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From the reviews: "This book offers a coherent treatment, at the graduate textbook level, of the field that has come to be known in the last decade or so as computational geometry. ... The book is well organized and lucidly written; a timely contribution by two founders of the field. It clearly demonstrates that computational geometry in the plane is now a fairly well-understood branch of computer science and mathematics. It also points the way to the solution of the more challenging problems in dimensions higher than two."

#Mathematical Reviews#1 "... This remarkable book is a comprehensive and systematic study on research results obtained especially in the last ten years. The very clear presentation concentrates on basic ideas, fundamental combinatorial structures, and crucial algorithmic techniques. The plenty of results is clever organized following these guidelines and within the framework of some detailed case studies. A large number of figures and examples also aid the understanding of the material. Therefore, it can be highly recommended as an early graduate text but it should prove also to be essential to researchers and

professionals in applied fields of computer-aided design, computer graphics, and robotics." #Biometrical Journal#2 Sarcomas: Evidence-Based Diagnosis and Management is the most comprehensive clinical reference on sarcomas available to oncologists and trainees. Presenting a compilation of the current knowledge of specific soft tissue and bone sarcomas, this accessible resource on diagnosis and management is the most practical in the market. Led by the world's foremost sarcomas experts in medical oncology, surgical oncology, radiation oncology, gynecologic oncology,

orthopedic surgery, radiology, and pathology, the book addresses the general principles of each major medical discipline, provides details on each major sarcoma subtype, and presents the evidence for standard frontline, adjuvant, and novel treatment approaches such as immunotherapy, cellular therapies, and more. The book begins with general principles of diagnosis and management for each discipline in the field, covering specialties from medical oncology to radiology. Following the chapters on general principles, are chapters characterizing the most prevalent subtypes of sarcoma including their

estimated incidence, common presenting symptoms, diagnostic approach, radiographic features and essential imaging, key diagnostic features, molecular characteristics, approaches to treatment, recommended follow up, the metastatic potential as well as evidence-based therapeutic approaches. Each chapter ends with a summary of caveats, clinical pearls, pitfalls, and solutions as well as a case study from the clinician's point of view. The book ends with chapters focusing on new approaches to treatment and the development of therapeutics to combat sarcoma using immunotherapy, cellular therapy, and

interventional radiology. Numerous tables and disease-based images support the text and provide key information for quick reference. Presenting detailed evidence and authoritative clinical guidance throughout, *Sarcomas* is a "one-stop" guide for any clinician diagnosing, treating, or managing patients suffering from these heterogeneous diseases. Key Features: Provides the standards of care and evidence base for treatment of each major sarcoma subtype Covers all new treatment paradigms and FDA approvals Includes numerous quick reference tables and high-quality color images Presents over 20

practical case studies from leading clinicians in the field The collation of large electronic databases of scientific and commercial information has led to a dramatic growth of interest in methods for discovering structures in such databases. These methods often go under the general name of data mining. One important subdiscipline within data mining is concerned with the identification and detection of anomalous, interesting, unusual, or valuable records or groups of records, which we call patterns. Familiar examples are the detection of fraud in credit-card transactions, of particular coincident purchases in

supermarket transactions, of important nucleotide sequences in gene sequence analysis, and of characteristic traces in EEG records. Tools for the detection of such patterns have been developed within the data mining community, but also within other research communities, typically without an awareness that the basic problem was common to many disciplines. This is not unreasonable: each of these disciplines has a large literature of its own, and a literature which is growing rapidly. Keeping up with any one of these is difficult enough, let alone keeping up with others as well, which may in any case be couched in an

familiar technical language. But, of course, this means that opportunities are being lost, discoveries relating to the common problem made in one area are not transferred to the other area, and breakthroughs and problem solutions are being rediscovered, or not discovered for a long time, meaning that effort is being wasted and opportunities may be lost. This book organizes key concepts, theories, standards, methodologies, trends, challenges and applications of data mining and knowledge discovery in databases. It first surveys, then provides comprehensive yet concise algorithmic descriptions of methods,

including classic methods plus the extensions and novel methods developed recently. It also gives in-depth descriptions of data mining applications in various interdisciplinary industries. Handbook of Artificial Intelligence Techniques in Photovoltaic Systems: Modelling, Control, Optimization, Forecasting and Fault Diagnosis provides readers with a comprehensive and detailed overview of the role of artificial intelligence in PV systems. Covering up-to-date research and methods on how, when and why to use and apply AI techniques in solving most photovoltaic problems, this book will serve as a complete reference in applying

intelligent techniques and algorithms to increase PV system efficiency. Sections cover problem-solving data for challenges, including optimization, advanced control, output power forecasting, fault detection identification and localization, and more. Supported by the use of MATLAB and Simulink examples, this comprehensive illustration of AI-techniques and their applications in photovoltaic systems will provide valuable guidance for scientists and researchers working in this area. Includes intelligent methods in real-time using reconfigurable circuits FPGAs, DSPs and MCs Discusses the newest trends in

