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Machine Learning and Its Applications Machine Learning and Its Applications Geometry and Its Applications Boolean Algebra and Its Applications Geometry and its Applications Basic Digital Electronics Discrete Mathematics and Its Applications Biotechnology and Its Applications AC and DC Network Theory An Introduction to Kolmogorov Complexity and Its Applications Basic Electromagnetism Quantum Mechanics, Second edition Discrete Mathematics and Its Applications Mathematical Analysis and Its Applications Machine Learning and Its Applications H? Control and Its Applications Electrons in Metals and Semiconductors Group Theory and Its Applications in Physics Credit Scoring and Its Applications, Second Edition Nonstandard Analysis and Its Applications Structured Light and Its Applications Game Theory and Its Applications An Introduction to Kolmogorov Complexity and Its Applications Clifford Analysis and Its Applications Fourier Analysis and Its Applications Graph Theory and Its Applications to Problems of Society Time Series Analysis and Its Applications Exponential Sums and their Applications Summability Theory and Its Applications Internet of Things and Its Applications Computational Science and Its Applications Linear Algebra Deep Learning and Its Applications Classical Optics and Its Applications Topology and Its Applications Classical Hopf Algebras and Their Applications Information Geometry and Its Applications Graph Theory and Its Applications, Second Edition Nonlinear Functional Analysis and Its Applications The Schur Complement and Its Applications

Topology and Its Applications Mar 18 2020 Discover a unique and modern treatment of topology employing across-disciplinary approach Implemented recently to understand diverse topics, such as cellbiology, superconductors, and robot motion, topology has been transformed from a theoretical field that highlights mathematical theory to a subject that plays a growing role in nearly all fields of scientific investigation. Moving from the concrete to the abstract, Topology and Its Applications displays both the beauty and utility of topology, first presenting the essentials of topology followed by its emerging role within the new frontiers in research. Filling a gap between the teaching of topology and its modern uses in real-world phenomena, Topology and Its Applications is organized around the mathematical theory of topology, a framework of rigorous theorems, and clear, elegant proofs. This book is the first of its kind to present applications in computer graphics, economics, dynamical systems, condensed matter physics, biology, robotics, chemistry, cosmology, material science, computational topology, and population modeling, as well as other areas of science and engineering. Many of these applications are presented in optional sections, allowing an instructor to customize the presentation. The author presents a diversity of topological areas, including point-set topology, geometric topology, differential topology, and algebraic/combinatorial topology. Topics within these areas include: Open sets Compactness Homotopy Surface classification Index theory on

surfaces Manifolds and complexes Topological groups The fundamental group and homology Special "core intuition" segments throughout the book briefly explain the basic intuition essential to understanding several topics. A generous number of figures and examples, many of which come from applications such as liquid crystals, space probe data, and computer graphics, are all available from the publisher's Website.

Fourier Analysis and Its Applications Jan 28 2021 This book presents the theory and applications of Fourier series and integrals, eigenfunction expansions, and related topics, on a level suitable for advanced undergraduates. It includes material on Bessel functions, orthogonal polynomials, and Laplace transforms, and it concludes with chapters on generalized functions and Green's functions for ordinary and partial differential equations. The book deals almost exclusively with aspects of these subjects that are useful in physics and engineering, and includes a wide variety of applications. On the theoretical side, it uses ideas from modern analysis to develop the concepts and reasoning behind the techniques without getting bogged down in the technicalities of rigorous proofs.

Classical Hopf Algebras and Their Applications Feb 15 2020 This book is dedicated to the structure and combinatorics of classical Hopf algebras. Its main focus is on commutative and cocommutative Hopf algebras, such as algebras of representative functions on groups and enveloping algebras of Lie algebras, as explored in the works of Borel, Cartier, Hopf and others in the 1940s and 50s. The modern and systematic treatment uses the approach of natural operations, illuminating the structure of Hopf algebras by means of their endomorphisms and their combinatorics. Emphasizing notions such as pseudo-coproducts, characteristic endomorphisms, descent algebras and Lie idempotents, the text also covers the important case of enveloping algebras of pre-Lie algebras. A wide range of applications are surveyed, highlighting the main ideas and fundamental results. Suitable as a textbook for masters or doctoral level programs, this book will be of interest to algebraists and anyone working in one of the fields of application of Hopf algebras.

