

Trees Maps And Theorems

The text covers random graphs from the basic to the advanced, including numerous exercises and recommendations for further reading.

Pioneering modern treatise studies the development of the subject from Euler to Hilbert, addressing basic problems with sufficient generality and rigor to provide a sound introduction for serious study. 1904 edition.

The key idea in geometric group theory is to study infinite groups by endowing them with a metric and treating them as geometric spaces. This applies to many groups naturally appearing in topology, geometry, and algebra, such as fundamental groups of manifolds, groups of matrices with integer coefficients, etc. The primary focus of this book is to cover the foundations of geometric group theory, including coarse topology, ultralimits and asymptotic cones, hyperbolic groups, isoperimetric inequalities, growth of groups, amenability, Kazhdan's Property (T) and the Haagerup property, as well as their characterizations in terms of group actions on median spaces and spaces with walls. The book contains proofs of several fundamental results of geometric group theory, such as Gromov's theorem on groups of polynomial growth, Tits's alternative, Stallings's theorem on ends of groups, Dunwoody's accessibility theorem, the Mostow Rigidity Theorem, and quasiisometric rigidity theorems of Tukia and Schwartz. This is the first book in which geometric group theory is presented in a form accessible to advanced graduate students and young research mathematicians. It fills a big gap in the literature and will be used by researchers in geometric group theory and its applications.

Mathematics of Computing -- General.

Proceedings of the 2018 Computing Conference, Volume 2

The Theory of Matrices in Numerical Analysis

Computer Science and Computational Biology

Advanced Calculus

Chaos on the Interval

A notation called sets-as-signs is developed, and then it is demonstrated how it can be used to modify any known inference method to handle many-valued logics. Applications are discussed, both in pure mathematics, and in hardware verification and interval arithmetic. Concludes with a historical overview of activities in many-valued theorem proving. Annotation copyright by Book News, Inc., Portland, OR

Many parallels between complex dynamics and hyperbolic geometry have emerged in the past decade. Building on work of Sullivan and Thurston, this book gives a unified treatment of the construction of fixed-points for renormalization and the construction of hyperbolic 3- manifolds fibering over the circle. Both subjects are studied via geometric limits and rigidity. This approach shows open hyperbolic manifolds are inflexible, and yields quantitative counterparts to Mostow rigidity. In complex dynamics, it motivates the construction of towers of quadratic-like maps, and leads to a quantitative proof of convergence of renormalization.

Graph Theory and Computing focuses on the processes, methodologies, problems, and approaches involved in graph theory and computer science. The book first elaborates on alternating chain methods, average height of planted plane trees, and numbering of a graph. Discussions focus on numbered graphs and difference sets, Euclidean models and complete graphs, classes and conditions for graceful graphs, and maximum matching problem. The manuscript then elaborates on the evolution of the path number of a graph, production of graphs by computer, and graph-theoretic programming language. Topics include FORTRAN characteristics of GTPL, design considerations, representation and identification of graphs in a computer, production of simple graphs and star topologies, and production of stars having a given topology. The manuscript examines the entropy of transformed finite-state automata and associated languages; counting hexagonal and triangular polyominoes; and symmetry of cubical and general polyominoes. Graph coloring algorithms, algebraic isomorphism invariants for graphs of automata, and coding of various kinds of unlabeled trees are also discussed. The publication is a valuable source of information for researchers interested in graph theory and computing.

In this book the author treats four fundamental and apparently simple problems. They are: the number of primes below a given limit, the approximate number of primes, the recognition of prime numbers and the factorization of large numbers. A chapter on the details of the distribution of the primes is included as well as a short description of a recent application of prime numbers, the so-called RSA public-key cryptosystem. The author is also giving explicit algorithms and computer programs. Whilst not claiming completeness, the author has tried to give all important results known, including the latest discoveries. The use of computers has in this area promoted a development which has enormously enlarged the wealth of results known and that has made many older works and tables obsolete. As is often the case in number theory, the problems posed are easy to understand but the solutions are theoretically advanced. Since this text is aimed at the mathematically inclined layman, as well as at the more advanced student, not all of the proofs of the results given in this book are shown. Bibliographical references in these cases serve those readers who wish to probe deeper. References to recent original works are also given for those who wish to pursue some topic further. Since number theory is seldom taught in basic mathematics courses, the author has appended six sections containing all the algebra and number theory required for the main body of the book.

