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Mathematical Modelling and Applications Jan 20 2023 This volume documents on-going research and theorising in the sub-field of mathematics education devoted to the teaching and learning of mathematical modelling and applications. Mathematical modelling provides a way of conceiving and resolving problems in the life world of people whether these range from the everyday individual numeracy level to sophisticated new problems for society at large. Mathematical modelling and real world applications are considered as having potential for multi-disciplinary work that involves knowledge from a variety of communities of practice such as those in different workplaces (e.g., those of educators, designers, construction engineers, museum curators) and in different fields of academic endeavour (e.g., history, archaeology, mathematics, economics). From an educational perspective, researching the development of competency in real world modelling involves research situated in crossing the boundaries between being a student engaged in modelling or mathematical application to real word tasks in the classroom, being a teacher of mathematical modelling (in or outside the classroom or bridging both), and being a modeller of the world outside the classroom. This is the focus of many of the authors of the chapters in this book. All authors of this volume are members of the International Community of Teachers of Mathematical Modelling (ICTMA), the peak research body into researching the teaching and learning of mathematical modelling at all levels of education from the early years to tertiary education as well as in the workplace.

Landscapes and Landforms of Belgium and Luxembourg Jul 22 2020 This book provides an informative and intriguing overview of the most scenic landscapes of Belgium and Luxembourg. Geodiversity is emphasized, for example the periglacial features in the Hautes Fagnes area, the planation surfaces in the Ardennes and Oesling, and the famous caves of Han/Lesse and Remouchamps. The book's chief goals are to provide the reader with enjoyable and informative descriptions of the selected sites within their regional geographical and geological settings; to offer an up-to-date survey of the evolution of Belgium's and Luxembourg's landscape; and to share additional information on the cultural value of the respective sites wherever appropriate. The book is a richly illustrated reference work that makes accessible for the first time a wealth of information currently scattered among many national and regional journals. It will benefit earth scientists, environmental scientists, tourism geographers and conservationists alike.

Bayesian Nonparametrics Nov 25 2020 Bayesian nonparametrics works - theoretically, computationally. The theory provides highly flexible models whose complexity grows appropriately with the amount of data. Computational issues, though challenging, are no longer intractable. All that is needed is an entry point: this intelligent book is the perfect guide to what can seem a forbidding landscape. Tutorial chapters by Ghosal, Lijoi and Prünster, Teh and Jordan, and Dunson advance from theory, to basic models and hierarchical modeling, to applications and implementation, particularly in computer science and biostatistics. These are complemented by companion chapters by the editors and Griffin and Quintana, providing additional models, examining computational issues, identifying future growth areas, and giving links to related topics. This coherent text gives ready access both to underlying principles and to state-of-the-art practice. Specific examples are drawn from information retrieval, NLP,

machine vision, computational biology, biostatistics, and bioinformatics.

Cuda by Example Feb 15 2020 GPUs can be used for much more than graphics processing. As opposed to a CPU, which can only run four or five threads at once, a GPU is made up of hundreds or even thousands of individual, low-powered cores, allowing it to perform thousands of concurrent operations. Because of this, GPUs can tackle large, complex problems on a much shorter time scale than CPUs. Dive into parallel programming on NVIDIA hardware with CUDA by Chris Rose, and learn the basics of unlocking your graphics card. This updated and expanded second edition of Book provides a user-friendly introduction to the subject, Taking a clear structural framework, it guides the reader through the subject's core elements. A flowing writing style combines with the use of illustrations and diagrams throughout the text to ensure the reader understands even the most complex of concepts. This succinct and enlightening overview is a required reading for all those interested in the subject . We hope you find this book useful in shaping your future career & Business.

Bringing Fusion to the U.S. Grid Aug 23 2020 Fusion energy offers the prospect of addressing the nation's energy needs and contributing to the transition to a low-carbon emission electrical generation infrastructure. Technology and research results from U.S. investments in the major fusion burning plasma experiment known as ITER, coupled with a strong foundation of research funded by the Department of Energy (DOE), position the United States to begin planning for its first fusion pilot plant. Strong interest from the private sector is an additional motivating factor, as the process of decarbonizing and modernizing the nation's electric infrastructure accelerates and companies seek to lead the way. At the request of DOE, Bringing Fusion to the U.S. Grid builds upon the work of the 2019 report Final Report of the Committee on a Strategic Plan for U.S. Burning Plasma Research to identify the key goals and innovations - independent of confinement concept - that are needed to support the development of a U.S. fusion pilot plant that can serve as a model for producing electricity at the lowest possible capital cost.