Information Geometry and Its Applications Jan 16 2020 This is the first comprehensive book on information geometry, written by the founder of the field. It begins with an elementary introduction to dualistic geometry and proceeds to a wide range of applications, covering information science, engineering, and neuroscience. It consists of four parts, which on the whole can be read independently. A manifold with a divergence function is first introduced, leading directly to dualistic structure, the heart of information geometry. This part (Part I) can be apprehended without any knowledge of differential geometry. An intuitive explanation of modern differential geometry then follows in Part II, although the book is for the most part understandable without modern differential geometry. Information geometry of statistical inference, including time series analysis and semiparametric estimation (the Neyman–Scott problem), is demonstrated concisely in Part III. Applications addressed in Part IV include hot current topics in machine learning, signal processing, optimization, and neural networks. The book is interdisciplinary, connecting mathematics, information sciences, physics, and neurosciences, inviting readers to a new world of information and geometry. This book is highly recommended to graduate students and researchers who seek new mathematical methods and tools useful in their own fields.

Basic Electromagnetism Apr 11 2022 Professor Dobbs provides an elegant and clear account of the subject, leading the student from electrostatics through to Maxwell's equations and electromagnetic waves, covering all the material needed by a student taking courses on electricity and magnetism and electromagnetic waves.

Quantum Mechanics, Second edition Mar 10 2022 Quantum mechanics is the key to modern physics and chemistry, yet it is notoriously difficult to understand. This book is designed to overcome that obstacle. Clear and concise, it provides an easily readable introduction intended

for science undergraduates with no previous knowledge of quantum theory, leading them through to the advanced topics usually encountered at the final year level. Although the subject matter is standard, novel techniques have been employed that considerably simplify the technical presentation. The authors use their extensive experience of teaching and popularizing science to explain the many difficult, abstract points of the subject in easily comprehensible language. Helpful examples and thorough sets of exercises are also given to enable students to master the subject.

Clifford Analysis and Its Applications Feb 26 2021 In its traditional form, Clifford analysis provides the function theory for solutions of the Dirac equation. From the beginning, however, the theory was used and applied to problems in other fields of mathematics, numerical analysis, and mathematical physics. recently, the theory has enlarged its scope considerably by incorporating geometrical methods from global analysis on manifolds and methods from representation theory. New, interesting branches of the theory are based on conformally invariant, first-order systems other than the Dirac equation, or systems that are invariant with respect to a group other than the conformal group. This book represents an up-to-date review of Clifford analysis in its present form, its applications, and directions for future research. Readership: Mathematicians and theoretical physicists interested in Clifford analysis itself, or in its applications to other fields.

Graph Theory and Its Applications, Second Edition Dec 15 2019 Already an international bestseller, with the release of this greatly enhanced second edition, Graph Theory and Its Applications is now an even better choice as a textbook for a variety of courses -- a textbook that will continue to serve your students as a reference for years to come. The superior explanations, broad coverage, and abundance of illustrations and exercises that positioned this as the premier graph theory text remain, but are now augmented by a broad range of improvements. Nearly 200 pages have been added for this edition, including nine new sections and hundreds of new exercises, mostly non-routine. What else is new? New chapters on measurement and analytic graph theory Supplementary exercises in each chapter - ideal for reinforcing, reviewing, and testing. Solutions and hints, often illustrated with figures, to selected exercises - nearly 50 pages worth Reorganization and extensive revisions in more than half of the existing chapters for smoother flow of the exposition Foreshadowing - the first three chapters now preview a number of concepts, mostly via the exercises, to pique the interest of reader Gross and Yellen take a comprehensive approach to graph theory that integrates careful exposition of classical developments with emerging methods, models, and practical needs. Their unparalleled treatment provides a text ideal for a two-semester course and a variety of one-semester classes, from an introductory one-semester course to courses slanted toward classical graph theory, operations research, data structures and algorithms, or algebra and topology.

