

Easy Simulations Pioneers A Complete Tool Kit With Background Information Primary Sources And More To Help Students Build Reading And Writing Skills And Deepen Their Understanding Of History

Microscopy is a dynamic area of science, incorporating both basic classroom microscopes and sophisticated research style instruments that can be driven by light, electrons, or X-rays. The rate of advance in the area over the last 50 years has led to a number of technological advances. In this Very Short Introduction Terence Allen, an established expert on microscope techniques, describes the scientific principles behind the main forms of microscopy, and the exciting new developments in the field. Focusing on the main underlying principles, and introducing the power of what is achievable today using microscopes, Allen demonstrates how microscopy impinges on almost every aspect of our daily lives; from medical diagnosis to quality control in manufacture. Beginning with a brief history of the early stages of microscopy development, Allen then concludes with a comprehensive account of the diverse spectrum of microscopy available today. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Most textbooks explain quantum mechanics as a story where each step follows naturally from the one preceding it. However, the development of quantum mechanics was exactly the opposite. It was a zigzag route, full of personal disputes where scientists were forced to abandon well-established classical concepts and to explore new and imaginative pathways. Some of the explored routes were successful in providing new mathematical formalisms capable of predicting experiments at the atomic scale. However, even such successful routes were painful enough, so that relevant scientists like Albert Einstein and Erwin Schrödinger decided not to support them. In this book, the authors demonstrate the huge practical utility of another of these routes in explaining quantum phenomena in many different research fields. Bohmian mechanics, the formulation of the quantum theory pioneered by Louis de Broglie and David Bohm, offers an alternative mathematical formulation of quantum phenomena in terms of quantum trajectories. Novel computational tools to explore physical scenarios that are currently computationally inaccessible, such as many-particle solutions of the Schrödinger equation, can be developed from it.

GIS and Environmental Modeling: Progress and Research Issues Michael F. Goodchild, Louis T. Steyaert, Bradley O. Parks, Carol Johnston, David Maidment, Michael Crane, and Sandi Glendinning, Editors With growing pressure on natural resources and landscapes there is an increasing need to predict the consequences of any changes to the environment. Modelling plays an important role in this by helping our understanding of the environment and by forecasting likely impacts. In recent years moves have been made to link models to Geographical Information Systems to provide a means of analysing changes over an area as well as over time. GIS and Environmental Modeling explores the progress made to date in integrating these two software systems. Approaches to the subject are made from theoretical, technical as well as data stand points. The existing capabilities of current systems are described along with important issues of data availability, accuracy and error. Various case studies illustrate this and highlight the common concepts and issues that exist between researchers in different environmental fields. The future needs and prospects for integrating GIS and environmental models are also explored with developments in both data handling and modelling discussed. The book brings together the knowledge and experience of over 100 researchers from academic, commercial and government backgrounds who work in a wide range of disciplines. The themes followed in the text provide a fund of knowledge and guidance for those involved in environmental modelling and GIS. The book is easily accessible for readers with a basic GIS knowledge and the ideas and results of the research are clearly illustrated with both colour and black and white graphics.

For more than 40 years, Computerworld has been the leading source of technology news and information for IT influencers worldwide. Computerworld's award-winning Web site (Computerworld.com), twice-monthly publication, focused conference series and custom research form the hub of the world's largest global IT media network.

Historians have different views on the core identity of analogue computing. Some portray the technology solely as a precursor to digital computing, whereas others stress that analogue applications existed well after 1940. Even within contemporary sources, there is a spectrum of understanding around what constitutes analogue computing. To understand the relationship between analogue and digital computing, and what this means for users today, the history must consider how the technology is used. Technology for Modelling investigates the technologies, the concepts, and the applications of analogue computing. The text asserts that analogue computing must be thought of as not just a computing technology, but also as a modelling technology, demonstrating how the history of analogue computing can be understood in terms of the parallel themes of calculation and modelling. The book also includes a number of detailed case studies of the technology's use and application. Topics and features: discusses the meaning of analogue computing and its significance in history, and describes the main differences between analogue and digital computing; provides a chronology of analogue computing, based upon the two major strands of calculation and modeling; examines the wider relationship between computing and modelling, and discusses how the theme of modelling fits within the history of analogue computing; describes how the history of analogue computing evolved through a number of stages of use; presents illustrative case studies on analogue modelling in academic research, oil reservoir modelling, aeronautical design, and meteorology. General readers and researchers in the field of history of computing – as well as history of science more generally – will find this book a fascinating insight into the historical use and evolution of technology. The volume provides a long-needed historical framework and context for these core computing technologies. Dr. Charles Care is a senior software engineer at BT and an Associate Fellow at the Department of Computer Science of the University of Warwick, UK.