Creativity and Giftedness Aug 03 2021 This volume provides readers with a broad view on the variety of issues related to the educational research and practices in the field of Creativity in Mathematics and Mathematical Giftedness. The book explores (a) the relationship between creativity and giftedness; (b) empirical work with high ability (or gifted) students in the classroom and its implications for teaching mathematics; (c) interdisciplinary work which views creativity as a complex phenomena that cannot be understood from within the borders of disciplines, i.e., to present research and theorists from disciplines such as neuroscience and complexity theory; and (d) findings from psychology that pertain the creatively gifted students. As a whole, this volume brings together perspectives from mathematics educators, psychologists, neuroscientists, and teachers to present a collection of empirical, theoretical and philosophical works that address the complexity of mathematical creativity and giftedness, its origins, nature, nurture and ways forward. In keeping with the spirit of the series, the anthology substantially builds on previous ZDM volumes on interdisciplinarity (2009), creativity and giftedness (2013).

Nonlinear Perron-Frobenius Theory Feb 26 2021 Guides the reader through the nonlinear Perron-Frobenius theory, introducing them to recent developments and challenging open problems.

Autonomous Control for a Reliable Internet of Services Apr 11 2022 This open access book was prepared as a Final Publication of the COST Action IC1304 "Autonomous Control for a Reliable Internet of Services (ACROSS)". The book contains 14 chapters and constitutes a show-case of the main outcome of the Action in line with its scientific goals. It will serve as a valuable reference for undergraduate and post-graduate students, educators, faculty members, researchers, engineers, and research strategists working in this field. The explosive growth of the Internet has fundamentally changed the global society. The emergence of concepts like SOA, SaaS, PaaS, IaaS, NaaS, and Cloud Computing in general has catalyzed the migration from the information-oriented Internet into an Internet of Services (IoS). This has opened up virtually unbounded possibilities for the

creation of new and innovative services that facilitate business processes and improve the quality of life. However, this also calls for new approaches to ensuring the quality and reliability of these services. The objective of this book is, by applying a systematic approach, to assess the state-of-the-art and consolidate the main research results achieved in this area.

Algorithms - ESA 2015 Dec 07 2021 This book constitutes the refereed proceedings of the 23rd Annual European Symposium on Algorithms, ESA 2015, held in Patras, Greece, in September 2015, as part of ALGO 2015. The 86 revised full papers presented together with two invited lectures were carefully reviewed and selected from 320 initial submissions: 71 out of 261 in Track A, Design and Analysis, and 15 out of 59 in Track B, Engineering and Applications. The papers present real-world applications, engineering, and experimental analysis of algorithms.

Study and Master Life Sciences Grade 11 CAPS Study Guide Jun 20 2020

Open a GLAM Lab Jul 02 2021 A Galleries, Libraries, Archives and Museums (GLAM) Lab is a place for experimenting with digital collections and data. This book describes how to open a GLAM Lab and encourages a movement that can transform organisations and communities.

Applied Analysis in Biological and Physical Sciences Oct 17 2022 The book contains recent developments and contemporary research in mathematical analysis and in its application to problems arising from the biological and physical sciences. The book is of interest to readers who wish to learn of new research in such topics as linear and nonlinear analysis, mathematical biology and ecology, dynamical systems, graph theory, variational analysis and inequalities, functional analysis, differential and difference equations, partial differential equations, approximation theory, and chaos. All papers were prepared by participants at the International Conference on Recent Advances in Mathematical Biology, Analysis and Applications (ICMBAA-2015) held during 4-6 June 2015 in Aligarh, India. A focal theme of the conference was the application of mathematics to the biological sciences and on current research in areas of theoretical mathematical analysis that can be used as sophisticated tools for the study of scientific problems. The conference provided researchers, academicians and engineers with a platform that encouraged them to exchange their innovative ideas in mathematical analysis and its applications as well as to form interdisciplinary collaborations. The content of the book is divided into three parts: Part I contains contributions from participants whose topics are related to nonlinear dynamics and its applications in biological sciences. Part II has contributions which concern topics on nonlinear analysis and its applications to a variety of problems in science, engineering and industry. Part III consists of contributions dealing with some problems in applied analysis.