Geometry and Its Applications Dec 19 2022 Meyer's Geometry and Its Applications, Second Edition, combines traditional geometry with current ideas to present a modern approach that is grounded in real-world applications. It balances the deductive approach with discovery learning, and introduces axiomatic, Euclidean geometry, non-Euclidean geometry, and transformational geometry. The text integrates applications and examples throughout and includes historical notes in many chapters. The Second Edition of Geometry and Its Applications is a significant text for any college or university that focuses on geometry's usefulness in other disciplines. It is especially appropriate for engineering and science majors, as well as future mathematics teachers. Realistic applications integrated throughout the text, including (but not limited to): Symmetries of artistic patterns Physics Robotics Computer vision Computer graphics Stability of architectural structures Molecular biology Medicine Pattern recognition Historical notes included in many chapters

Biotechnology and its Applications Jul 14 2022 Godbey's *Biotechnology and its Applications* is written for the student with little to no background in college level biology. The goal of the book is to introduce the student to the world of biotechnology in a way that runs deeper than a mere survey. The book is divided into three units. In the first, basic science is covered to introduce the reader to the cell, how it behaves, and what it is made of. The second unit demonstrates the biotechnological application of scientific principles in the laboratory while the third unit of the book presents biotechnologies "in the real world." Examples include recombinant proteins that are available to millions of patients, plants that have been engineered to produce food that has been made available to people around the world, and regenerative medicine that may someday allow patients to receive organs that have been grown from their own cells. The second edition has been updated and expanded with the most current information available, and new chapters have been added on such topics as gene editing, bioremediation, vaccines and immunotherapy, and processing and manufacturing, resulting in a modern, robust, yet highly readable applications-oriented introduction to biotechnology. Takes an integrated approach from first principles, integrating cell biology, molecular biology, biochemistry, and health science, starting at the basic science level and building to biotechnological applications Presents side topics of interest throughout ("gee whiz" topics), to give students quick mental breaks while still extending their knowledge in a practical sense Contains a greatly improved, robust teaching pedagogy to aid student learning, featuring new chapter learning objectives, chapter summaries, highlighted key terms, more end-of-chapter questions, and a new glossary

Summability Theory and Its Applications Sep 23 2020 *Summability Theory and Its Applications* explains various aspects of summability and demonstrates its applications in a rigorous and coherent manner. The content can readily serve as a reference or as a useful series of lecture notes on the subject. This substantially revised new edition includes brand new material across several chapters as well as several corrections, including: the addition of the domain of Cesaro matrix $C(m)$ of order m in the classical sequence spaces to Chapter 4; and introducing the domain of four-dimensional binomial matrix in the spaces of bounded, convergent in the Pringsheim's sense, both convergent in the Pringsheim's sense and bounded, and regularly convergent double sequences, in Chapter 7. Features Investigates different types of summable spaces and computes their dual Suitable for graduate students and researchers with a (special) interest in spaces of single and double sequences, matrix transformations and domains of triangle matrices Can serve as a reference or as supplementary reading in a computational physics course, or as a key text for special Analysis seminars.

An Introduction to Kolmogorov Complexity and Its Applications May 12 2022 Briefly, we review the basic elements of computability theory and probability theory that are required. Finally, in order to place the subject in the appropriate historical and conceptual context we trace the main roots of Kolmogorov complexity. This way the stage is set for Chapters 2 and 3, where we introduce the notion of optimal effective descriptions of objects. The length of such a description (or the number of bits of information in it) is its Kolmogorov complexity. We treat all aspects of the elementary mathematical theory of Kolmogorov complexity. This body of knowledge may be called algorithmic complexity theory. The theory of Martin-Lof tests for randomness of finite objects and infinite sequences is inextricably intertwined with the theory of Kolmogorov complexity and is completely treated. We also investigate the statistical properties of finite strings with high Kolmogorov complexity. Both of these topics are eminently useful in the applications part of the book. We also investigate the recursion theoretic properties of Kolmogorov complexity (relations with Godel's incompleteness result), and the Kolmogorov complexity version of information theory, which we may call "algorithmic information theory" or "absolute information theory." The treatment of algorithmic probability theory in Chapter 4 presupposes Sections 1.6, 1.11.2, and

Chapter 3 (at least Sections 3. 1 through 3. 4).