AI forecasting, optimization and control applications  
Features MATLAB and Simulink examples highlighted throughout  
This book is purposefully styled as an introductory textbook on circular economy (CE) for the benefit of educators and students of universities. It provides comprehensive knowledge exemplified by practices from policy, education, R&D, innovation, design, production, waste management, business and financing around the world. The book covers sectors such as agriculture/food, packaging materials, build environment, textile, energy, and mobility to inspire the growth of circular

business transformation. It aims to stimulate action among different stakeholders to drive CE transformation. It elaborates critical driving forces of CE including digital technologies; restorative innovations; business opportunities & sustainable business model; financing instruments, regulation & assessment and experiential education programs. It connects a CE transformation for reaching the SDGs2030 and highlights youth leadership and entrepreneurship at all levels in driving the sustainability transformation. This Handbook presents a complete and rigorous overview of the fundamentals, methods and

applications of the multidisciplinary field of Global Navigation Satellite Systems (GNSS), providing an exhaustive, one-stop reference work and a state-of-the-art description of GNSS as a key technology for science and society at large. All global and regional satellite navigation systems, both those currently in operation and those under development (GPS, GLONASS, Galileo, BeiDou, QZSS, IRNSS/NAVIC, SBAS), are examined in detail. The functional principles of receivers and antennas, as well as the advanced algorithms and models for GNSS parameter estimation, are rigorously discussed. The book covers the



broad and diverse range of land, marine, air and space applications, from everyday GNSS to high-precision scientific applications and provides detailed descriptions of the most widely used GNSS format standards, covering receiver formats as well as IGS product and meta-data formats. The full coverage of the field of GNSS is presented in seven parts, from its fundamentals, through the treatment of global and regional navigation satellite systems, of receivers and antennas, and of algorithms and models, up to the broad and diverse range of applications in the areas of positioning and navigation, surveying, geodesy and

geodynamics, and remote sensing and timing. Each chapter is written by international experts and amply illustrated with figures and photographs, making the book an invaluable resource for scientists, engineers, students and institutions alike. 2022 marks the 45th anniversary of the Voyager probe launches. Launched into space in 1977, these twin probes explored the farthest reaches of the Solar System before venturing on a one-way journey beyond, all the while testing the bounds of science, robotic exploration and our collective imagination. This heavily revised commemorative book takes a comprehensive look at their

incredible achievements, future potential and overall legacy. Chronicled herein is an epic journey to unveil the mysterious outer reaches of the Solar System for the first time. The book recounts the Voyagers' travels through the asteroid belt and past the giant gaseous planets Jupiter and Saturn, as well as Voyager 2's forays near the distant ice giants Uranus and Neptune. Each chapter details in full the game-changing scientific data and glorious imagery they sent back to Earth. This new edition incorporates all the new data we have learned in the nearly 20 years since its original publication, discussing how the knowledge first gleaned with

Voyager has been built upon in subsequent decades by Cassini, Juno and New Horizons. The Voyager probes captured imaginations around the world; now is an opportune time to reflect on their unparalleled quest across the edges of the Solar System and the enigmatic interstellar medium beyond. Magnetic bubbles are of interest to engineers because their properties can be used for important practical electronic devices and they are of interest to physicists because their properties are manifestations of intriguing physical principles. At the same time, the fabrication of useful configurations challenges the materials scientists and

engineers. A technology of magnetic bubbles has developed to the point where commercial products are being marketed. In addition, new discovery and development are driving this technology toward substantially lower costs and presumably broader application. For all of these reasons there is a need to educate newcomers to this field in universities and in industry. The purpose of this book is to provide a text for a one-semester course that can be taught under headings of Solid State Physics, Materials Science, Computer Technology or Integrated Electronics. It is expected that the student of anyone of these disciplines will

be interested in each of the chapters of this book to some degree, but may concentrate on some more than others, depending on the discipline. At the end of each chapter there is a brief summary which will serve as a reminder of the contents of the chapter but can also be read ahead of time to determine the depth of your interest in the chapter. This book aims at providing insights into the collagen superfamily and the remarkable diversity of collagen function within the extracellular matrix. Additionally, the mechanisms underlying collagen-related diseases such as dystrophic epidermolysis bullosa, osteogenesis imperfecta, as