This book provides a vivid account of the early history of molecular simulation, a new frontier for our understanding of matter that was opened when the demands of theoretical physicists were met by the availability of the modern computers. Since their inception, electronic computers have enormously increased their performance, thus making possible the unprecedented technological revolution that characterizes our present times. This obvious technological advancement has brought with it a silent scientific revolution in the practice of theoretical physics. In particular, in the physics of matter it has opened up a direct route from the microscopic physical laws to observable phenomena. One can now study the time evolution of systems composed of millions of molecules, and simulate the behaviour of macroscopic materials and actually predict their properties. Molecular simulation has provided a new theoretical and conceptual tool that physicists could only dream of when the foundations of statistical mechanics

were laid. Molecular simulation has undergone impressive development, both in the size of the scientific community involved and in the range and scope of its applications. It has become the ubiquitous workhorse for investigating the nature of complex condensed matter systems in physics, chemistry, materials and the life sciences. Yet these developments remain largely unknown outside the inner circles of practitioners, and they have so far never been described for a wider public. The main objective of this book is therefore to offer a reasonably comprehensive reconstruction of the early history of molecular simulation addressed to an audience of both scientists and interested non-scientists, describing the scientific and personal trajectories of the main protagonists and discussing the deep conceptual innovations that their work produced.

Teaching English language arts at grades K-5 is both a science and an art. Educators must teach literacy skills and content with best practices, while also keeping focus on each student's individual needs. They are challenged to monitor students working independently while also conducting small group instruction. And they must focus on providing differentiated support with a rather complicated text. With increased attention to rigor, requirements, and personalized instruction, it can be a challenge to make sure all students are receiving instruction that is just right. Comprehensive Literacy Basics: An Anthology by Capstone Professional contains useful tips to support educators. Chapters focus on each part of the literacy and language arts block, including whole group, small group, writing, and differentiation. A collection of expert authors specializing in literacy and language arts instruction contributed chapters to the book. The quick tips and suggestions within will reinforce current practices while providing an invaluable go-to reference.

This new edition of the classic text extends the scope of critically-oriented work in curriculum studies.

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Popular Mechanics inspires, instructs and influences readers to help them master the modern world. Whether it's practical DIY home-improvement tips, gadgets and digital technology, information on the newest cars or the latest breakthroughs in science -- PM is the ultimate guide to our high-tech lifestyle.

Why are the many highly capable autonomous robots that have been promised for novel applications driven by society, industry, and research not available - day despite the tremendous progress in robotics science and systems achieved during the last decades? Unfortunately, steady improvements in specific robot abilities and robot hardware have not been matched by corresponding robot performance in real world environments. This is mainly due to the lack of advancements in robot software that master the development of robotic systems of ever increasing complexity. In addition, fundamental open problems are still awaiting sound answers while the development of new robotics applications suffers from the lack of widely used tools, libraries, and algorithms that are redesigned in a modular and performant manner with standardized interfaces. Simulation environments are playing a major role not only in reducing development time and cost, e. g. , by systematic software- or hardware-in-the-loop testing of robot performance, but also in exploring new types of robots and applications. However, their use may still be regarded with skepticism. Seamless migration of code using robot simulators to real-world systems is still a rare circumstance, due to the complexity of robot, world, sensor, and actuator modeling. These challenges drive the quest for the next generation of methodologies and tools for robot development. The objective of the International Conference on Simulation, Modeling, and Programming for Autonomous Robots (SIMPAR) is to offer a unique forum for these topics and to bring together researchers from academia and industry to identify and solve the key issues necessary to ease the development of increasingly complex robot software.