AC and DC Network Theory Jun 13 2022 Whatever the field of human activity-domestic or scientific, work or leisure-it is likely that some knowledge of the behaviour of electrical circuits is required to keep the processes moving, the wheels turning. In many cases, a knowledge of Ohm's law may suffice. In others, an understanding of more complex relationships may be necessary. In this book an attempt is made to provide, in a concise manner, an introduction to the main methods of treating electrical networks, whether they be carrying direct (de) or alternating (ac) electrical currents. Clearly, the range of possible circuits is vast so that the simplifications which are demonstrated in the pages that follow are of great importance to the student. However, to gain the fullest benefit from such a concise presentation, the student must devote some time to the exercises which are provided in Appendix B. The units used throughout the book are those of the International System (or SI). The various quantities which are introduced-such as current and potential and resistance-are summarized in Appendix A together with the symbols used to represent them, the unit associated with each quantity and the formula used to derive that unit from four fundamental or MKSA units.

Machine Learning and Its Applications Feb 21 2023 In recent years machine learning has made its way from artificial intelligence into areas of administration, commerce, and industry. Data mining is perhaps the most widely known demonstration of this migration, complemented by less publicized applications of machine learning like adaptive systems in industry, financial prediction, medical diagnosis and the construction of user profiles for Web browsers. This book presents the capabilities of machine learning methods and ideas on how these methods could be used to solve real-world problems. The first ten chapters assess the current state of the art of machine learning, from symbolic concept learning and conceptual clustering to case-based reasoning, neural networks, and genetic algorithms. The second part introduces the reader to innovative applications of ML techniques in fields such as data mining, knowledge discovery, human language technology, user modeling, data analysis, discovery science, agent technology, finance, etc.

H? Control and Its Applications Nov 06 2021 H... control theory is a subject that deals with the minimisation of the H... norm of the transfer matrix from an exogenous disturbance to a pertinent controlled output of a given plant. H... Control and Its Applications examines both the theoretical and practical aspects of H... control from the angle of the structural properties of linear systems. Constructive algorithms for finding solutions to general singular H... control problems are presented, as well as solutions to general H... almost disturbance decoupling problems, and the applications of the theory to real-life problems with actual implementations is also presented. The book deals with all such issues for general continuous - and discrete-time systems. The book can be used in graduate courses in departments of aeronautics and astronautics, applied mathematics, chemical engineering, electrical engineering and mechanical engineering. It is also invaluable for practising engineers in industry.

Credit Scoring and Its Applications, Second Edition Aug 03 2021 Credit Scoring and Its Applications?is recognized as the bible of credit scoring. It contains a comprehensive review of the objectives, methods, and practical implementation of credit and behavioral scoring. The authors review principles of the statistical and operations research methods used in building scorecards, as well as the advantages and disadvantages of each approach. The book contains a description of practical problems encountered in building, using, and monitoring scorecards and examines some of the country-specific issues in bankruptcy, equal opportunities, and privacy legislation. It contains a discussion of economic theories of consumers' use of credit, and readers will gain an understanding of what lending institutions seek to achieve by using credit scoring and the changes in their objectives.? New to the second edition are lessons that can be learned for operations research model building from the global financial crisis,

current applications of scoring, discussions on the Basel Accords and their requirements for scoring, new methods for scorecard building and new expanded sections on ways of measuring scorecard performance. And survival analysis for credit scoring. Other unique features include methods of monitoring scorecards and deciding when to update them, as well as different applications of scoring, including direct marketing, profit scoring, tax inspection, prisoner release, and payment of fines.?

Game Theory and Its Applications Apr 30 2021 This book integrates the fundamentals, methodology, and major application fields of noncooperative and cooperative games including conflict resolution. The topics addressed in the book are discrete and continuous games including games represented by finite trees; matrix and bimatrix games as well as oligopolies; cooperative solution concepts; games under uncertainty; dynamic games and conflict resolution. The methodology is illustrated by carefully chosen examples, applications and case studies which are selected from economics, social sciences, engineering, the military and homeland security. This book is highly recommended to readers who are interested in the in-depth and up-to-date integration of the theory and ever-expanding application areas of game theory.