well as collagen-related myopathies and neurological disorders are discussed. Collagens are the most abundant extracellular matrix proteins in organisms. Their primary function is to provide structural support and strength to cells and to maintain biomechanical integrity of tissues. However, collagens can no longer be considered just as structural proteins. They can act as extracellular modulators of signaling events and serve critical regulatory roles in various cell functions during embryonic development and adult homeostasis. Furthermore, collagens are associated with a broad spectrum of heritability-related

diseases known as “collagenopathies” that affect a multitude of organs and tissues including sensorial organs. The book is a useful introduction to the field for junior scientists, interested in extracellular matrix research. It is also an interesting read for advanced scientists and clinicians working on collagens and collagenopathies, giving them a broader view of the field beyond their area of specialization. Data Mining and Knowledge Discovery Handbook organizes all major concepts, theories, methodologies, trends, challenges and applications of data mining (DM) and knowledge discovery in

databases (KDD) into a coherent and unified repository. This book first surveys, then provides comprehensive yet concise algorithmic descriptions of methods, including classic methods plus the extensions and novel methods developed recently. This volume concludes with in-depth descriptions of data mining applications in various interdisciplinary industries including finance, marketing, medicine, biology, engineering, telecommunications, software, and security. Data Mining and Knowledge Discovery Handbook is designed for research scientists and graduate-level students in

computer science and engineering. This book is also suitable for professionals in fields such as computing applications, information systems management, and strategic research management. Due to continual progress in the large-scale integration of semiconductor circuits, parallel computing principles can already be met in low-cost systems: numerous examples exist in image processing, for which special hardware is implementable with quite modest resources even by nonprofessional designers. Principles of content addressing, if thoroughly understood, can thereby be applied effectively using

standard components. On the other hand, mass storage based on associative principles still exists only in the long term plans of computer technologists. This situation is somewhat confused by the fact that certain expectations are held for the development of new storage media such as optical memories and "spin glasses" (metal alloys with low-density magnetic impurities). Their technologies, however, may not ripen until after "fifth generation" computers have been built. It seems that software methods for content addressing, especially those based on hash coding principles, are still holding their position firmly, and a few

innovations have been developed recently. As they need no special hardware, one might expect that they will spread to a wide circle of users. This monograph is based on an extensive literature survey, most of which was published in the First Edition. I have added Chap. 7, which contains a review of more recent work. This updated book now has references to over 1200 original publications. In the editing of the new material, I received valuable help from Anneli Heimburger, M. Sc., and Mrs. Leila Koivisto. This handbook offers the first comprehensive reference guide to the interdisciplinary field of model-based reasoning. It

highlights the role of models as mediators between theory and experimentation, and as educational devices, as well as their relevance in testing hypotheses and explanatory functions. The Springer Handbook merges philosophical, cognitive and epistemological perspectives on models with the more practical needs related to the application of this tool across various disciplines and practices. The result is a unique, reliable source of information that guides readers toward an understanding of different aspects of model-based science, such as the theoretical and cognitive nature of models, as well as

their practical and logical aspects. The inferential role of models in hypothetical reasoning, abduction and creativity once they are constructed, adopted, and manipulated for different scientific and technological purposes is also discussed. Written by a group of internationally renowned experts in philosophy, the history of science, general epistemology, mathematics, cognitive and computer science, physics and life sciences, as well as engineering, architecture, and economics, this Handbook uses numerous diagrams, schemes and other visual representations to promote a

better understanding of the concepts. This also makes it highly accessible to an audience of scholars and students with different scientific backgrounds. All in all, the Springer Handbook of Model-Based Science represents the definitive application-oriented reference guide to the interdisciplinary field of model-based reasoning. Natural Computing is the field of research that investigates both human-designed computing inspired by nature and computing taking place in nature, i.e., it investigates models and computational techniques inspired by nature and also it investigates phenomena taking place in

nature in terms of information processing. Examples of the first strand of research covered by the handbook include neural computation inspired by the functioning of the brain; evolutionary computation inspired by Darwinian evolution of species; cellular automata inspired by intercellular communication; swarm intelligence inspired by the behavior of groups of organisms; artificial immune systems inspired by the natural immune system; artificial life systems inspired by the properties of natural life in general; membrane computing inspired by the compartmentalized ways in which cells process