Language Implementation Patterns Oct 13 2019 Learn to build configuration file readers, data readers, model-driven code generators, source-to-source translators, source analyzers, and interpreters. You don't need a background in computer science--ANTLR creator Terence Parr demystifies language implementation by breaking it down into the most common design patterns. Pattern by pattern, you'll learn the key skills you need to implement your own computer languages. Knowing how to create domain-specific languages (DSLs) can give you a huge productivity boost. Instead of writing code in a general-purpose programming language, you can first build a custom language tailored to make you efficient in a particular domain. The key is understanding the common patterns found across language implementations. Language Design Patterns identifies and condenses the most common design patterns, providing sample implementations of each. The pattern implementations use Java, but the patterns themselves are completely general. Some of the implementations use the well-known ANTLR parser generator, so readers will find this book an excellent source of ANTLR examples as well. But this book will benefit anyone interested in implementing languages, regardless of their tool of choice. Other language implementation books focus on compilers, which you rarely need in your daily life. Instead, Language Design Patterns shows you patterns you can use for all kinds of language applications. You'll learn to create configuration file readers, data readers, model-driven code generators, source-to-source translators, source analyzers, and interpreters. Each chapter groups related design patterns and, in each pattern, you'll get hands-on

experience by building a complete sample implementation. By the time you finish the book, you'll know how to solve most common language implementation problems.

The World Collage Dec 27 2020 The world collage

Breakthrough Aug 15 2022 An inspiring teenage memoir from globally renowned young scientist Jack Andraka. Have you ever had a problem you would give everything to solve — a problem so difficult you would spend years searching for a solution? When Jack Andraka was thirteen, he had a whole pile of problems like this. An outsider at school, he knew he didn't fit in — and a close family friend was dying of cancer. But instead of giving in to the bullying and the despair, he took another path. Using his passion for science, he decided to try to create a better method of cancer detection. After conducting two years of research and asking hundreds of universities and companies for help, to no avail, Jack was finally able to secure the lab space necessary to test out his ingenious idea. In the end, he did it. Jack's early-detection test for pancreatic, ovarian, and lung cancers has the potential to be over four hundred times more effective than the medical standard — and it costs only three cents per use. Jack was just fifteen at the time he came up with his solution. Jack Andraka's story is not just one of inspiring teenage success; it is a story of overcoming depression and homophobic bullying, and of finding the resilience to persevere. Whatever your age and interests, his book will motivate you to pursue your own dreams in the face of resistance, and to never stop learning. Full of fun, simple experiments you can try at home, *Breakthrough* is an amazing personal story and a reminder of why young people's ideas deserve to be heard. PRAISE FOR JACK ANDRAKA 'Funny, brave and super-enthusiastic, with a healthy dose of adolescent egotism and some comic glimpses of the trials of being Jack's parent, *Breakthrough* is an inspiring story for would-be scientists ... just don't complain when they turn your microwave into a ray gun.' The Daily Mail 'The book is pitched at young people and Andraka's geeky charm comes through. So even if he has been over-hyped, in the end what's not to like about a gay nerd doing his bit to show how exciting braininess can be?' The Sydney Morning Herald

Bioinformatics Algorithms Apr 18 2020 *Bioinformatics Algorithms: Design and Implementation in Python* provides a comprehensive book on many of the most important bioinformatics problems, putting forward the best algorithms and showing how to implement them. The book focuses on the use of the Python programming language and its algorithms, which is quickly becoming the most popular language in the bioinformatics field. Readers will find the tools they need to improve their knowledge and skills with regard to algorithm development and implementation, and will also uncover prototypes of bioinformatics applications that demonstrate the main principles underlying real world applications. Presents an ideal text for bioinformatics students with little to no knowledge of computer programming Based on over 12 years of pedagogical materials used by the authors in their own classrooms Features a companion website with downloadable codes and runnable examples (such as using Jupyter Notebooks) and exercises relating to the book

Not Even Wrong Jan 28 2021 When does physics depart the realm of testable hypothesis and come to resemble theology? Peter Woit argues that string theory isn't just going in the wrong direction, it's not even science. *Not Even Wrong* shows that what many physicists call superstring "theory" is not a theory at all. It makes no predictions, not even wrong ones, and this very lack of falsifiability is what has allowed the subject to survive and flourish. Peter Woit explains why the mathematical conditions for progress in physics are entirely absent from superstring theory today, offering the other side of the story.