Machine Learning and Its Applications Jan 20 2023 In recent years, machine learning has gained a lot of interest. Due to the advances in processor technology and the availability of large amounts of data, machine learning techniques have provided astounding results in areas such as object recognition or natural language processing. New approaches, e.g. deep learning, have provided groundbreaking outcomes in fields such as multimedia mining or voice recognition. Machine learning is now used in virtually every domain and deep learning algorithms are present in many devices such as smartphones, cars, drones, healthcare equipment, or smart home devices. The Internet, cloud computing and the Internet of Things produce a tsunami of data and machine learning provides the methods to effectively analyze the data and discover actionable knowledge. This book describes the most common machine learning techniques such as Bayesian models, support vector machines, decision tree induction, regression analysis, and recurrent and convolutional neural networks. It first gives an introduction into the principles of machine learning. It then covers the basic methods including the mathematical foundations. The biggest part of the book provides common machine learning algorithms and their applications. Finally, the book gives an outlook into some of the future developments and possible new research areas of machine learning and artificial intelligence in general. This book is meant to be an introduction into machine learning. It does not require prior knowledge in this area. It covers some of the basic mathematical principle but intends to be understandable even without a background in mathematics. It can be read chapter wise and intends to be comprehensible, even when not starting in the beginning. Finally, it also intends to be a reference book. Key Features: Describes real world problems that can be solved using Machine Learning Provides methods for directly applying Machine Learning techniques to concrete real world problems Demonstrates how to apply Machine Learning techniques using different frameworks such as TensorFlow, MALLET, R

Computational Science and Its Applications Jul 22 2020 Computational science is a rapidly growing multidisciplinary field concerned with the design, implementation, and use of mathematical models to analyze and solve real-world problems. It is an area of science that spans many disciplines and which involves the development of models and allows the use of computers to perform simulations or numerical analysis to understand problems that are computational and theoretical. Computational Science and its Applications provides an opportunity for readers to develop abilities to pose and solve problems that combine insights from one or more disciplines from the natural sciences with mathematical tools and computational skills. This requires a unique combination of applied and theoretical knowledge and skills. The topics covered in this edited

book are applications of wavelet and fractals, modeling by partial differential equations on flat structure as well as on graphs and networks, computational linguistics, prediction of natural calamities and diseases like epilepsy seizure, heart attack, stroke, biometrics, modeling through inverse problems, interdisciplinary topics of physics, mathematics, and medical science, and modeling of terrorist attacks and human behavior. The focus of this book is not to educate computer specialists, but to provide readers with a solid understanding of basic science as well as an integrated knowledge on how to use essential methods from computational science. Features: Modeling of complex systems Cognitive computing systems for real-world problems Presentation of inverse problems in medical science and their numerical solutions Challenging research problems in many areas of computational science This book could be used as a reference book for researchers working in theoretical research as well as those who are doing modeling and simulation in such disciplines as physics, biology, geoscience, and mathematics, and those who have a background in computational science.

Mathematical Analysis and Its Applications Jan 08 2022 Mathematical Analysis and its Applications covers the proceedings of the International Conference on Mathematical Analysis and its Applications. The book presents studies that discuss several mathematical analysis methods and their respective applications. The text presents 38 papers that discuss topics, such as approximation of continuous functions by ultraspherical series and classes of bi-univalent functions. The representation of multipliers of eigen and joint function expansions of nonlocal spectral problems for first- and second-order differential operators is also discussed. The book will be of great interest to researchers and professionals whose work involves the use of mathematical analysis.

Basic Digital Electronics Sep 16 2022 Modern electronics is the most visible result of research in solid state physics. Transistors and integrated circuits are used everywhere in ever increasing numbers. The microprocessor controlled coffee-pot exists. Most experimental physicists, and, indeed, experimental scientists in most disciplines, study their subject with the aid of apparatus containing significant amounts of electronics and much of that electronics is digital. In order to design experiments and apparatus or simply to understand how a piece of equipment works, an understanding of electronics has become increasingly important. In recognition that electronics has pervaded so many areas, courses in digital electronics are now a recommended part of physics and many other science degree courses. At the introductory level, digital electronics is, primarily, a practical subject with relatively few basic concepts and any complexity arises from the coupling together of many simple circuits and the extensive use of feedback. Designing an electronic circuit and then getting it to work correctly provides an experience, and a sense of achievement, which is significantly different from most undergraduate work as it more closely resembles project work than standard laboratory practicals.