The Algebraic Theory of Semigroups, Volume II

The TeXbook

Geometric Group Theory

Functional Differential Equations with Infinite Delay

Introduction to Random Graphs

The aim of this book is to survey the relations between the various kinds of chaos and related notions for continuous interval maps from a topological point of view. The papers on this topic are numerous and widely scattered in the literature; some of them are little known, difficult to find, or originally published in Russian, Ukrainian, or Chinese. Dynamical systems given by the iteration of a continuous map on an interval have been broadly studied because they are simple but nevertheless exhibit complex behaviors. They also allow numerical simulations, which enabled the discovery of some chaotic phenomena. Moreover, the "most interesting" part of some higher-dimensional systems can be of lower dimension, which allows, in some cases, boiling it down to systems in dimension one. Some of the more recent developments such as distributional chaos, the relation between entropy and Li-Yorke chaos, sequence entropy, and maps with infinitely many branches are presented in book form for the first time. The author gives complete proofs and addresses both graduate students and researchers.

Modular Representations of Finite Groups

Carl Ludwig Siegel gave a course of lectures on the Geometry of Numbers at New York University during the academic year 1945-46, when there were hardly any books on the subject other than Minkowski's original one. This volume stems from Siegel's requirements of accuracy in detail, both in the text and in the illustrations, but involving no changes in the structure and style of the lectures as originally delivered. This book is an enticing introduction to Minkowski's great work. It also reveals the workings of a remarkable mind, such as Siegel's with its precision and power and aesthetic charm. It is of interest to the aspiring as well as the established mathematician, with its unique blend of arithmetic, algebra, geometry, and analysis, and its easy readability.

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.

Iterative Methods for Sparse Linear Systems

The Theory of Spinors

Graph Theory and Computing

Renormalization and 3-Manifolds Which Fiber over the Circle (AM-142), Volume 142

Proofs from THE BOOK

Describes orthogonal and related Lie groups, using real or complex parameters and indefinite metrics. Develops theory of spinors by giving a purely geometric definition of these mathematical entities.

Art gallery theorems and algorithms are so called because they relate to problems involving the visibility of geometrical shapes and their internal surfaces. This book explores generalizations and specializations in these areas. Among the presentations are recently discovered theorems on orthogonal polygons, polygons with holes, exterior visibility, visibility graphs, and visibility in three dimensions. The author formulates many open problems and offers several conjectures, providing arguments which may be followed by anyone familiar with basic graph theory and algorithms. This work may be applied to robotics and artificial intelligence as well as other fields, and will be especially useful to computer scientists working with computational and combinatorial geometry.

This book, gathering the Proceedings of the 2018 Computing Conference, offers a remarkable collection of chapters covering a wide range of topics in intelligent systems, computing and their real-world applications. The Conference attracted a total of 568 submissions from pioneering researchers, scientists, industrial engineers, and students from all around the world. These submissions underwent a double-blind peer review process. Of those 568 submissions, 192 submissions (including 14 poster papers) were selected for inclusion in these proceedings. Despite computer science's comparatively brief history as a formal academic discipline, it has made a number of fundamental contributions to science and society—in fact, along with electronics, it is a founding science of the current epoch of human history ('the Information Age') and a main driver of the Information Revolution. The goal of this conference is to provide a platform for researchers to present fundamental contributions, and to be a premier venue for academic and industry practitioners to share new ideas and development experiences. This book collects state of the art chapters on all aspects of Computer Science, from classical to intelligent. It covers both the theory and applications of the latest computer technologies and methodologies.

Providing the state of the art in intelligent methods and techniques for solving real-world problems, along with a vision of future research, the book will be interesting and valuable for a broad readership.

Trees, Maps, and Theorems Effective Communication for Rational Minds Ingram Trees, Maps, and Theorems Effective Communication for Rational Minds Presentation Zen Simple Ideas on Presentation Design and Delivery Pearson Education

Trees, Maps, and Theorems

Persistence Theory: From Quiver Representations to Data Analysis

Modular Representations of Finite Groups

Effective Communication for Rational Minds

Harmonic Mappings in the Plane

A complete revision of the first edition this book. The author has added a chapter on turbulence, and has expanded the work on paradoxes and modeling. W.M. Elsasser said of the first edition, "A book such as this, concentrating as it does on the boundaries of fundamental progress, should be indispensable to all those engaged in hydrodynamical research who are concerned with the type of generalization that so often in the past has led to fundamental progress." Originally published in 1960. The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by Princeton University Press since its founding in 1905.