How Students (mis-) Understand Science and Mathematics Nov 13 2019 In this long-awaited book, Timothy J. Lensmire examines the problems and promise of progressive literacy education. He does this by developing a series of striking metaphors in which, for example, he imagines the writing workshop as a carnival or popular festival and the teacher as a novelist who writes her student-characters into more and less desirable

classroom stories. Grounded in Lensmire's own and others' work in schools, *Powerful Writing, Responsible Teaching* makes powerful use of Bakhtin's theories of language and writing and Dewey's vision of schooling and democracy. Lensmire's book is, at once, a defense, a criticism, and a reconstruction of progressive and critical literacy approaches.

Dictionary Catalog of the Research Libraries of the New York Public Library, 1911-1971 Mar 30 2021

Love and Math Sep 16 2022 An awesome, globe-spanning, and New York Times bestselling journey through the beauty and power of mathematics. What if you had to take an art class in which you were only taught how to paint a fence? What if you were never shown the paintings of van Gogh and Picasso, weren't even told they existed? Alas, this is how math is taught, and so for most of us it becomes the intellectual equivalent of watching paint dry. In *Love and Math*, renowned mathematician Edward Frenkel reveals a side of math we've never seen, suffused with all the beauty and elegance of a work of art. In this heartfelt and passionate book, Frenkel shows that mathematics, far from occupying a specialist niche, goes to the heart of all matter, uniting us across cultures, time, and space. *Love and Math* tells two intertwined stories: of the wonders of mathematics and of one young man's journey learning and living it. Having braved a discriminatory educational system to become one of the twenty-first century's leading mathematicians, Frenkel now works on one of the biggest ideas to come out of math in the last 50 years: the Langlands Program. Considered by many to be a Grand Unified Theory of mathematics, the Langlands Program enables researchers to translate findings from one field to another so that they can solve problems, such as Fermat's last theorem, that had seemed intractable before. At its core, *Love and Math* is a story about accessing a new way of thinking, which can enrich our lives and empower us to better understand the world and our place in it. It is an invitation to discover the magic hidden universe of mathematics.

Video in Qualitative Research Oct 25 2020 Video provides unprecedented opportunities for social science research, enabling fine-grained analysis of social organisation, culture and communication. *Video in Qualitative Research* provides practical guidance for students and academics on how to use video in qualitative research, how to address the problems and issues that arise in undertaking video-based field studies and how to subject video recordings to detailed scrutiny and analysis. Heath, Hindmarsh and Luff consider the ethical and practical issues that arise in recording and gathering data as well as how video enables new and distinctive ways of presenting insights, observations and findings to both academic and practitioner audiences. The book is illustrated throughout with a wide range of case material drawn from the authors own research projects, and these cases serve to situate the practical and methodological guidance offered by the book into real research scenarios. *Video in Qualitative Research* is an invaluable guide for students and researchers across the social sciences thinking of using video as part of their research. Christian Heath is Professor of Work and Organisation, Kings College London Jon Hindmarsh is Reader in Work Practice and Technology, Kings College London Paul Luff is Professor in Organisations and Technology, Kings College London

The Theory of Objectification Jun 01 2021 The theory of objectification offers a perspective to conceptualize learning as a collective cultural-historical process and to transform classrooms into sites of communal life where students make the experience of an ethics of solidarity, plurality, and inclusivity.