Time Series Analysis and Its Applications Nov 25 2020 Geared to people involved in statistics, medicine, engineering, and economics, this book offers a basic introduction to time series analysis, providing a balanced and comprehensive treatment of time and frequency domain methods, with accompanying theory. Examples throughout deal with practical, real-world situations.

Linear Algebra Jun 20 2020 "This book is intended for first- and second-year undergraduates arriving with average mathematics grades ... The strength of the text is in the large number of examples and the step-by-step explanation of each topic as it is introduced. It is compiled in a way that allows distance learning, with explicit solutions to all of the set problems freely available online <http://www.oup.co.uk/companion/singh>" -- From preface.

Geometry and its Applications Oct 17 2022 This volume has been divided into two parts: Geometry and Applications. The geometry portion of the book relates primarily to geometric flows, laminations, integral formulae, geometry of vector fields on Lie groups and osculation; the articles in the applications portion concern some particular problems of the theory of dynamical systems, including mathematical problems of liquid flows and a study of cycles for non-dynamical systems. This Work is based on the second international workshop entitled "Geometry and Symbolic Computations," held on May 15-18, 2013 at the University of Haifa and is dedicated to modeling (using symbolic calculations) in differential geometry and its applications in fields such as computer science, tomography and mechanics. It is intended to create a forum for students and researchers in pure and applied geometry to promote discussion of modern state-of-the-art in geometric modeling using symbolic programs such as Maple™ and Mathematica®, as well as presentation of new results.

The Schur Complement and Its Applications Oct 13 2019 This book describes the Schur complement as a rich and basic tool in mathematical research and applications and discusses many significant results that illustrate its power and fertility. Coverage includes historical development, basic properties, eigenvalue and singular value inequalities, matrix inequalities in both finite and infinite dimensional settings, closure properties, and applications in statistics, probability, and numerical analysis.

Electrons in Metals and Semiconductors Oct 05 2021 Solid-state physics has for many years been one of the largest and most active areas of research in physics, and the physics of metals and semiconductors has in turn been one of the largest and most active areas in solid-state physics. Despite this, it is an area in which new and quite unexpected phenomena - such as the quantum Hall effect - are still being discovered, and in which many things are not yet fully understood. It forms an essential part of any undergraduate physics course. A number of textbooks on solid-state physics have appeared over the years and, because the subject has now grown so large, the books too have usually been large. By aiming at a more limited range of topics, I have tried in this book to cover them within a reasonably small compass. But I have also tried to avoid the phrase 'It can be shown that. . .', as far as possible, and instead to explain to the reader just why things are the way they are; and sometimes this takes a little longer. I hope that some readers at least will find this approach helpful. 1 The free-electron model 1. 1 THE CLASSICAL DRUDE THEORY The characteristic properties of metals and semiconductors are due to their conduction electrons: the electrons in the outermost atomic shells, which in the solid state are no longer bound to individual atoms, but are free to wander through the solid.

Group Theory and Its Applications in Physics Sep 04 2021 This book has been written to introduce readers to group theory and its applications in atomic physics, molecular physics, and solid-state physics. The first Japanese edition was published in 1976. The present English edition has been translated by the authors from the revised and enlarged edition of 1980. In translation, slight modifications have been made in Chaps. 8 and 14 to update and condense the contents, together with some minor additions and improvements throughout the volume. The authors cordially thank Professor J. L. Birman and Professor M. Car dona, who encouraged them to prepare the English translation. Tokyo, January 1990 T. Inui . Y. Tanabe Y. Onodera Preface to the Japanese Edition As the title shows, this book has been prepared as a textbook to introduce readers to the applications of group theory in several fields of physics. Group theory is, in a nutshell, the mathematics of symmetry. It has three main areas of application in modern physics. The first originates from early studies of crystal morphology and constitutes a framework for classical crystal physics. The analysis of the symmetry of tensors representing macroscopic physical properties (such as elastic constants) belongs to this category. The second area was enunciated by E. Wigner (1926) as a powerful means of handling quantum-mechanical problems and was first

applied in this sense to the analysis of atomic spectra. Soon, H.

