Get to grips with the basics of Keras to implement fast and efficient deep-learning models About This Book Implement various deep-learning algorithms in Keras and see how deep-learning can be used in games See how various deep-learning models and practical use-cases can be implemented using Keras A practical, hands-on guide with real-world examples to give you a strong foundation in Keras Who This Book Is For If you are a data scientist with experience in machine learning or an AI programmer with some exposure to neural networks, you will find this book a useful entry point to deep-learning with Keras. A knowledge of Python is required for this book. What You Will Learn Optimize step-by-step functions on a large neural network using the Backpropagation Algorithm Fine-tune a neural network to improve the quality of results Use deep learning for image and audio processing Use Recursive Neural Tensor Networks (RNTNs) to outperform standard word embedding in special cases Identify problems for which Recurrent Neural Network (RNN) solutions are suitable Explore the process required to implement Autoencoders Evolve a deep neural network using reinforcement learning In Detail This book starts by introducing you to supervised learning algorithms such as simple linear regression, the classical multilayer perceptron and more sophisticated deep convolutional networks. You will also explore image processing with recognition of handwritten digit images, classification of images into different categories, and advanced object recognition with related image annotations. An example of identification of salient points for face detection is also provided. Next you will be introduced to Recurrent Networks, which are optimized for processing sequence data such as text, audio or time series. Following that, you will learn about unsupervised learning algorithms such as Autoencoders and the very popular Generative Adversarial Networks (GAN). You will also explore non-traditional uses of neural networks as Style Transfer. Finally, you will look at Reinforcement Learning and its application to AI game playing, another popular direction of research and application of neural networks. Style and approach This book is an easy-to-follow guide full of examples and real-world applications to help you gain an in-depth understanding of Keras. This book will showcase more than twenty working Deep Neural Networks coded in Python using Keras.

Soft Computing Applications

This book gathers selected papers presented at the 2020 World Conference on Information Systems and Technologies (WorldCIST'20), held in Budva, Montenegro, from April 7 to 10, 2020. WorldCIST provides a global forum for researchers and practitioners to present and discuss recent results and innovations, current trends, professional experiences with and challenges regarding various aspects of modern information systems and technologies. The main topics covered are A) Information and Knowledge Management; B) Organizational Models and Information Systems; C) Software and Systems Modeling; D) Software Systems, Architectures, Applications and Tools; E) Multimedia Systems and Applications; F) Computer Networks, Mobility and Pervasive Systems; G)
Mathematical Modeling of Pharmacokinetic Data

This book presents the proceedings of the 8th International Workshop on Soft Computing Applications, SOFA 2018, held on 13–15 September 2018 in Arad, Romania. The workshop was organized by Aurel Vlaicu University of Arad, in conjunction with the Institute of Computer Science, Iasi Branch of the Romanian Academy, IEEE Romanian Section, Romanian Society of Control Engineering and Technical Informatics in Arad Section, General Association of Engineers in Romania in Arad Section and BTM Resources Arad. The papers included in these proceedings, published post-conference, cover the research including Knowledge-Based Technologies for Web Applications, Cloud Computing, Security Algorithms and Computer Networks, Business Process Management, Computational Intelligence in Education and Modelling and Applications in Textiles and many other areas related to the Soft Computing. The book is directed to professors, researchers, and graduate students in areas of soft computing techniques and applications.

The Data Analysis BriefBook

This BriefBook is a much extended glossary or a much condensed handbook, depending on the way one looks at it. In encyclopedic format, it covers subjects in statistics, computing, analysis, and related fields, resulting in a book that is both an introduction and a reference for scientists and engineers, especially experimental physicists dealing with data analysis.

Digital Video for Teacher Education

This fast-paced introduction to Python moves from the basics to advanced concepts, enabling readers to gain proficiency quickly.