information; and amorphous computing inspired by morphogenesis. Other examples of natural-computing paradigms are molecular computing and quantum computing, where the goal is to replace traditional electronic hardware, e.g., by bioware in molecular computing. In molecular computing, data are encoded as biomolecules and then molecular biology tools are used to transform the data, thus performing computations. In quantum computing, one exploits quantum-mechanical phenomena to perform computations and secure communications more efficiently than classical physics and, hence, traditional

hardware allows. The second strand of research covered by the handbook, computation taking place in nature, is represented by investigations into, among others, the computational nature of self-assembly, which lies at the core of nanoscience, the computational nature of developmental processes, the computational nature of biochemical reactions, the computational nature of bacterial communication, the computational nature of brain processes, and the systems biology approach to bionetworks where cellular processes are treated in terms of communication and interaction, and, hence, in

terms of computation. We are now witnessing exciting interaction between computer science and the natural sciences. While the natural sciences are rapidly absorbing notions, techniques and methodologies intrinsic to information processing, computer science is adapting and extending its traditional notion of computation, and computational techniques, to account for computation taking place in nature around us. Natural Computing is an important catalyst for this two-way interaction, and this handbook is a major record of this important development. "A lot of hard-won knowledge is laid out here in a brief but

informative way. Every topic is well referenced, with citations from both the primary literature and relevant resources from the internet." Review from Nature Chemical Biology Written by the founders of the SPARK program at Stanford University, this book is a practical guide designed for professors, students and clinicians at academic research institutions who are interested in learning more about the drug development process and how to help their discoveries become the novel drugs of the future. Often many potentially transformative basic science discoveries are not pursued because they are deemed 'too

early' to attract industry interest. There are simple, relatively cost-effective things that academic researchers can do to advance their findings to the point that they can be tested in the clinic or attract more industry interest. Each chapter broadly discusses an important topic in drug development, from preclinical work in assay design through clinical trial design, regulatory issues and marketing assessments. After the practical overview provided here, the reader is encouraged to consult more detailed texts on specific topics of interest. "I would actually welcome it if this book's intended audience were broadened even more.

Younger scientists starting out in the drug industry would benefit from reading it and getting some early exposure to parts of the process that they'll eventually have to understand. Journalists covering the industry (especially the small startup companies) will find this book a good reality check for many an over-hopeful press release. Even advanced investors who might want to know what really happens in the labs will find information here that might otherwise be difficult to track down in such a concentrated form." This handbook is an authoritative, comprehensive reference on optical networks, the backbone of today's communication and

information society. The book reviews the many underlying technologies that enable the global optical communications infrastructure, but also explains current research trends targeted towards continued capacity scaling and enhanced networking flexibility in support of an unabated traffic growth fueled by ever-emerging new applications. The book is divided into four parts: Optical Subsystems for Transmission and Switching, Core Networks, Datacenter and Super-Computer Networking, and Optical Access and Wireless Networks. Each chapter is written by world-renown experts that represent academia, industry, and

international government and regulatory agencies. Every chapter provides a complete picture of its field, from entry-level information to a snapshot of the respective state-of-the-art technologies to emerging research trends, providing something useful for the novice who wants to get familiar with the field to the expert who wants to get a concise view of future trends. From the Preface: Blending ideas from operations research, music psychology, music theory, and cognitive science, this book aims to tell a coherent story of how tonality pervades our experience, and hence our models, of music. The story is told through the developmental



stages of the Spiral Array model for tonality, a geometric model designed to incorporate and represent principles of tonal cognition, thereby lending itself to practical applications of tonal recognition, segmentation, and visualization. Mathematically speaking, the coils that make up the Spiral Array model are in effect helices, a spiral referring to a curve emanating from a central point. The use of “spiral” here is inspired by spiral staircases, intertwined spiral staircases: nested double helices within an outer spiral. The book serves as a compilation of knowledge about the Spiral Array model and its applications, and is

written for a broad audience, ranging from the layperson interested in music, mathematics, and computing to the music scientist-engineer interested in computational approaches to music representation and analysis, from the music-mathematical and computational sciences student interested in learning about tonality from a formal modeling standpoint to the computer musician interested in applying these technologies in interactive composition and performance. Some chapters assume no musical or technical knowledge, and some are more musically or computationally involved. The Wheels That Drove New York tells the

fascinating story of how a public transportation system helped transform a small trading community on the southern tip of Manhattan island to a world financial capital that is home to more than 8,000,000 people. From the earliest days of horse-drawn conveyances to the wonders of one of the world's largest and most efficient subways, the story links the developing history of the City itself to the growth and development of its public transit system. Along the way, the key role of played by the inventors, builders, financiers, and managers of the system are highlighted. New York began as a fur trading outpost