Welcome to Bavaria - Germany and to the First Intercontinental Maritime Simulation Symposium and Mathematical Modelling Workshop. A triennial international conference jointly promoted by Control Data, IMSF and SCS, which takes place at Schliersee, a small town near the Alps. The aim of the Symposium is to cover most of the aspects of maritime modelling and simulation in theory and practice, to promote the exchange of knowledge and experience between different international research groups in this field, and to strengthen the international contact between developers and users of modelling and simulation techniques. On the occasion of the Symposium people of scientific and engineering disciplines will meet to discuss the state-of-the art and future activities and developments. A large number of contributed papers has been strictly examined and selected by the papers committee to guarantee a high international standard. The book contains the accepted papers which will be presented at the Symposium. The papers have been classified according to the following topics: VI 1. Fifth Generation Computer Technology 2. Simulation-Software-Tools 3. An Industrial Computer System - The Chrysler Story 4. Marine Mathematical Modelling 5. CFD for Marine Vehicles 6. Navigation Methodology 7. Marine Maneuvering and Motion Simulation 8. Off-Shore Modelling 9. Steering and Control of Marine Vehicles 10. Training and Traffic Control 11. Under-Water Vehicles Operation Authors from 9 countries will meet at the Symposium.

Multilevel Modeling: Applications in STATA®, IBM® SPSS®, SAS®, R & HLMTM provides a gentle, hands-on illustration of the most common types of multilevel modeling software, offering instructors multiple software resources for their students and an applications-based foundation for teaching multilevel modeling in the social sciences. Author G. David Garson's step-by-step instructions for software walk readers through each package. The instructions for the different platforms allow students to get a running start using the package with which they are most familiar while the instructor can start teaching the concepts of multilevel modeling right away. Instructors will find this text serves as both a comprehensive resource for their students and a foundation for their teaching alike.

The allure of educational technology is easy to understand. Classroom instruction is an expensive and time-consuming process fraught with contradictory theories and frustratingly uneven results. Educators, inspired by machines' contributions to modern life, have been using technology to facilitate teaching for centuries. In Teaching Machines, Bill Ferster examines past attempts to automate instruction from the earliest use of the postal service for distance education

to the current maelstrom surrounding Massive Open Online Courses. He tells the stories of the entrepreneurs and visionaries who, beginning in the colonial era, developed and promoted various instructional technologies. Ferster touches on a wide range of attempts to enhance the classroom experience with machines, from hornbooks, the Chautauqua movement, and correspondence courses to B. F. Skinner's teaching machine, intelligent tutoring systems, and eLearning. The famed progressive teachers, researchers, and administrators that the book highlights often overcame substantial hurdles to implement their ideas, but not all of them succeeded in improving the quality of education.

Teaching Machines provides invaluable new insight into our current debate over the efficacy of educational technology. This book is a fully updated and revised second edition of a highly successful text in which a new concept of knowledge mining, based on explication and transfer of interventional knowledge of experts, has been implemented. The dedicated training program that is set out will serve the needs of all interventional operators, whether cardiologists, vascular surgeons, vascular specialists, or radiologists, enabling them to achieve a consistent expert level across the entire broad spectrum of catheter-based interventions. Operator skills – and in particular decision-making and strategic skills – are the most critical factors for the outcome of catheter-based cardiovascular interventions. Currently, such skills are commonly developed by the empirical trial and error method only. The explicit teaching, training, and learning approach adopted in this book permits the rapid transfer of interventional knowledge and enables individual operators to negotiate steep learning curves and acquire complex skills in a highly efficient manner. It will thereby offer invaluable assistance in meeting successfully the challenges of modern cardiovascular care.

This first book to cover different injection techniques not only provides a comprehensive overview of methodologies and instrumentation, it also covers recent advances in flow method analysis, with an appendix listing additional databases, instrumentation and methods on the Internet. A definite must-have for every chemist working in this field.

It's an astonishing fact that capturing all the energy in just one hour's worth of sunlight would enable us to meet the planet's food and energy needs for an entire year. The Solar Revolution tells the story of how scientists are working to reconnect us to the 'solar economy', harnessing the power of the sun to provide sustainable food and energy for a global population of 10 billion people: an achievement that would end our dependence on 'fossilised sunshine' in the form of coal, oil and gas and remake our connection with the soil that grows our food. Steve McKeivitt and Tony Ryan describe the human race's complex relationship with the sun and take us back through history to see how our world became the place it is today – chemically, geologically, ecologically, climatically and economically – before moving on to the cutting-edge science and technology that will enable us to live happily in a sustainable future.