EUA Bologna Handbook

May the Forcing Functions be with You: The Stimulating World of AIED and ITS Research It is my pleasure to write the foreword for Advances in Intelligent Tutoring Systems. This collection, with contributions from leading researchers in the field of artificial intelligence in education (AIED), constitutes an overview of the many challenging research problems that must be solved in order to build a truly intelligent tutoring system (ITS). The book not only describes some of the approaches and techniques that have been explored to meet these challenges, but also some of the systems that have actually been built and deployed in this effort. As discussed in the Introduction (Chapter 1), the terms AIED and ITS are often used interchangeably, and there is a large overlap in the researchers devoted to exploring this common field. In this foreword, I will use the term AIED to refer to the research area, and the term ITS to refer to the particular kind of system that AIED researchers build. It has often been said that AIED is AI-complete in that to produce a tutoring system as sophisticated and effective as a human tutor requires solving the entire gamut of artificial intelligence research (AI) problems.

Numerical Methods for the Solution of Ill-Posed Problems

This book presents peer-reviewed contributions on smart universities by various international research, design and development teams. Smart university is an emerging and rapidly evolving area that creatively integrates innovative concepts; smart software and hardware systems; smart classrooms with state-of-the-art technologies and technical platforms; smart pedagogy based on modern teaching and learning strategies; smart learning and academic analytics; as well as various branches of computer science and computer engineering. The contributions are grouped into several parts: Part 1—Smart Universities: Literature Review and Creative Analysis, Part 2—Smart Universities: Concepts, Systems and Technologies, Part 3—Smart Education: Approaches and Best Practices, and Part 4—Smart Universities: Smart Long Life Learning. The book is a valuable source of research data and findings, design and development outcomes, and best practices for faculty, scholars, Ph.D students, administrators, practitioners and anyone interested in the rapidly growing areas of smart university and smart education.
A First Course in Computational Physics and Object-Oriented Programming with C++
Hardback with CD-ROM

A standalone text for courses on computational physics combining idiomatic Python, foundational numerical
methods, and physics applications.

Advances in Intelligent Tutoring Systems

Computational physics is a rapidly growing subfield of computational science, in large part because computers can
solve previously intractable problems or simulate natural processes that do not have analytic solutions. The next step
beyond Landau's First Course in Scientific Computing and a follow-up to Landau and Páez's Computational Physics,
this text presents a broad survey of key topics in computational physics for advanced undergraduates and beginning
graduate students, including new discussions of visualization tools, wavelet analysis, molecular dynamics, and
computational fluid dynamics. By treating science, applied mathematics, and computer science together, the book
reveals how this knowledge base can be applied to a wider range of real-world problems than computational physics
texts normally address. Designed for a one- or two-semester course, A Survey of Computational Physics will also
interest anyone who wants a reference on or practical experience in the basics of computational physics. Accessible
to advanced undergraduates Real-world problem-solving approach Java codes and applets integrated with text
Companion Web site includes videos of lectures

A Survey of Computational Physics

Digital video use is becoming prevalent in teacher education as a tool to help improve teaching and learning and for
assessing effective teaching. Timely and comprehensive, this volume brings together top scholars from multiple
disciplines to provide sound theoretical frameworks, research-based support, and clear practical advice on a variety
of unique approaches to using digital video in teacher education programs. Part I deals with the use of video for
teacher learning. Part II focuses on the role played by those other than teachers in the effective use of digital video in
teacher education programs. Part III addresses how to administer video for teacher education. Exploring the
complexities of effectively and appropriately integrating digital video into teacher development at various stages,
this book is a must-have resource for scholars and professionals in the field.

Smart Education and Smart e-Learning

This book constitutes the proceedings of the 11th International Conference on Informatics in Schools: Situation,
Evolution and Perspectives, ISSEP 2018, held in St. Petersburg, Russia, in October 2018. The 29 full papers
presented in this volume were carefully reviewed and selected from 74 submissions. They were organized in topical
sections named: role of programming and algorithmics in informatics for pupils of all ages; national concepts of
teaching informatics; teacher education in informatics; contests and competitions in informatics; socio-psychological
aspects of teaching informatics; and computer tools in teaching and studying informatics.