run by the Dutch West India Company, established after the discovery and exploration of New York Harbor and its great river by Henry Hudson. It was eventually taken over by the British, and the magnificent harbor provided for a growing center of trade. Trade spurred industry, initially those needed to support the shipping industry, later spreading to various products for export. When DeWitt Clinton built the Erie Canal, which linked New York Harbor to the Great Lakes, New York became the center of trade for all products moving into and out of the mid-west. As industry grew, New York became a magnet for immigrants seeking refuge in a

new land of opportunity. The City's population continued to expand. Both water and land barriers, however, forced virtually the entire population to live south of what is now 14th Street. Densities grew dangerously, and brought both disease and conflict to the poorer quarters of the Five Towns. To expand, the City needed to conquer land and water barriers, primarily with a public transportation system. By the time of the Civil War, the City was at a breaking point. The horse-drawn public conveyances that had provided all of the public transportation services since the 1820's needed to be replaced with something more effective and

efficient. First came the elevated railroads, initially powered by steam engines. With the invention of electricity and the electric traction motor, the elevated's were electrified, and a trolley system emerged. Finally, in 1904, the City opened its first subway. From there, the City's growth to northern Manhattan and to the "outer boroughs" of Brooklyn, Queens, and the Bronx exploded. The Wheels That Drove New York takes us through the present day, and discusses the many challenges that the transit system has had to face over the years. It also traces the conversion of the system from fully private operations (through the

elevated railways) to the fully public system that exists today, and the problems that this transformation has created along the way. Does your IQ really measure your intelligence? Is IQ genetic? Can your IQ vary? Do we get smarter or dumber as we get older? How will IQ tests be different in the future? Dr. Kaufman, a leading expert on the development of IQ tests, explores these critical questions and many more in *IQ Testing 101*. This book provides a brief, compelling introduction to the topic of IQ testing—its mysteries, misconceptions, and truths. This newest edition to the popular *Psych 101 Series* presents a common-sense

approach to what IQ is and what it is not. In lucid, engaging prose, Kaufman explains the nature of IQ testing, as well as where it came from, and where it's going in the future. A quick, fun, even enlightening read, not only for psychologists and educators, but for anyone interested in the study of intelligence. The *Psych 101 Series Short*, reader-friendly introductions to cutting-edge topics in psychology. With key concepts, controversial topics, and fascinating accounts of up-to-the-minute research, The *Psych 101 Series* is a valuable resource for all students of psychology and anyone interested in the field. Mobile

communications and ubiquitous computing generate large volumes of data. Mining this data can produce useful knowledge, yet individual privacy is at risk. This book investigates the various scientific and technological issues of mobility data, open problems, and roadmap. The editors manage a research project called *GeoPKDD*, *Geographic Privacy-Aware Knowledge Discovery and Delivery*, and this book relates their findings in 13 chapters covering all related subjects. Decision trees have become one of the most powerful and popular approaches in knowledge discovery and data mining; it is the science of

exploring large and complex bodies of data in order to discover useful patterns. Decision tree learning continues to evolve over time. Existing methods are constantly being improved and new methods introduced. This 2nd Edition is dedicated entirely to the field of decision trees in data mining; to cover all aspects of this important technique, as well as improved or new methods and techniques developed after the publication of our first edition. In this new edition, all chapters have been revised and new topics brought in. New topics include Cost-Sensitive Active Learning, Learning with Uncertain and Imbalanced Data, Using

Decision Trees beyond Classification Tasks, Privacy Preserving Decision Tree Learning, Lessons Learned from Comparative Studies, and Learning Decision Trees for Big Data. A walk-through guide to existing open-source data mining software is also included in this edition. This book invites readers to explore the many benefits in data mining that decision trees offer: Data Mining is the science and technology of exploring large and complex bodies of data in order to discover useful patterns. It is extremely important because it enables modeling and knowledge extraction from abundant data availability. This

book introduces soft computing methods extending the envelope of problems that data mining can solve efficiently. It presents practical soft-computing approaches in data mining and includes various real-world case studies with detailed results. The second edition of this handbook provides a state-of-the-art overview on the various aspects in the rapidly developing field of robotics. Reaching for the human frontier, robotics is vigorously engaged in the growing challenges of new emerging domains. Interacting, exploring, and working with humans, the new generation of robots will increasingly touch

people and their lives. The credible prospect of practical robots among humans is the result of the scientific endeavour of a half a century of robotic developments that established robotics as a modern scientific discipline. The ongoing vibrant expansion and strong growth of the field during the last decade has fueled this second edition of the Springer Handbook of Robotics. The first edition of the handbook soon became a landmark in robotics publishing and won the American Association of Publishers PROSE Award for Excellence in Physical Sciences & Mathematics as well as the organization's Award for