This monograph presents urban simulation methods that help in better understanding urban dynamics. Over historical times, cities have progressively absorbed a larger part of human population and will concentrate three quarters of humankind before the end of the century. This "urban transition" that has totally transformed the way we inhabit the planet is globally understood in its socio-economic rationales but is less frequently questioned as a spatio-temporal process. However, the cities, because they are intrinsically linked in a game of competition for resources and development, self organize in "systems of cities" where their future becomes more and more interdependent. The high frequency and intensity of interactions between cities explain that urban systems all over the world exhibit large similarities in their hierarchical and functional structure and rather regular dynamics. They are complex systems whose emergence, structure and further evolution are widely governed by the multiple kinds of interaction that link the various actors and institutions investing in cities their efforts, capital, knowledge and intelligence. Simulation models that reconstruct this dynamics may help in better understanding it and exploring future plausible evolutions of urban systems. This would provide better insight about how societies can manage the ecological transition at local, regional and global scales. The author has developed a series of instruments that greatly improve the techniques of validation for such models of social sciences that can be submitted to many applications in a variety of geographical situations. Examples are given for several BRICS countries, Europe and United States. The target audience primarily comprises research experts in the field of urban dynamics, but the book may also be beneficial for graduate students.

The book highlights recent developments in the field of biomedical systems covering a wide range of technological aspects, methods, systems and instrumentation techniques for diagnosis, monitoring, treatment, and assistance. Biomedical systems are becoming increasingly important in medicine and in special areas of application such as supporting people with disabilities and under pandemic conditions. They provide a solid basis for supporting people and improving their health care. As such, the book offers a key reference guide about novel medical systems for students, engineers, designers, and technicians.

We are delighted to present the proceedings of the 12th Asia-Pacific Network Operations and Management Symposium (APNOMS 2009), which was held in Jeju, Korea, during September 23–25, 2009. Recently, various convergences in wired and wireless networks, and convergence of telecommunications and broadcastings, are taking place for ubiquitous multimedia service provisioning. For example, broadband IP/MPLS wired networks are actively converged with IEEE 802.11e wireless LAN, IEEE 802.16 Wireless MAN, 3G/4G wireless cellular networks, and direct multimedia broadcast (DMB) networks. For efficient support of service provisioning for ubiquitous multimedia services on the broadband convergence networks, well-designed and implemented network operations and management functions with QoS guaranteed traffic engineering are essential. The converged network will open the way for a new world with emerging new businesses and computing services. The Organizing Committee (OC) selected "Management Enabling the Future Internet for Changing Business and New Computing Services" as the timely theme of APNOMS 2009. Contributions from academia, industry and research institutions met these challenges with 173 paper submissions, from which 41 high-quality papers (23.7% of the submissions) were selected for technical sessions as full papers, and 32 papers were selected as short papers. In addition, we had nine papers in innovation sessions for on-going research. Diverse topics were covered, including Traffic Trace Engineering, Configuration and Fault Management, Management of IP-Based Networks, Autonomous and Distributed Control, Sensor Network and P2P Management, Converged Networks and Traffic Engineering, SLA and QoS Management, Active and Security Management, Wireless and Mobile Network

Management, and Security Management.

This four-volume collection of over 140 original chapters covers virtually everything of interest to demographers, sociologists, and others. Over 100 authors present population subjects in ways that provoke thinking and lead to the creation of new perspectives, not just facts and equations to be memorized. The articles follow a theory-methods-applications approach and so offer a kind of "one-stop shop" that is well suited for students and professors who need non-technical summaries, such as political scientists, public affairs specialists, and others. Unlike shorter handbooks, *Demography: Analysis and Synthesis* offers a long overdue, thorough treatment of the field. Topics to be covered: * Population Dynamics and the Relationship Between Population Growth and Structure * The Determinants of Fertility * The Determinants of Mortality * The Determinants of Migration * Historical and Geographical Determinants of Population * The Effects of Population on Health, Economics, Culture, and the Environment * Population Policies * Data Collection Methods and Teaching about Population Studies * All chapters share a common format * Each chapter features several cross-references to other chapters * Tables, charts, and other non-text features are widespread * Each chapter contains at least 30 bibliographic citations

Designed for learning professionals and drawing on both game creators and instructional designers, *Learning by Doing* explains how to select, research, build, sell, deploy, and measure the right type of educational simulation for the right situation. It covers simple approaches that use basic or no technology through projects on the scale of computer games and flight simulators. The book role models content as well, written accessibly with humor, precision, interactivity, and lots of pictures. Many will also find it a useful tool to improve communication between themselves and their customers, employees, sponsors, and colleagues. As John Coné, former chief learning officer of Dell Computers, suggests, "Anyone who wants to lead or even succeed in our profession would do well to read this book."