Machine Learning and Its Applications Dec 07 2021 In recent years machine learning has made its way from artificial intelligence into areas of administration, commerce, and industry. Data mining is perhaps the most widely known demonstration of this migration, complemented by less publicized applications of machine learning like adaptive systems in industry, financial prediction, medical diagnosis and the construction of user profiles for Web browsers. This book presents the capabilities of machine learning methods and ideas on how these methods could be used to solve real-world problems. The first ten chapters assess the current state of the art of machine learning, from symbolic concept learning and conceptual clustering to case-based reasoning, neural networks, and genetic algorithms. The second part introduces the reader to innovative applications of ML techniques in fields such as data mining, knowledge discovery, human language technology, user modeling, data analysis, discovery science, agent technology, finance, etc.

Deep Learning and Its Applications May 20 2020 "In just the past five years, deep learning has taken the world by surprise, driving rapid progress in fields as diverse as computer vision, natural language processing, automatic speech recognition, etc. This book presents an introduction to deep learning and various applications of deep learning such as recommendation systems, text recognition, diabetic retinopathy prediction of breast cancer, prediction of epilepsy, sentiment, fake news detection, software defect prediction and protein function prediction"--

Graph Theory and Its Applications to Problems of Society Dec 27 2020 Explores modern topics in graph theory and its applications to problems in transportation, genetics, pollution, perturbed ecosystems, urban services, and social inequalities. The author presents both traditional and relatively atypical graph-theoretical topics to best illustrate applications.

Nonlinear Functional Analysis and Its Applications Nov 13 2019 This book consists of nine papers covering a number of basic ideas, concepts, and methods of nonlinear analysis, as well as some current research problems. Thus, the reader is introduced to the fascinating theory around Brouwer's fixed point theorem, to Granas' theory of topological transversality, and to some advanced techniques of critical point theory and fixed point theory. Other topics include discontinuous differential equations, new results of metric fixed point theory, robust tracker design problems for various classes of nonlinear systems, and periodic solutions in computer virus propagation models.

Boolean Algebra and Its Applications Nov 18 2022 Introductory treatment begins with set theory and fundamentals of Boolean algebra, proceeding to concise accounts of applications to symbolic logic, switching circuits, relay circuits, binary arithmetic, and probability theory. 1961 edition.

Internet of Things and Its Applications Aug 23 2020 This book offers a holistic approach to the Internet of Things (IoT) model, covering both the technologies and their applications, focusing on uniquely identifiable objects and their virtual representations in an Internet-like structure. The authors add to the rapid growth in research on IoT communications and networks, confirming the scalability and broad reach of the core concepts. The book is filled with examples of innovative applications and real-world case studies. The authors also address the business, social, and legal aspects of the Internet of Things and explore the critical topics of security and privacy and their challenges for both individuals and organizations. The contributions are from international experts in academia, industry, and research.

Classical Optics and Its Applications Apr 18 2020 Covering a broad range of fundamental topics in classical optics and electro-magnetism, this updated, second edition contains 13 new chapters, which cover many topics of fundamental significance as well as practical importance. The first

half of the book deals primarily with the basic concepts of optics, while the second half describes how these concepts can be used in a variety of technological applications. Each chapter is concerned with a single topic, developing an understanding of the subject through the use of diagrams, examples, numerical simulations, and logical arguments. The mathematical content is kept to a minimum to provide the reader with insightful discussions of optical phenomena.