Engineering & Technology. The second edition of the handbook, edited by two internationally renowned scientists with the support of an outstanding team of seven part editors and more than 200 authors, continues to be an authoritative reference for robotics researchers, newcomers to the field, and scholars from related disciplines. The contents have been restructured to achieve four main objectives: the enlargement of foundational topics for robotics, the enlightenment of design of various types of robotic systems, the extension of the treatment on robots moving in the environment, and the

enrichment of advanced robotics applications. Further to an extensive update, fifteen new chapters have been introduced on emerging topics, and a new generation of authors have joined the handbook's team. A novel addition to the second edition is a comprehensive collection of multimedia references to more than 700 videos, which bring valuable insight into the contents. The videos can be viewed directly augmented into the text with a smartphone or tablet using a unique and specially designed app. Springer Handbook of Robotics Multimedia Extension Portal: <http://handbookofrobotics.org/> The handbook comprehensively

covers the field of inorganic photochemistry from the fundamentals to the main applications. The first section of the book describes the historical development of inorganic photochemistry, along with the fundamentals related to this multidisciplinary scientific field. The main experimental techniques employed in state-of-art studies are described in detail in the second section followed by a third section including theoretical investigations in the field. In the next three sections, the photophysical and photochemical properties of coordination compounds, supramolecular systems and inorganic semiconductors are

summarized by experts on these materials. Finally, the application of photoactive inorganic compounds in key sectors of our society is highlighted. The sections cover applications in bioimaging and sensing, drug delivery and cancer therapy, solar energy conversion to electricity and fuels, organic synthesis, environmental remediation and optoelectronics among others. The chapters provide a concise overview of the main achievements in the recent years and highlight the challenges for future research. This handbook offers a unique compilation for practitioners of inorganic photochemistry in both industry and academia.

Numbers imitate space, which is of such a different nature —Blaise Pascal It is fair to date the study of the foundation of mathematics back to the ancient Greeks. The urge to understand and systematize the mathematics of the time led Euclid to postulate axioms in an early attempt to put geometry on a firm footing. With roots in the Elements, the distinctive methodology of mathematics has become proof. Inevitably two questions arise: What are proofs? and What assumptions are proofs based on? The first question, traditionally an internal question of the field of logic, was also wrestled with in antiquity. Aristotle gave his

famous syllogistic systems, and the Stoics had a nascent propositional logic. This study continued with Boethius and starts, through Boethius, the Arabs and the medieval logicians in Paris and London. The early germs of logic emerged in the context of philosophy and theology. The development of analytic geometry, as exemplified by Descartes, illustrated the difficulties inherent in founding mathematics. It is classically phrased as the question of how one reconciles the arithmetic with the geometric. Are numbers one type of thing and geometric objects another? What are the relationships between these two types of

objects? How can they interact? Discovery of new types of mathematical objects, such as imaginary numbers and, much later, formal objects such as free groups and formal power series make the problem of finding a common playing field for all of mathematics importunate. Several pressures made foundational issues urgent in the 19th century. "This 10-volume compilation of authoritative, research-based articles contributed by thousands of researchers and experts from all over the world emphasized modern issues and the presentation of potential opportunities, prospective solutions, and future directions in the field of information

science and technology"-- Provided by publisher. Helps healthcare professionals to navigate the maze of information and disinformation about medical cannabis. Written for all healthcare professionals who are considering including medical cannabis in their treatment plans, this is the first handbook to disseminate all the information needed to advise patients safely and legally. Replete with evidence-based guidelines firmly grounded in the most up-to-date research, this resource covers the historical, legal, and biological context of medical cannabis so healthcare professionals can confidently discuss possible plans with their patients.