The theoretical underpinnings of computing form a standard part of almost every computer science curriculum. But the classic treatment of this material isolates it from the myriad ways in which the theory influences the design of modern hardware and software systems. The goal of this book is to change that. The book is organized into a core set of chapters

(that cover the standard material suggested by the title), followed by a set of appendix chapters that highlight application areas including programming language design, compilers, software verification, networks, security, natural language processing, artificial intelligence, game playing, and computational biology. The core material includes discussions of finite state machines, Markov models, hidden Markov models (HMMs), regular expressions, context-free grammars, pushdown automata, Chomsky and Greibach normal forms, context-free parsing, pumping theorems for regular and context-free languages, closure theorems and decision procedures for regular and context-free languages, Turing machines, nondeterminism, decidability and undecidability, the Church-Turing thesis, reduction proofs, Post Correspondence problem, tiling problems, the undecidability of first-order logic, asymptotic dominance, time and space complexity, the Cook-Levin theorem, NP-completeness, Savitch's Theorem, time and space hierarchy theorems, randomized algorithms and heuristic search. Throughout the discussion of these topics there are pointers into the application chapters. So, for example, the chapter that describes reduction proofs of undecidability has a link to the security chapter, which shows a reduction proof of the undecidability of the safety of a simple protection framework.

In the theory of functional differential equations with infinite delay, there are several ways to choose the space of initial functions (phase space); and diverse (duplicated) theories arise, according to the choice of phase space. To unify the theories, an axiomatic approach has been taken since the 1960's. This book is intended as a guide for the axiomatic approach to the theory of equations with infinite delay and a culmination of the results obtained in this way. It can also be used as a textbook for a graduate course. The prerequisite knowledge is foundations of analysis including linear algebra and functional analysis. It is hoped that the book will prepare students for further study of this area, and that will serve as a ready reference to the researchers in applied analysis and engineering sciences.

This excellent 1981 treatment of the mathematical theory of entropy gives an accessible exposition its application to other fields.

Making the Most of Your Presentation

Mathematical Theory of Entropy

Introduction to Function Algebras

Intelligent Computing

Theory and Applications

This text presents selected aspects of matrix theory that are most useful in developing computational methods for solving linear equations and finding characteristic roots. Topics include norms, bounds and convergence; localization theorems; more. 1964 edition.

FOREWORD BY GUY KAWASAKI Presentation designer and internationally acclaimed communications expert Garr Reynolds, creator of the most popular Web site on presentation design and delivery on the Net – presentationzen.com – shares his experience in a provocative mix of illumination, inspiration, education, and guidance that will change the way you think about making presentations with PowerPoint or Keynote. Presentation Zen challenges the conventional wisdom of making "slide presentations" in today's world and encourages you to think differently and more creatively about the preparation, design, and delivery of your presentations. Garr shares lessons and perspectives that draw upon practical advice from the fields of communication and business. Combining solid principles of design with the tenets of Zen simplicity, this book will help you along the path to simpler, more effective presentations.

According to the great mathematician Paul Erdős, God maintains perfect mathematical proofs in The Book. This book presents the authors candidates for such "perfect proofs," those which contain brilliant ideas, clever connections, and wonderful observations, bringing new insight and surprising perspectives to problems from number theory, geometry, analysis, combinatorics, and graph theory. As a result, this book will be fun reading for anyone with an interest in mathematics.

String algorithms are a traditional area of study in computer science. In recent years their importance has grown dramatically with the huge increase of electronically stored text and of molecular sequence data (DNA or protein sequences) produced by various genome projects. This 1997 book is a general text on computer algorithms for string processing. In addition to pure computer science, the book contains extensive discussions on biological problems that are cast as string problems, and on methods developed to solve them. It emphasizes the fundamental ideas and techniques central to today's applications. New approaches to this complex material simplify methods that up to now have been for the specialist alone. With over 400 exercises to reinforce the material and develop additional topics, the book is suitable as a text for graduate or advanced undergraduate students in computer science, computational biology, or bio-informatics. Its discussion of current algorithms and techniques also makes it a reference for professionals.

Probability on Trees and Networks

Lectures on the Calculus of Variations

McGraw-Hill's 10 ACT Practice Tests, Second Edition

Understanding the Infinite

An Introduction to Enumeration and Graph Theory Fourth Edition

Persistence theory emerged in the early 2000s as a new theory in the area of applied and computational topology. This book provides a broad and modern view of the subject, including its algebraic, topological, and algorithmic aspects. It also elaborates on applications in data analysis. The level of detail of the exposition has been set so as to keep a survey style, while providing sufficient insights into the proofs so the reader can understand the mechanisms at work. The book is organized into three parts. The first part is dedicated to the foundations of persistence and emphasizes its connection to quiver representation theory. The second part focuses on its connection to applications through a

few selected topics. The third part provides perspectives for both the theory and its applications. The book can be used as a text for a course on applied topology or data analysis.