Graad R in Perspektief Jan 08 2022 Graad R in Perspektief is 'n gestruktureerde akademiese gids vir studente, opvoeders en praktisyns in die veld van vroeekindontwikkeling. Dit is saamgestel volgens die Kurrikulum- en Assesseringsbeleidsverklaring (KABV) van die Nasionale Onderwysdepartement 2011 en toon die jongste tendense van internasionale bronne. Die fokus lê op die voorbereiding van die student om die beginsels van die informele onderrigbenadering te verstaan en dit te implementeer. Duidelike voorskrifte word gegee om kennis, vaardighede en houdings by die jong kind te ontwikkel sodat elke leerder selfverwesenliking kan bereik. Inligting word voorsien oor die inrigting van die klaskamer

en speelomgewing om vir leerders optimale leergeleenthede te skep. Leerders se verskillende ontwikkelingsvlakke en kulture word in ag geneem. Wenke vir onderrig in die praktyk word toegelig met toepaslike voorbeelde en foto's.

Philosophy and Model Theory Jul 14 2022 Model theory is used in every theoretical branch of analytic philosophy: in philosophy of mathematics, in philosophy of science, in philosophy of language, in philosophical logic, and in metaphysics. But these wide-ranging uses of model theory have created a highly fragmented literature. On the one hand, many philosophically significant results are found only in mathematics textbooks: these are aimed squarely at mathematicians; they typically presuppose that the reader has a serious background in mathematics; and little clue is given as to their philosophical significance. On the other hand, the philosophical applications of these results are scattered across disconnected pockets of papers. The first aim of this book, then, is to explore the philosophical uses of model theory, focusing on the central topics of reference, realism, and doxology. Its second aim is to address important questions in the philosophy of model theory, such as: sameness of theories and structure, the boundaries of logic, and the classification of mathematical structures. *Philosophy and Model Theory* will be accessible to anyone who has completed an introductory logic course. It does not assume that readers have encountered model theory before, but starts right at the beginning, discussing philosophical issues that arise even with conceptually basic model theory. Moreover, the book is largely self-contained: model-theoretic notions are defined as and when they are needed for the philosophical discussion, and many of the most philosophically significant results are given accessible proofs.

Phylogenetic Networks Sep 23 2020 The evolutionary history of species is traditionally represented using a rooted phylogenetic tree. However, when reticulate events such as hybridization, horizontal gene transfer or recombination are believed to be involved, phylogenetic networks that can accommodate non-treelike evolution have an important role to play. This book provides the first interdisciplinary overview of phylogenetic networks. Beginning with a concise introduction to both phylogenetic trees and phylogenetic networks, the fundamental concepts and results are then presented for both rooted and unrooted phylogenetic networks. Current approaches and algorithms available for computing phylogenetic networks from different types of datasets are then discussed, accompanied by examples of their application to real biological datasets. The book also summarises the algorithms used for drawing phylogenetic networks, along with the existing software for their computation and evaluation. All datasets, examples and other additional information and links are available from the book's companion website at www.phylogenetic-networks.org.

The Great Pet Sale Oct 05 2021 A platypus, terrapin and gecko are all at knock down prices. The koalas are 9p a pair. A box of assorted brown things is only 20p. The rat with half his whiskers missing thinks he's the best bargain but what is behind that door ...? .

Optimal Learning May 20 2020 Learn the science of collecting information to make effective decisions Everyday decisions are made without the benefit of accurate information. Optimal Learning develops the needed principles for gathering information to make decisions, especially when collecting information is time-consuming and expensive. Designed for readers with an elementary background in probability and statistics, the book presents effective and practical policies illustrated in a wide range of applications, from energy, homeland security, and transportation to engineering, health, and business. This book covers the fundamental dimensions of a learning problem and presents a simple method for testing and comparing policies for learning. Special attention is given to the knowledge gradient policy and its use with a wide range of belief models, including lookup table and parametric and for online and offline problems. Three sections develop ideas with increasing levels of sophistication: Fundamentals explores fundamental topics, including adaptive learning, ranking and selection, the knowledge gradient, and bandit problems Extensions and Applications features coverage of linear belief models, subset selection models, scalar function optimization, optimal bidding, and stopping problems Advanced Topics explores complex methods including simulation optimization, active learning in mathematical programming, and optimal continuous

measurements Each chapter identifies a specific learning problem, presents the related, practical algorithms for implementation, and concludes with numerous exercises. A related website features additional applications and downloadable software, including MATLAB and the Optimal Learning Calculator, a spreadsheet-based package that provides an introduction to learning and a variety of policies for learning.