Medical Cannabis Handbook for Healthcare Professionals delves into the biology of the endocannabinoid system addressing how cannabis interacts with the body, its effects and side effects, and how to manage cannabis-drug interactions. Chapters discuss in detail how to talk to patients, what language providers can and cannot use, protocols for patient-centered dosing, and the variety of available cannabinoid pharmaceuticals. Based on the latest research, this book demonstrates the efficacy of cannabis in treating a broad range of symptoms and conditions. Written for any healthcare professional who might have to answer patient

questions about medical cannabis, this handbook dispels common myths and confirms little-known facts about medical cannabis. KEY FEATURES: Delivers the most up-to-date, evidence-based research on medical cannabis to enhance understanding of this complex topic Provides historical, legal, and biological content so that healthcare providers can confidently discuss medical cannabis with patients Dispels common cannabis myths and misinformation Discusses pain management regarding cannabis and opioids Co-published with Medical Marijuana 411, the leading medical cannabis education

provider to offer online CME, CPE and CNE courses to health professionals worldwide; and required certifications for dispensary consultants This book organizes key concepts, theories, standards, methodologies, trends, challenges and applications of data mining and knowledge discovery in databases. It first surveys, then provides comprehensive yet concise algorithmic descriptions of methods, including classic methods plus the extensions and novel methods developed recently. It also gives in-depth descriptions of data mining applications in various interdisciplinary industries. Apollo was known for its



engineering triumphs, but its success also came from a disciplined management style. This excellent account of one of the most important personalities in early American human spaceflight history describes for the first time how George E. Mueller, the system manager of the human spaceflight program of the 1960s, applied the SPO methodology and other special considerations such as “all-up” testing, resulting in the success of the Apollo Program. Wernher von Braun and others did not readily accept such testing or Mueller’s approach to system management, but later acknowledged that without them NASA would not

have landed astronauts on the Moon by 1969. While Apollo remained Mueller’s priority, from his earliest days at the agency, he promoted a robust post-Apollo Program which resulted in Skylab, the Space Shuttle and the International Space Station. As a result of these efforts, Mueller earned the sobriquet: “the father of the space shuttle.” Following his success at NASA, Mueller returned to industry. Although he did not play a leading role in human spaceflight again, in 2011 the National Air and Space Museum awarded him their lifetime achievement trophy for his contributions. Following the contributions of George E. Mueller, in this

unique book Arthur L. Slotkin answers such questions as: exactly how did the methods developed for use in the Air Force ballistic missile programs get modified and used in the Apollo Program? How did George E. Mueller, with the help of others, manage the Apollo Program? How did NASA centers, coming from federal agencies with cultures of their own, adapt to the new structured approach imposed from Washington? George E. Mueller is the ideal central character for this book. He was instrumental in the creation of Apollo extension systems leading to Apollo, the Shuttle, and today’s ISS and thus was a pivotal figure in early American

human spaceflight history. Make sense of college admissions and prepare a successful application Admission Matters offers comprehensive, expert, and practical advice for parents and students to guide them through the college admissions process. From building a college list, to understanding standardized tests, to obtaining financial aid, to crafting personal statements, to making a final decision, this book guides you every step of the way with clear, sensible advice and practical tips. This new fourth edition has been completely updated to reflect the latest changes in college admissions, including new developments in

standardized testing, applications, financial aid and more. Questionnaires, interactive forms, checklists, and other tools help you stay focused and organized throughout the process.. With the answers you need and a down-to-earth perspective, this book provides an invaluable resource for stressed-out students and parents everywhere. Applying to college can be competitive and complex. Admission Matters offers real-world expert advice for all students, whether you're aiming an Ivy or the state school close to home. It also includes much needed guidance for students with special circumstances,

including students with disabilities, international students, and transfer students. In addition, athletes, artists and performers, and homeschoolers will find valuable guidance as they plan for and apply to college. Understand how the admissions process works and what you can and cannot control Learn how to build a strong list of good-fit colleges Craft a strong application package with a compelling personal statement Get expert advice on early admissions, financial aid, standardized testing, and much more Make a final decision that is the right one for you Whether you think you've got applying to college

under control or don't even know where to begin, Admission Matters is your expert guide throughout the college admissions process. The first comprehensive overview of preprocessing, mining, and postprocessing of biological data Molecular biology is undergoing exponential growth in both the volume and complexity of biological data—and knowledge discovery offers the capacity to automate complex search and data analysis tasks. This book presents a vast overview of the most recent developments on techniques and approaches in the field of biological knowledge discovery and data mining

(KDD)—providing in-depth fundamental and technical field information on the most important topics encountered. Written by top experts, Biological Knowledge Discovery Handbook: Preprocessing, Mining, and Postprocessing of Biological Data covers the three main phases of knowledge discovery (data preprocessing, data processing—also known as data mining—and data postprocessing) and analyzes both verification systems and discovery systems. BIOLOGICAL DATA PREPROCESSING Part A: Biological Data Management Part B: Biological Data Modeling Part C: Biological

