novy Smokovec, High Tatras, Slovakia, in August 2009. The 56 revised full papers presented together with 7 invited lectures were carefully reviewed and selected from 148 submissions. All current aspects in theoretical computer science and its mathematical foundations are addressed, including algorithmic game theory, algorithmic tearning theory, algorithms and data structures, automata, grammars and formal languages, bioinformatics, complexity, computational geometry, computer-assisted reasoning, concurrency theory, cryptography and security, databases and knowledge-based systems, formal specifications and program development, foundations of computing, logic in computer science, mobile computing, models of computation, networks, parallel and distributed computing, quantum computing, semantics and verification of programs, theoretical issues in artificial intelligence.
12th Symposium held at Bratislava, Czechoslovakia, August 25-29, 1986. Proceedings Laxmi Publications
This volume presents research results ranging from those in pure mathematical theory (semigroup theory, graph theory, etc.) to those in theoretical and applied computer science, e.g. formal languages, automata, codes, parallel and distributed computing, formal systems, knowledge systems and database theory.
Mathematical Foundations of Computer Science Macmillan
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Mathematical Foundation for Computer Science Pearson Education
This text gives a clear, but rigorous description of the fundamental mathematical concepts used by computer scientists, while at the same time emphasising the need for careful justification. The authors provide proofs of all the major results; all the algorithms presented are developed carefully and their performance is analysed. Throughout, the aim is to provide a well balanced treatment of both the discrete and continuous mathematics that should be studied by the serious student of computer science. The book will therefore be most suited to those undergraduate programmes that put the emphasis on such areas as programming language semantics, program correctness, and

algorithm analysis and design.

Foundations of Data Science Princeton University Press

The fundamental mathematical tools needed to understand machine learning include linear algebra, analytic geometry, matrix decompositions, vector calculus, optimization, probability and statistics. These topics are traditionally taught in disparate courses, making it hard for data science or computer science students, or professionals, to efficiently learn the mathematics. This self-contained textbook bridges the gap between mathematical and machine learning texts, introducing the mathematical concepts with a minimum of prerequisites. It uses these concepts to derive four central machine learning methods: linear regression, principal component analysis, Gaussian mixture models and support vector machines. For students and others with a mathematical background, these derivations provide a starting point to machine learning texts. For those learning the mathematics for the first time, the methods help build intuition and practical experience with applying mathematical concepts. Every chapter includes worked examples and exercises to test understanding. Programming tutorials are offered on the book's web site.

C Edition Macmillan Higher Education

This easy-to-follow textbook/reference presents a concise introduction to mathematical analysis from an algorithmic point of view, with a particular focus on applications of analysis and aspects of mathematical modelling. The text describes the mathematical theory alongside the basic concepts and methods of numerical analysis, enriched by computer experiments using MATLAB, Python, Maple, and Java applets. This fully updated and expanded new edition also features an even greater number of programming exercises. Topics and features: describes the fundamental concepts in analysis, covering real and complex numbers, trigonometry, sequences and series, functions, derivatives, integrals, and curves; discusses important applications and advanced topics, such as fractals and L-systems, numerical integration, linear regression, and differential equations; presents tools from vector and matrix algebra in the appendices, together with further information on continuity; includes added material on hyperbolic functions, curves and surfaces in space, second-order differential equations, and the pendulum equation (NEW); contains experiments, exercises, definitions, and propositions throughout the text; supplies programming examples in Python, in addition to MATLAB (NEW); provides supplementary resources at an associated website, including Java applets, code source files, and links to interactive online learning material. Addressing the core needs of computer science students and researchers, this clearly written textbook is an essential resource for undergraduate-level courses on numerical analysis, and an ideal self-study tool for professionals seeking to enhance their analysis skills.

Mathematical Foundations of Computer Networking Courier Corporation

Please note: Taylor & Francis does not sell or distribute the Hardback in India, Pakistan, Nepal, Bhutan, Bangladesh and Sri Lanka

Mathematical Foundations of Information Theory Springer

This book constitutes the refereed post-proceedings of the Second International Conference on Theoretical and Mathematical Foundations of Computer Science, ICTMF 2011, held in Singapore in May 2011. The conference was held together with the Second International Conference on High Performance Networking, Computing, and Communication systems, ICHCC 2011, which proceedings are published in CCIS 163. The 84 revised selected papers presented were carefully reviewed and selected for inclusion in the book. The topics covered range from computational science, engineering and technology to digital signal processing, and computational biology to game theory, and other related topices.