The Life and Work of Isidore Snapper (1889-1973) Nov 18 2022 The life of Isidore Snapper (1889-1973), the son of a diamond worker, was defined by ambition, cosmopolitanism, conflict, and antisemitism. As a Professor of Medicine in Amsterdam, Beijing and New York, he played a major role in important developments in medicine during the first half of the last century. He was a medical celebrity who combined supreme bedside skills and diagnostic acumen, masterly integrated with basic science at a time when big egos were still tolerated and accommodated. Never living a boring moment, Snapper acted as a football referee and sport scientist at the Olympic Games in Amsterdam in 1928, was a POW of the Japanese and a consultant to the US War Department, and finally fell in love with a CIA agent. His *Bedside Medicine* became a bestseller. This book presents the story of one of the last great generalists, a race of physicians that is now extinct, and a great champion of the holistic approach to patients. His legacy is still refreshing, topical and challenging for anyone with an interest in all matters of health.

Repetitive Structures in Biological Sequences: Algorithms and Applications Feb 21 2023 Repetitive structures in biological sequences are emerging as an active focus of research and the unifying concept of "repeatome" (the ensemble of knowledge associated with repeating structures in genomic/proteomic sequences) has been recently proposed in order to highlight several converging trends. One main trend is the ongoing discovery that genomic repetitions are linked to many biological significant events and functions. Diseases (e.g. Huntington's disease) have been causally linked with abnormal expansion of certain repeating sequences in the human genome. Deletions or multiple copy duplications of genes (Copy Number Variations) are important in the aetiology of cancer, Alzheimer, and Parkinson diseases. A second converging trend has been the emergence of many different models and algorithms for detecting non-obvious repeating patterns in strings with applications to in genomic data. Borrowing methodologies from combinatorial pattern, matching, string algorithms, data structures, data mining and machine learning these new approaches break the limitations of the current approaches and offer a new way to design better trans-disciplinary research. The articles collected in this book provides a glance into the rich emerging area of repeatome research, addressing some of its pressing challenges. We believe that these contributions are valuable resources for repeatome research and will stimulate further research from bioinformatic, statistical, and biological points of view.

Analysis and Enumeration Sep 04 2021 In this work we plan to revise the main techniques for enumeration algorithms and to show four examples of enumeration algorithms that can be applied to efficiently deal with some biological problems modelled by using biological networks: enumerating central and peripheral nodes of a network, enumerating stories, enumerating paths or cycles, and enumerating bubbles. Notice that the corresponding computational problems we define are of more general interest and our results hold in the case of arbitrary graphs. Enumerating all the most and less central vertices in a network according to their eccentricity is an example of an enumeration problem whose solutions are polynomial and can be listed in polynomial time, very often in linear or almost linear time in practice. Enumerating stories, i.e. all maximal directed acyclic subgraphs of a graph G whose sources and targets belong to a predefined subset of the vertices, is on the other hand an example of an enumeration problem with an exponential number of solutions, that can be solved by using a non trivial brute-force approach. Given a metabolic network, each individual story should explain how some interesting metabolites are derived from some others through a chain of reactions, by keeping all alternative pathways between sources and targets. Enumerating cycles or paths in an undirected graph, such as a protein-protein interaction undirected network, is an example of an enumeration problem in which all the solutions can be listed through an optimal algorithm, i.e. the time required to list all the solutions is dominated by the time to read the graph plus the time required to print all of them. By extending this

result to directed graphs, it would be possible to deal more efficiently with feedback loops and signed paths analysis in signed or interaction directed graphs, such as gene regulatory networks. Finally, enumerating mouths or bubbles with a source s in a directed graph, that is enumerating all the two vertex-disjoint directed paths between the source s and all the possible targets, is an example of an enumeration problem in which all the solutions can be listed through a linear delay algorithm, meaning that the delay between any two consecutive solutions is linear, by turning the problem into a constrained cycle enumeration problem. Such patterns, in a de Bruijn graph representation of the reads obtained by sequencing, are related to polymorphisms in DNA- or RNA-seq data.