Feature Extraction Part D Biological Feature Selection BIOLOGICAL DATA MINING Part E: Regression Analysis of Biological Data Part F Biological Data Clustering Part G: Biological Data Classification Part H: Association Rules Learning from Biological Data Part I: Text Mining and Application to Biological Data Part J: High-Performance Computing for Biological Data Mining Combining sound theory with practical applications in molecular biology, Biological Knowledge Discovery Handbook is ideal for courses in bioinformatics and biological KDD as well as for practitioners and professional researchers in

computer science, life science, and mathematics. Taken literally, the title "All of Statistics" is an exaggeration. But in spirit, the title is apt, as the book does cover a much broader range of topics than a typical introductory book on mathematical statistics. This book is for people who want to learn probability and statistics quickly. It is suitable for graduate or advanced undergraduate students in computer science, mathematics, statistics, and related disciplines. The book includes modern topics like non-parametric curve estimation, bootstrapping, and classification, topics that are usually relegated to follow-up

courses. The reader is presumed to know calculus and a little linear algebra. No previous knowledge of probability and statistics is required. Statistics, data mining, and machine learning are all concerned with collecting and analysing data. Data Mining is the science and technology of exploring data in order to discover previously unknown patterns. It is a part of the overall process of Knowledge Discovery in Databases (KDD). The accessibility and abundance of information today makes data mining a matter of considerable importance and necessity. This book provides an introduction to the field with

an emphasis on advanced decomposition methods in general data mining tasks and for classification tasks in particular. The book presents a complete methodology for decomposing classification problems into smaller and more manageable sub-problems that are solvable by using existing tools. The various elements are then joined together to solve the initial problem. The benefits of decomposition methodology in data mining include: increased performance (classification accuracy); conceptual simplification of the problem; enhanced feasibility for huge databases; clearer and more comprehensible results;

reduced runtime by solving smaller problems and by using parallel/distributed computation; and the opportunity of using different techniques for individual sub-problems. This handbook delivers an up-to-date, comprehensive and authoritative coverage of the broad field of surface science, encompassing a range of important materials such as metals, semiconductors, insulators, ultrathin films and supported nanoobjects. Over 100 experts from all branches of experiment and theory review in 39 chapters all major aspects of solid-state surfaces, from basic principles to applications, including the

latest, ground-breaking research results. Beginning with the fundamental background of kinetics and thermodynamics at surfaces, the handbook leads the reader through the basics of crystallographic structures and electronic properties, to the advanced topics at the forefront of current research. These include but are not limited to novel applications in nanoelectronics, nanomechanical devices, plasmonics, carbon films, catalysis, and biology. The handbook is an ideal reference guide and instructional aid for a wide range of physicists, chemists, materials scientists and engineers active

throughout academic and industrial research. Organizes major concepts, theories, methodologies, trends, challenges and applications of data mining (DM) and knowledge discovery in databases (KDD). This book provides algorithmic descriptions of classic methods, and also suitable for professionals in fields such as computing applications, information systems management, and more. This handbook presents fundamental knowledge on the hardware/software (HW/SW) codesign methodology. Contributing expert authors look at key techniques in the design flow as well as selected

codesign tools and design environments, building on basic knowledge to consider the latest techniques. The book enables readers to gain real benefits from the HW/SW codesign methodology through explanations and case studies which demonstrate its usefulness. Readers are invited to follow the progress of design techniques through this work, which assists readers in following current research directions and learning about state-of-the-art techniques. Students and researchers will appreciate the wide spectrum of subjects that belong to the design methodology from this handbook. This handbook incorporates new developments

in automation. It also presents a widespread and well-structured conglomeration of new emerging application areas, such as medical systems and health, transportation, security and maintenance, service, construction and retail as well as production or logistics. The handbook is not only an ideal resource for automation experts but also for people new to this expanding field. The Space Age is nearly 50 years old but exploration of the outer planets and beyond has only just begun. Deep-Space Probes Second Edition draws on the latest research to explain why we should explore beyond the edge of the Solar System and how we can build

highly sophisticated robot spacecraft to make the journey. Many technical problems remain to be solved, among them propulsion systems to permit far higher velocities, and technologies to build vehicles a fraction of the size of today's spacecraft. Beyond the range of effective radio control, robot vehicles for exploring deep space will need to be intelligent, 'thinking' craft - able to make vital decisions entirely on their own. Gregory Matloff also looks at the possibility for human travel into interstellar space, and some of the immense problems that such journeys would entail. This second edition includes an entirely new

chapter on holographic  
message plaques for future

interstellar probes - a NASA-  
funded project.

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