Markov Processes and Potential Theory

This is a textbook for an introductory combinatorics course lasting one or two semesters. An extensive list of problems, ranging from routine exercises to research questions, is included. In each section, there are also exercises that contain material not explicitly discussed in the preceding text, so as to provide instructors with extra choices if they want to shift the emphasis of their course. Just as with the first three editions, the new edition walks the reader through the classic parts of combinatorial enumeration and graph theory, while also discussing some recent progress in the area: on the one hand, providing material that will help students learn the basic techniques, and on the other hand, showing that some questions at the forefront of research are comprehensible and accessible to the talented and hardworking undergraduate. The basic topics discussed are: the twelvefold way, cycles in permutations, the formula of inclusion and exclusion, the notion of graphs and trees, matchings, Eulerian and Hamiltonian cycles, and planar graphs. New to this edition are the Quick Check exercises at the end of each section. In all, the new edition contains about 240 new exercises. Extra examples were added to some sections where readers asked for them. The selected advanced topics are: Ramsey theory, pattern avoidance, the probabilistic method, partially ordered sets, the theory of designs, enumeration under group action, generating functions of labeled and unlabeled structures and algorithms and complexity. The book encourages students to learn more combinatorics, provides them with a not only useful but also enjoyable and engaging reading. The Solution Manual is available upon request for all instructors who adopt this book as a course text. Please send your request to sales@wspc.com. The previous edition of this textbook has been adopted at various schools including UCLA, MIT, University of Michigan, and Swarthmore College. It was also translated into Korean.

Harmonic mappings in the plane are univalent complex-valued harmonic functions of a complex variable. Conformal mappings are a special case where the real and imaginary parts are conjugate harmonic functions, satisfying the Cauchy-Riemann equations. Harmonic mappings were studied classically by differential geometers because they provide isothermal (or conformal) parameters for minimal surfaces. More recently they have been actively investigated by complex analysts as generalizations of univalent analytic functions, or conformal mappings. Many classical results of geometric function theory extend to harmonic mappings, but basic questions remain unresolved. This book is the first comprehensive account of the theory of planar harmonic mappings, treating both the generalizations of univalent analytic functions and the connections with minimal surfaces. Essentially self-contained, the book contains background material in complex analysis and a full development of the classical theory of minimal surfaces, including the Weierstrass-Enneper representation. It is designed to introduce non-specialists to a beautiful area of complex analysis and geometry.

Art Gallery Theorems and Algorithms

Presentation Zen

The nature of capital and income

Automata, Computability and Complexity

Markov processes and potential theory

The book covers elementary aspects of category theory and topos theory. It has few mathematical prerequisites, and uses categorical methods throughout rather than beginning with set theoretic foundations. It works with key notions such as cartesian closedness, adjunctions, regular categories, and the internal logic of a topos. Full statements and elementary proofs are given for the central theorems, including the fundamental theorem of toposes, the sheafification theorem, and the construction of Grothendieck toposes over any topos as base. Three chapters discuss applications of toposes in detail, namely to sets, to basic differential geometry, and to recursive analysis. - ;Introduction; PART I: CATEGORIES: Rudimentary structures in a category; Products, equalizers, and their duals; Groups; Sub-objects, pullbacks, and limits; Relations; Cartesian closed categories; Product operators and others; PART II: THE CATEGORY OF CATEGORIES: Functors and categories; Natural transformations; Adjunctions; Slice categories; Mathematical foundations; PART III: TOPOSES: Basics; The internal language; A soundness proof for topos logic; From the internal language to the topos; The fundamental theorem; External semantics; Natural number objects; Categories in a topos; Topologies; PART IV: SOME TOPOSES: Sets; Synthetic differential geometry; The effective topos; Relations in regular categories; Further reading; Bibliography; Index. - 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.

We want to give you the practice you need on the ACT McGraw-Hill's 10 ACT Practice Tests helps you gauge what the test measures, how it's structured, and how to budget your time in each section. Written by the founder and faculty of Advantage Education, one of America's most respected providers of school-based test-prep classes, this book provides you with the intensive ACT practice that will help your scores improve from each test to the next. You'll be able to sharpen your skills, boost your confidence, reduce your stress-and to do your very best on test day. 10 complete sample ACT exams, with full explanations for every answer 10 sample writing prompts for the optional ACT essay portion Scoring Worksheets to help you calculate your total score for every test Expert guidance in prepping students for the ACT More practice and extra help online ACT is a registered trademark of ACT, Inc., which was not involved in the production of, and does not endorse, this product.

Starting with an abstract treatment of vector spaces and linear transforms, this introduction presents a corresponding theory of integration and concludes with applications to analytic functions of complex variables. 1959 edition.

Foundations of Global Non-linear Analysis

Simple Ideas on Presentation Design and Delivery

Algorithms on Strings, Trees and Sequences

Mathematics for Machine Learning

Prime Numbers and Computer Methods for Factorization