The Algebraic Theory of Switching Circuits

These are the proceedings of the International Conference on ISMAC-CVB, held in Palladam, India, in May 2018.
The book focuses on research to design new analysis paradigms and computational solutions for quantification of
information provided by object recognition, scene understanding of computer vision and different algorithms like
convolutional neural networks to allow computers to recognize and detect objects in images with unprecedented
accuracy and to even understand the relationships between them. The proceedings treat the convergence of ISMAC
in Computational Vision and Bioengineering technology and includes ideas and techniques like 3D sensing, human
visual perception, scene understanding, human motion detection and analysis, visualization and graphical data
presentation and a very wide range of sensor modalities in terms of surveillance, wearable applications, home
automation etc. ISMAC-CVB is a forum for leading academic scientists, researchers and research scholars to
exchange and share their experiences and research results about all aspects of computational vision and
bioengineering.

Effective Computation in Physics
The Algebraic Theory of Switching Circuits covers the application of various algebraic tools to the delineation of the algebraic theory of switching circuits for automation with contacts and relays. This book is organized into five parts encompassing 31 chapters. Part I deals with the principles and application of Boolean algebra and the theory of finite fields (Galois fields). Part II emphasizes the importance of the sequential operation of the automata and the variables associated to the current and to the contacts. This part also tackles the recurrence relations that describe operations of the network and the principles of the so-called characteristic equations. Part III reviews the study of networks with secondary elements other than ordinary relays, while Part IV focuses on the fundamentals and application of multi-position contacts. Part V considers several topics related to circuit with electronic elements, including triodes, pentodes, transistors, and cryotrons. This book will be of great value to practicing engineers, mathematicians, and workers in the field of computers.

Microwave Remote Sensing of Land Surfaces

Prentice Hall Series In Engineering Of The Physical Sciences.

Intelligent Robotic Systems

The use of computation and simulation has become an essential part of the scientific process. Being able to transform a theory into an algorithm requires significant theoretical insight, detailed physical and mathematical understanding, and a working level of competency in programming. This upper-division text provides an unusually broad survey of the topics of modern computational physics from a multidisciplinary, computational science point of view. Its philosophy is rooted in learning by doing (assisted by many model programs), with new scientific materials as well as with the Python programming language. Python has become very popular, particularly for physics education and large scientific projects. It is probably the easiest programming language to learn for beginners, yet is also used for mainstream scientific computing, and has packages for excellent graphics and even symbolic manipulations. The text is designed for an upper-level undergraduate or beginning graduate course and provides the reader with the essential knowledge to understand computational tools and mathematical methods well enough to be successful. As part of the teaching of using computers to solve scientific problems, the reader is encouraged to work through a sample problem stated at the beginning of each chapter or unit, which involves studying the text, writing, debugging and running programs, visualizing the results, and the expressing in words what has been done and what can be concluded. Then there are exercises and problems at the end of each chapter for the reader to work on their own (with model programs given for that purpose). The text could be used for a one-semester course on scientific computing. The relevant topics for that are covered in the first third of the book. The latter two-thirds of the text includes more physics and can be used for a two-semester course in computational physics, covering nonlinear ODEs, Chaotic Scattering, Fourier Analysis, Wavelet Analysis, Nonlinear Maps, Chaotic systems, Fractals and Parallel Computing. The e-book extends the paper version by including many codes, visualizations and applets, as well as links to video lectures. * A table at the beginning of each chapter indicates video lectures, slides, applets and animations. * Applets illustrate the results to be expected for projects in the book, and to help understand some abstract concepts (e.g. Chaotic Scattering) * The eBook's figures, equations, sections, chapters, index, table of contents, code listings, glossary, animations and executable codes (both Applets and Python programs) are linked, much like in a Web document. * Some equations are linked to their xml forms (which can be imported into Maple or Mathematica for manipulation). * The e-book will link to video-based lecture modules, held by principal author Professor Rubin Landau, that cover most every topic in the book.