Discrete Mathematics and Its Applications Feb 09 2022 The companion Web site -- To the student -- The foundations : logic, sets, and functions -- The fundamentals : algorithms, the integers, and matrices -- Mathematical reasoning -- Counting -- Advanced counting techniques -- Relations -- Graphs -- Trees -- Boolean algebra -- Modeling computation

Structured Light and Its Applications Jun 01 2021 New possibilities have recently emerged for producing optical beams with complex and intricate structures, and for the non-contact optical manipulation of matter. Structured Light and Its Applications fully describes the electromagnetic theory, optical properties, methods and applications associated with this new technology. Detailed discussions are given of unique beam characteristics, such as optical vortices and other wavefront structures, the associated phase properties and photonic aspects, along with applications ranging from cold atom manipulation to optically driven micromachines. Features include: Comprehensive and authoritative treatments of the latest research in this area of nanophotonics, written by the leading researchers Accounts of numerous microfluidics, nanofabrication, quantum informatics and optical manipulation applications Coverage that fully spans the subject area, from fundamental theory and simulations to experimental methods and results Graduate students and established researchers in academia, national laboratories and industry will find this book an invaluable guide to the latest technologies in this rapidly developing field. Comprehensive and definitive source of the latest research in nanotechnology written by the leading people in the field From theory to applications - all is presented in detail Editor is Chair of the SPIE Nanotechnology Technical Group and is leading the way in generation and manipulation of complex beams

An Introduction to Kolmogorov Complexity and Its Applications Mar 30 2021 Briefly, we review the basic elements of computability theory and probability theory that are required. Finally, in order to place the subject in the appropriate historical and conceptual context we trace the main roots of Kolmogorov complexity. This way the stage is set for Chapters 2 and 3, where we introduce the notion of optimal effective descriptions of objects. The length of such a description (or the number of bits of information in it) is its Kolmogorov complexity. We treat all aspects of the elementary mathematical theory of Kolmogorov complexity. This body of knowledge may be called algorithmic complexity theory. The theory of Martin-Lof tests for randomness of finite objects and infinite sequences is inextricably intertwined with the theory of Kolmogorov complexity and is completely treated. We also investigate the statistical properties of finite strings with high Kolmogorov complexity. Both of these topics are eminently useful in the applications part of the book. We also investigate the recursion theoretic properties of Kolmogorov complexity (relations with Godel's incompleteness result), and the Kolmogorov complexity version of information theory, which we may call "algorithmic information theory" or "absolute information theory." The treatment of algorithmic probability theory in Chapter 4 presupposes Sections 1.6, 1.11.2, and Chapter 3 (at least Sections 3.1 through 3.4).

Exponential Sums and their Applications Oct 25 2020 The method of exponential sums is a general method enabling the solution of a wide range of problems in the theory of numbers and its applications. This volume presents an exposition of the fundamentals of the theory with the help of examples which show how exponential sums arise and how they are applied in problems of number theory and its applications. The material is

divided into three chapters which embrace the classical results of Gauss, and the methods of Weyl, Mordell and Vinogradov; the traditional applications of exponential sums to the distribution of fractional parts, the estimation of the Riemann zeta function; and the theory of congruences and Diophantine equations. Some new applications of exponential sums are also included. It is assumed that the reader has a knowledge of the fundamentals of mathematical analysis and of elementary number theory.

Nonstandard Analysis and Its Applications Jul 02 2021 This textbook is an introduction to non-standard analysis and to its many applications. Non standard analysis (NSA) is a subject of great research interest both in its own right and as a tool for answering questions in subjects such as functional analysis, probability, mathematical physics and topology. The book arises from a conference held in July 1986 at the University of Hull which was designed to provide both an introduction to the subject through introductory lectures, and surveys of the state of research. The first part of the book is devoted to the introductory lectures and the second part consists of presentations of applications of NSA to dynamical systems, topology, automata and orderings on words, the non- linear Boltzmann equation and integration on non-standard hulls of vector lattices. One of the book's attractions is that a standard notation is used throughout so the underlying theory is easily applied in a number of different settings. Consequently this book will be ideal for graduate students and research mathematicians coming to the subject for the first time and it will provide an attractive and stimulating account of the subject.

Discrete Mathematics and Its Applications Aug 15 2022 Rosen's Discrete Mathematics and its Applications presents a precise, relevant, comprehensive approach to mathematical concepts. This world-renowned best-selling text was written to accommodate the needs across a variety of majors and departments, including mathematics, computer science, and engineering. As the market leader, the book is highly flexible, comprehensive and a proven pedagogical teaching tool for instructors.

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