Operating Systems Jan 16 2020 Over the past two decades, there has been a huge amount of innovation in both the principles and practice of operating systems. Over the same period, the core ideas in a modern operating system - protection, concurrency, virtualization, resource allocation, and reliable storage - have become widely applied throughout computer science. Whether you get a job at Facebook, Google, Microsoft, or any other leading-edge technology company, it is impossible to build resilient, secure, and flexible computer systems without the ability to apply operating systems concepts in a variety of settings. This book examines the both the principles and practice of modern operating systems, taking important, high-level concepts all the way down to the level of working code. Because operating systems concepts are among the most difficult in computer science, this top to bottom approach is the only way to really understand and master this important material.

Fusion of Defects Dec 15 2019 Conformal nets provide a mathematical model for conformal field theory. The authors define a notion of defect between conformal nets, formalizing the idea of an interaction between two conformal field theories. They introduce an operation of fusion of defects, and prove that the fusion of two defects is again a defect, provided the fusion occurs over a conformal net of finite index. There is a notion of sector (or bimodule) between two defects, and operations of horizontal and vertical fusion of such sectors. The authors' most difficult technical result is that the horizontal fusion of the vacuum sectors of two defects is isomorphic to the vacuum sector of the fused defect. Equipped with this isomorphism, they construct the basic interchange isomorphism between the horizontal fusion of two vertical fusions and the vertical fusion of two horizontal fusions of sectors.

Princeton Companion to Applied Mathematics Mar 10 2022 The must-have compendium on applied mathematics. This is the most authoritative and accessible single-volume reference book on applied mathematics. Featuring numerous entries by leading experts and organized thematically, it introduces readers to applied mathematics and its uses; explains key concepts; describes important equations, laws, and functions; looks at exciting areas of research; covers modeling and simulation; explores areas of application; and more. Modeled on the popular Princeton Companion to Mathematics, this volume is an indispensable resource for undergraduate and graduate students, researchers, and practitioners in other disciplines seeking a user-friendly reference book on applied mathematics. Features nearly 200 entries organized thematically and written by an international team of distinguished contributors. Presents the major ideas and branches of applied mathematics in a clear and accessible way. Explains important mathematical concepts, methods, equations, and applications. Introduces the language of applied mathematics and the goals of applied mathematical research. Gives a wide range of examples of mathematical modeling. Covers continuum mechanics, dynamical systems, numerical analysis, discrete and combinatorial mathematics, mathematical physics, and much more. Explores the connections between applied mathematics and other disciplines. Includes suggestions for further reading, cross-references, and a comprehensive index.

Statistics for Finance Mar 18 2020 *Statistics for Finance* develops students' professional skills in statistics with applications in finance. Developed from the authors' courses at the Technical University of Denmark and Lund University, the text bridges the gap between classical, rigorous treatments of financial mathematics that rarely connect concepts to data and books on econometrics and time series analysis that do not cover

specific problems related to option valuation. The book discusses applications of financial derivatives pertaining to risk assessment and elimination. The authors cover various statistical and mathematical techniques, including linear and nonlinear time series analysis, stochastic calculus models, stochastic differential equations, Itô's formula, the Black-Scholes model, the generalized method-of-moments, and the Kalman filter. They explain how these tools are used to price financial derivatives, identify interest rate models, value bonds, estimate parameters, and much more. This textbook will help students understand and manage empirical research in financial engineering. It includes examples of how the statistical tools can be used to improve value-at-risk calculations and other issues. In addition, end-of-chapter exercises develop students' financial reasoning skills.

National Reflections on the Netherlands Didactics of Mathematics Dec 19 2022 This open access book, inspired by the ICME 13 Thematic Afternoon on "European Didactic Traditions", consists of 17 chapters, in which educators from the Netherlands reflect on the teaching and learning of mathematics in their country and the role of the Dutch domain-specific instruction theory of Realistic Mathematics Education. Written by mathematics teachers, mathematics teacher educators, school advisors, and developers and researchers in the field of instructional material, textbooks, and examinations, the book offers a multitude of perspectives on important issues in Dutch mathematics education, both at primary and secondary school levels. Topics addressed include the theoretical underpinnings of the Dutch approach, the subject of mathematics in the Dutch educational system, teacher education and testing, the history of mathematics education and the use of history in teaching of mathematics, changes over time in subject matter domains and in the use of technology, and the process of innovation and how the Dutch and in particular one Dutch institute have worked on the reform.