Digital Marketplaces Unleashed

This second edition increases the universality of the previous edition by providing all its codes in the Java language, whose compiler and development kit are available for free for essentially all operating systems. In addition, the accompanying CD provides many of the same codes in Fortran 95, Fortran 77, and C, for even more universal application, as well as MPI codes for parallel applications. The book also includes new materials on trial-and-error search techniques, IEEE floating point arithmetic, probability and statistics, optimization and tuning in multiple languages, parallel computing with MPI, JAMA the Java matrix library, the solution of simultaneous nonlinear equations, cubic splines, ODE eigenvalue problems, and Java plotting programs. From the reviews of the first edition: "Landau and Paez's book would be an excellent choice for a course on computational physics which emphasizes computational methods and programming.” - American Journal of Physics

Computational Problems for Physics
Learning Scientific Programming with Python

This textbook presents a concise, accessible and engaging first introduction to deep learning, offering a wide range of connectionist models which represent the current state-of-the-art. The text explores the most popular algorithms and architectures in a simple and intuitive style, explaining the mathematical derivations in a step-by-step manner. The content coverage includes convolutional networks, LSTMs, Word2vec, RBMs, DBNs, neural Turing machines, memory networks and autoencoders. Numerous examples in working Python code are provided throughout the book, and the code is also supplied separately at an accompanying website. Topics and features: introduces the fundamentals of machine learning, and the mathematical and computational prerequisites for deep learning; discusses feed-forward neural networks, and explores the modifications to these which can be applied to any neural network; examines convolutional neural networks, and the recurrent connections to a feed-forward neural network; describes the notion of distributed representations, the concept of the autoencoder, and the ideas behind language processing with deep learning; presents a brief history of artificial intelligence and neural networks, and reviews interesting open research problems in deep learning and connectionism. This clearly written and lively primer on deep learning is essential reading for graduate and advanced undergraduate students of computer science, cognitive science and mathematics, as well as fields such as linguistics, logic, philosophy, and psychology.

E-Learning, E-Education, and Online Training

This book is a comprehensive guide to machine learning with worked examples in MATLAB. It starts with an overview of the history of Artificial Intelligence and automatic control and how the field of machine learning grew from these. It provides descriptions of all major areas in machine learning. The book reviews commercially available packages for machine learning and shows how they fit into the field. The book then shows how MATLAB can be used to solve machine learning problems and how MATLAB graphics can enhance the programmer's understanding of the results and help users of their software grasp the results. Machine Learning can be very mathematical. The mathematics for each area is introduced in a clear and concise form so that even casual readers can understand the math. Readers from all areas of engineering will see connections to what they know and will learn new technology. The book then provides complete solutions in MATLAB for several important problems in machine learning including face identification, autonomous driving, and data classification. Full source code is provided for all of the examples and applications in the book. What you'll learn: An overview of the field of machine learning Commercial and open source packages in MATLAB How to use MATLAB for programming and building machine learning applications MATLAB graphics for machine learning Practical real world examples in MATLAB for major applications of machine learning in big data Who is this book for: The primary audiences are engineers and engineering students wanting a comprehensive and practical introduction to machine learning.

Trends and Innovations in Information Systems and Technologies

A multiplicity of techniques and angles of attack are incorporated in 18 contributions describing recent developments in the structure, architecture, programming, control, and implementation of industrial robots capable of performing intelligent action and decision making. Annotation copyright Book

Deep Learning with Keras

This is the first comprehensive research monograph devoted to the use of augmented reality in education. It is written by a team of 58 world-leading researchers, practitioners and artists from 15 countries, pioneering in employing augmented reality as a new teaching and learning technology and tool. The authors explore the state of the art in educational augmented reality and its usage in a large variety of particular areas, such as medical education
and training, English language education, chemistry learning, environmental and special education, dental training, mining engineering teaching, historical and fine art education. Augmented Reality in Education: A New Technology for Teaching and Learning is essential reading not only for educators of all types and levels, educational researchers and technology developers, but also for students (both graduates and undergraduates) and anyone who is interested in the educational use of emerging augmented reality technology.