Risk Measures and Insurance Solvency Benchmarks: Fixed-Probability Levels in Renewal Risk Models is written for academics and practitioners who are concerned about potential weaknesses of the Solvency II regulatory system. It is also intended for readers who are interested in pure and applied probability, have a taste for classical and asymptotic analysis, and are motivated to delve into rather intensive calculations. The formal prerequisite for this book is a good background in analysis. The desired prerequisite is some degree of probability training, but someone with knowledge of the classical real-variable theory, including asymptotic methods, will also find this book interesting. For those who find the proofs too complicated, it may be reassuring that most results in this book are formulated in rather elementary terms. This book can also be used as reading material for basic courses in risk measures, insurance mathematics, and applied probability. The material of this book was partly used by the author for his courses in several universities in Moscow, Copenhagen University, and in the University of Montreal. Features Requires only minimal mathematical prerequisites in analysis and probability Suitable for researchers and postgraduate students in related fields Could be used as a supplement to courses in risk measures, insurance mathematics and applied probability.

Computational methods are an integral part of most scientific disciplines, and a rudimentary understanding of their potential and limitations is essential for any scientist or engineer. This textbook introduces computational science through a set of methods and algorithms, with the aim of familiarizing the reader with the field's theoretical foundations and providing the practical skills to use and develop computational methods. Centered around a set of fundamental algorithms presented in the form of pseudocode, this self-contained textbook extends the classical syllabus with new material, including high performance computing, adjoint methods, machine learning, randomized algorithms, and quantum computing. It presents theoretical material alongside several examples and exercises and provides Python implementations of many key algorithms. *Methods in Computational Science* is for advanced undergraduate and graduate-level students studying computer science and data science. It can also be used to support continuous learning for practicing mathematicians, data scientists, computer scientists, and engineers in the field of computational science. It is appropriate for courses in advanced numerical analysis, data science, numerical optimization, and approximation theory.

This new edition details the important features of beam shaping and exposes the subtleties of the theory and techniques that are best demonstrated through proven applications. New chapters cover illumination light shaping in optical lithography; optical micro-manipulation of live mammalian cells through trapping, sorting, and transfection; and laser beam shaping through fiber optic beam delivery. The book discusses applications in lithography, laser printing, optical data storage, stable isotope separation, and spatially dispersive lasers. It also provides a history of the field and includes extensive references.

The 6th International Symposium on Distributed Autonomous Robotic Systems (DARS 2002) was held in June 2002 in Fukuoka, Japan, a decade after the first DARS symposium was convened. This book, containing the proceedings of the symposium, provides broad coverage of the technical issues in the current state of the art in distributed autonomous systems composed of multiple robots, robotic modules, or robotic agents. DARS 2002 dealt with new strategies for realizing complex, modular, robust, and fault-tolerant robotic systems, and this volume covers the technical areas of system design, modeling, simulation, operation, sensing, planning, and control. The papers that are included here were contributed by leading researchers from Asia, Oceania, Europe, and the Americas, and make up an invaluable resource for researchers and students in the field of distributed autonomous robotic systems.

Against the background of the financial-cum-sovereign debt crisis, government debt managers are currently faced by a challenging environment. One key element in that respect is the analysis and forecast of interest rates, which is important for achieving the strategic objective of low borrowing costs. Anja Hubig develops a new mathematical method to estimate the term structure of interest rates, that is adopted to describe the term structure dynamics within a stochastic setting. The introduced model is capable to capture the complex behavior of the entire yield curve with a reduced set of parameters. It essentially ensures a comprehensive analysis of the costs and risks associated with individual funding strategies, and thus effectively supports the selection of a long-term optimal debt portfolio composition.

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