Mathematical Foundations of Data Science Using R Partridge Publishing

This book is intended as a serious introduction to the studyof mathematical analysis. In contrast to calculus, mathematical analysis does not involve formula manipulation, memorizing integrals or applications to other fields of science. No.It involves geometric intuition and proofs of theorems. It ispure mathematics! Given the mathematical preparation andinterest of our intended audience which, apart from mathematics majors, includes students of statistics, computer science, physics, students of mathematics education and students of engineering, we have not given the axiomatic development of the real number system. However, we assumethat the reader is familiar with sets and functions. This bookis divided into two parts. Part I covers elements of mathematical analysis which include: the real number system, bounded subsets of real numbers, sequences of real numbers, monotone sequences, Bolzano-Weierstrass theorem, Cauchysequences and completeness of R, continuity, intermediatevalue theorem, continuous maps on [a, b], uniform continuity, closed sets, compact sets, differentiability, series of nonnegative real numbers, alternating series, absolute and conditional convergence; and re-arrangement of series. The contents of Part I are adequate for a semester course in mathematical analysis at the 200 level. Part II covers Riemannintegrals. In particular, the Riemann integral, basic properties of Riemann integral, pointwise convergence of sequencesof functions, uniform convergence of sequences of functions, series of real-valued functions: term by term differentiationand integration; power series: uniform convergence of powerseries; uniform convergence at end points; and equi-continuity are covered. Part II covers the standard syllabus for asemester mathematical analysis course at the 300 level. Thetopics covered in this book provide a reasonable preparationfor any serious study of higher mathematics. But for one toreally benefit from the book, one must spend a great deal ofixtime on it, studying the contents very carefully and attempting all the exercises, especially the miscellaneous exercises atthe end of the book. These exercises constitute an importantintegral part of the book.Each chapter begins with clear statements of the most important theorems of the chapter. The proofs of these theoremsgenerally contain fundamental ideas of mathematical analysis. Students are therefore encouraged to study them verycarefully and to discover these id

Mathematical Foundations of Computer Science CRC Press

John Vince describes a range of mathematical topics to provide a foundation for an undergraduate course in computer science, starting with a review of number systems and their relevance to digital computers, and finishing with differential and integral calculus. Readers will find that the author's visual approach will greatly improve their understanding as to why certain mathematical structures exist, together with how they are used in real-world applications. Each chapter includes full-colour illustrations to clarify the mathematical descriptions, and in some cases, equations are also coloured to reveal vital algebraic patterns. The numerous worked examples will consolidate comprehension of abstract mathematical concepts. Foundation Mathematics for Computer Science covers number systems, algebra, logic, trigonometry, coordinate systems, determinants, vectors, matrices,

geometric matrix transforms, differential and integral calculus, and reveals the names of the mathematicians behind such inventions. During this journey, John Vince touches upon more esoteric topics such as quaternions, octonions, Grassmann algebra, Barycentric coordinates, transfinite sets and prime numbers. Whether you intend to pursue a career in programming, scientific visualisation, systems design, or real-time computing, you should find the author’s literary style refreshingly lucid and engaging, and prepare you for more advanced texts.

6th Symposium, Tatranska Lomnica September 5-9, 1977. Proceedings Alpha Science International Limited

This edition offers a pedagogically rich and intuitive introduction to discrete mathematics structures. It meets the needs of computer science majors by being both comprehensive and accessible.

Concrete Mathematics W. H. Freeman

Mathematical logic is a branch of mathematics that takes axiom systems and mathematical proofs as its objects of study. This book shows how it can also provide a foundation for the development of information science and technology. The first five chapters systematically present the core topics of classical mathematical logic, including the syntax and models of first-order languages, formal inference systems, computability and representability, and Gödel’s theorems. The last five chapters present extensions and developments of classical mathematical logic, particularly the concepts of version sequences of formal theories and their limits, the system of revision calculus, proschemes (formal descriptions of proof methods and strategies) and their properties, and the theory of inductive inference. All of these themes contribute to a formal theory of axiomatization and its application to the process of developing information technology and scientific theories. The book also describes the paradigm of three kinds of language environments for theories and it presents the basic properties required of a meta-language environment. Finally, the book brings these themes together by describing a workflow for scientific research in the information era in which formal methods, interactive software and human invention are all used to their advantage. This book represents a valuable reference for graduate and undergraduate students and researchers in mathematics, information science and technology, and other relevant areas of natural sciences. Its first five chapters serve as an undergraduate text in mathematical logic and the last five chapters are addressed to graduate students in relevant disciplines.