Stochastic Scheduling and Dynamic Programming Jun 13 2022

Grade R in Perspective Feb 09 2022 Grade R in Perspective is a structured academic guide for students, educators and practitioners in the field of early child development. It is compiled according to the Curriculum and Assessment Policy Declaration (CAPS) of the National Department of Education 2011 and presents the latest tendencies of international sources. The focus is put on preparing the student to understand the principles of the informal teaching approach and to implement them. Clear directions are given to develop knowledge, skills and attitudes in the young child so that each learner can achieve self-realisation. Information is given on organising the classroom and the play area to create optimal learning opportunities for the learners. The different levels of development and cultures of the learners are taken into consideration. Valuable suggestions for teaching in practice are illustrated with appropriate examples and photos.

Asymptotic Differential Algebra and Model Theory of Transseries Nov 06 2021 Asymptotic differential algebra seeks to understand the solutions of differential equations and their asymptotics from an algebraic point of view. The differential field of transseries plays a central role in the subject. Besides powers of the variable, these series may contain exponential and logarithmic terms. Over the last thirty years, transseries emerged variously as super-exact asymptotic expansions of return maps of analytic vector fields, in connection with Tarski's problem on the field of reals with exponentiation, and in mathematical physics. Their formal nature also makes them suitable for machine computations in computer algebra systems. This self-contained book validates the intuition that the differential field of transseries is a universal domain for asymptotic differential algebra. It does so by establishing in the realm of transseries a complete elimination theory for systems of algebraic differential equations with asymptotic side conditions. Beginning with background chapters on valuations and differential algebra, the book goes on to develop the basic theory of valued differential fields, including a notion of differential-henselianity. Next, H-fields are singled out among ordered valued differential fields to provide an algebraic setting for the common properties of Hardy fields and the differential field of transseries. The study of their extensions culminates in an analogue of the algebraic closure of a field: the Newton-Liouville closure of an H-field. This paves the way to a quantifier elimination with interesting

consequences.

Metric Spaces of Non-Positive Curvature May 12 2022 A description of the global properties of simply-connected spaces that are non-positively curved in the sense of A. D. Alexandrov, and the structure of groups which act on such spaces by isometries. The theory of these objects is developed in a manner accessible to anyone familiar with the rudiments of topology and group theory: non-trivial theorems are proved by concatenating elementary geometric arguments, and many examples are given. Part I provides an introduction to the geometry of geodesic spaces, while Part II develops the basic theory of spaces with upper curvature bounds. More specialized topics, such as complexes of groups, are covered in Part III.

Linked Lexical Knowledge Bases Apr 30 2021 This book conveys the fundamentals of Linked Lexical Knowledge Bases (LLKB) and sheds light on their different aspects from various perspectives, focusing on their construction and use in natural language processing (NLP). It characterizes a wide range of both expert-based and collaboratively constructed lexical knowledge bases. Only basic familiarity with NLP is required and this book has been written for both students and researchers in NLP and related fields who are interested in knowledge-based approaches to language analysis and their applications. Lexical Knowledge Bases (LKBs) are indispensable in many areas of natural language processing, as they encode human knowledge of language in machine readable form, and as such, they are required as a reference when machines attempt to interpret natural language in accordance with human perception. In recent years, numerous research efforts have led to the insight that to make the best use of available knowledge, the orchestrated exploitation of different LKBs is necessary. This allows us to not only extend the range of covered words and senses, but also gives us the opportunity to obtain a richer knowledge representation when a particular meaning of a word is covered in more than one resource. Examples where such an orchestrated usage of LKBs proved beneficial include word sense disambiguation, semantic role labeling, semantic parsing, and text classification. This book presents different kinds of automatic, manual, and collaborative linkings between LKBs. A special chapter is devoted to the linking algorithms employing text-based, graph-based, and joint modeling methods. Following this, it presents a set of higher-level NLP tasks and algorithms, effectively utilizing the knowledge in LLKBs. Among them, you will find advanced methods, e.g., distant supervision, or continuous vector space models of knowledge bases (KB), that have become widely used at the time of this book's writing. Finally, multilingual applications of LLKB's, such as cross-lingual semantic relatedness and computer-aided translation are discussed, as well as tools and interfaces for exploring LLKBs, followed by conclusions and future research directions.