Computational Physics

Using a simple computational task (term frequency) to illustrate different programming styles, Exercises in Programming Style helps readers understand the various ways of writing programs and designing systems. It is designed to be used in conjunction with code provided on an online repository. The book complements and explains the raw code in a way that is accessible to anyone who regularly practices the art of programming. The book can also be used in advanced programming courses in computer science and software engineering programs. The book contains 33 different styles for writing the term frequency task. The styles are grouped into nine categories: historical, basic, function composition, objects and object interactions, reflection and metaprogramming, adversity, data-centric, concurrency, and interactivity. The author verbalizes the constraints in each style and explains the example programs. Each chapter first presents the constraints of the style, next shows an example program, and then gives a detailed explanation of the code. Most chapters also have sections focusing on the use of the style in systems design as well as sections describing the historical context in which the programming style emerged.

Exercises in Programming Style

Handbook of Research on Blockchain Technology presents the latest information on the adaptation and implementation of Blockchain technologies in real world business, scientific, healthcare and biomedical applications. The book’s editors present the rapid advancements in existing business models by applying Blockchain techniques. Novel architectural solutions in the deployment of Blockchain comprise the core aspects of this book. Several use cases with IoT, biomedical engineering, and smart cities are also incorporated. As Blockchain is a relatively new technology that exploits decentralized networks and is used in many sectors for reliable, cost-effective and rapid business transactions, this book is a welcomed addition on existing knowledge. Financial services, retail, insurance, logistics, supply chain, public sectors and biomedical industries are now investing in Blockchain research and technologies for their business growth. Blockchain prevents double spending in financial transactions without the need of a trusted authority or central server. It is a decentralized ledger platform that facilitates verifiable transactions between parties in a secure and smart way. Presents the evolution of blockchain, from fundamental theories, to present forms Explains the concepts of blockchain related to cloud/edge computing, smart healthcare, smart cities and Internet of Things (IoT) Provides complete coverage of the various tools, platforms and techniques used in blockchain Explodes smart contract tools and consensus algorithms Covers a variety of applications with real world case studies in areas such as biomedical engineering, supply chain management, and tracking of goods and delivery

Essentials of Blockchain Technology

A concise guide to mathematical modeling and analysis of pharmacokinetic data, this book contains valuable methods for maximizing the information obtained from given data. It is an ideal resource for scientists, scholars, and advanced students.


This book constitutes the proceedings of the 3rd International Conference on E-Learning, E-Education, and Online Training, eLEOT 2016, held in Dublin, Ireland, August 31 – September 2, 2016. The 25 revised full papers presented were carefully reviewed and selected from 35 submissions. They focus on topics as augmented reality learning, blended learning, learning analytics, mobile learning, virtual learning environments.

Informatics in Schools. Fundamentals of Computer Science and Software Engineering

Textbook and reference work on the application of C++ in science and engineering.
Partial Differential Equation Methods for Image Inpainting

In this textbook a combination of standard mathematics and modern numerical methods is used to describe a wide range of natural wave phenomena, such as sound, light and water waves, particularly in specific popular contexts, e.g. colors or the acoustics of musical instruments. It introduces the reader to the basic physical principles that allow the description of the oscillatory motion of matter and classical fields, as well as resulting concepts including interference, diffraction, and coherence. Numerical methods offer new scientific insights and make it possible to handle interesting cases that can't readily be addressed using analytical mathematics; this holds true not only for problem solving but also for the description of phenomena. Essential physical parameters are brought more into focus, rather than concentrating on the details of which mathematical trick should be used to obtain a certain solution. Readers will learn how time-resolved frequency analysis offers a deeper understanding of the interplay between frequency and time, which is relevant to many phenomena involving oscillations and waves. Attention is also drawn to common misconceptions resulting from uncritical use of the Fourier transform. The book offers an ideal guide for upper-level undergraduate physics students and will also benefit physics instructors. Program codes in Matlab and Python, together with interesting files for use in the problems, are provided as free supplementary material.