Foundations of Computer Science Springer

John Vince describes a range of mathematical topics to provide a foundation for an undergraduate course in computer science, starting with a review of number systems and their relevance to digital computers, and finishing with differential and integral calculus. Readers will find that the author's visual approach will greatly improve their understanding as to why certain mathematical structures exist, together with how they are used in real-world applications. Each chapter includes full-colour illustrations to clarify the mathematical descriptions, and in some cases, equations are also coloured to reveal vital algebraic patterns. The numerous worked examples will consolidate comprehension of abstract mathematical concepts. Foundation Mathematics for Computer Science covers number systems, algebra, logic, trigonometry, coordinate systems, determinants, vectors, matrices, geometric matrix transforms, differential and integral calculus, and reveals the names of the mathematicians behind such inventions. During this journey, John Vince touches upon more esoteric topics such as quaternions, octonions, Grassmann algebra, Barycentric coordinates, transfinite sets and prime numbers. Whether you intend to pursue a career in programming, scientific visualisation, systems design, or real-time computing, you should find the author’s literary style refreshingly lucid and engaging, and prepare you for more advanced texts.

Mathematical Foundations of Computer Science Springer

"To design future networks that are worthy of society's trust, we must put the 'discipline' of computer networking on a much stronger foundation. This book rises above the considerable minutiae of today's networking technologies to emphasize the long-standing mathematical underpinnings of the field." -Professor Jennifer Rexford, Department of Computer Science, Princeton University "This book is exactly the one I have been waiting for the last couple of years. Recently, I decided most students were already very familiar with the way the net works but were not being taught the fundamentals-the math. This book contains the knowledge for people who will create and understand future communications systems." -Professor Jon Crowcroft, The Computer Laboratory, University of Cambridge The Essential Mathematical Principles Required to Design, Implement, or Evaluate Advanced Computer Networks Students, researchers, and professionals in computer networking require a firm conceptual understanding of its foundations. Mathematical Foundations of Computer Networking provides an intuitive yet rigorous introduction to these essential mathematical principles and techniques. Assuming a basic grasp of calculus, this book offers sufficient detail to serve as the only reference many readers will need. Each concept is described in four ways: intuitively; using appropriate mathematical notation; with a numerical example carefully chosen for its relevance to networking; and with a numerical exercise for the reader. The first part of the text presents basic concepts, and the second part introduces four theories in a progression that has been designed to gradually deepen readers' understanding. Within each part, chapters are as self-contained as possible. The first part covers probability; statistics; linear algebra; optimization; and signals, systems, and transforms. Topics range from Bayesian networks to hypothesis testing, and eigenvalue computation to Fourier transforms. These preliminary chapters establish a basis for the four theories covered in the second part of the book: queueing theory, game theory, control theory, and information theory. The second part also demonstrates how mathematical concepts can be applied to issues such as contention for limited resources, and the optimization of network responsiveness, stability, and throughput.

Mathematics for Machine Learning Springer Science & Business Media

In order best exploit the incredible quantities of data being generated in most diverse disciplines data sciences increasingly gain worldwide importance. The book gives the mathematical foundations to handle data properly. It introduces basics and functionalities of the R programming language which has become the indispensable tool for data sciences. Thus it delivers the reader the skills needed to build own tool kits of a modern data scientist.

Mathematical Foundations of Computer Science Cambridge University Press

Computing, today more than ever before, is a multi-faceted discipline which collates several methodologies, areas of interest, and approaches: mathematics, engineering, programming, and applications. Given its enormous impact on everyday life, it is essential that its debated origins are understood, and that its different foundations are explained. On the Foundations of Computing offers

a comprehensive and critical overview of the birth and evolution of computing, and it presents some of the most important technical results and philosophical problems of the discipline, combining both historical and systematic analyses. The debates this text surveys are among the latest and most urgent ones: the crisis of foundations in mathematics and the birth of the decision problem, the nature of algorithms, the debates on computational artefacts and malfunctioning, and the analysis of computational experiments. By covering these topics, On the Foundations of Computing provides a much-needed resource to contextualize these foundational issues. For practitioners, researchers, and students alike, a historical and philosophical approach such as what this volume offers becomes essential to understand the past of the discipline and to figure out the challenges of its future.

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