Augmented Reality in Education

This book constitutes the proceedings of the 4rd International Conference on e-Learning, e-Education, and Online Training, eLEOT 2018, held in Shanghai, China, in April 2018. The 49 revised full papers presented were carefully reviewed and selected from 120 submissions. They focus on most recent and innovative trends in this broad area, ranging from distance education to collaborative learning, from interactive learning environments to the modelling of STEM (Science, Technology, Mathematics, Engineering) curricula.

Mechanics of Solids and Fluids

Users of statistics in their professional lives and statistics students will welcome this concise, easy-to-use reference for basic statistics and probability. It contains all of the standardized statistical tables and formulas typically needed plus material on basic statistics topics, such as probability theory and distributions, regression, analysis of variance, nonparametric statistics, and statistical quality control. For each type of distribution the authors supply: definitions, tables, relationships with other distributions, including limiting forms, statistical parameters, such as variance and generating functions, a list of common problems involving the distribution. Standard Probability and Statistics: Tables and Formulae also includes discussion of common statistical problems and supplies examples that show readers how to use the tables and formulae to get the solutions they need. With this handy reference, the focus can shift from rote learning and memorization to the concepts needed to use statistics efficiently and effectively.

e-Learning, e-Education, and Online Training

Blockchain technologies, as an emerging distributed architecture and computing paradigm, have accelerated the development/application of the Cloud/GPU/Edge Computing, Artificial Intelligence, cyber physical systems, social networking, crowdsourcing and crowdsensing, 5G, trust management, and finance. The popularity and rapid development of Blockchain brings many technical and regulatory challenges for research and academic communities. This book will feature contributions from experts on topics related to performance, benchmarking, durability, robustness, as well data gathering and management, algorithms, analytics techniques for transactions processing, and implementation of applications.

Smart Education and e-Learning 2016

More physicists today are taking on the role of software developer as part of their research, but software development isn't always easy or obvious, even for physicists. This practical book teaches essential software development skills to help you automate and accomplish nearly any aspect of research in a physics-based field. Written by two PhDs in nuclear engineering, this book includes practical examples drawn from a working knowledge of physics concepts. You'll learn how to use the Python programming language to perform everything from collecting and analyzing data to building software and publishing your results. In four parts, this book includes: Getting Started: Jump into Python, the command line, data containers, functions, flow control and logic, and classes.
and objects Getting It Done: Learn about regular expressions, analysis and visualization, NumPy, storing data in files and HDF5, important data structures in physics, computing in parallel, and deploying software. Getting It Right: Build pipelines and software, learn to use local and remote version control, and debug and test your code. Getting It Out There: Document your code, process and publish your findings, and collaborate efficiently; dive into software licenses, ownership, and copyright procedures.

Physics of Oscillations and Waves

Many problems in science, technology, and engineering are posed in the form of operator equations of the first kind, with the operator and RHS approximately known. But such problems often turn out to be ill-posed, having no solution, or a non-unique solution, and/or an unstable solution. Non-existence and non-uniqueness can usually be overcome by settling for ‘generalised’ solutions, leading to the need to develop regularising algorithms. The theory of ill-posed problems has advanced greatly since A. N. Tikhonov laid its foundations, the Russian original of this book (1990) rapidly becoming a classical monograph on the topic. The present edition has been completely updated to consider linear ill-posed problems with or without a priori constraints (non-negativity, monotonicity, convexity, etc.). Besides the theoretical material, the book also contains a FORTRAN program library. Audience: Postgraduate students of physics, mathematics, chemistry, economics, engineering. Engineers and scientists interested in data processing and the theory of ill-posed problems.

A First Course in Scientific Computing

MATLAB Machine Learning

Visions and Concepts for Education 4.0

This collection of different views on how digitalization is influencing various industrial sectors addresses essential topics like big data and analytics, fintech and insuretech, cloud and mobility technologies, disruption and entrepreneurship. The technological advances of the 21st century have been massively impacted by the digital upheaval: there is no future without digitalization. The sale of products and services has left the classical point of sale and now takes place on a variety of channels. Whether in the automotive industry, travel and traffic, in cities, or the financial industry – newly designed ecosystems are being created everywhere; data is being generated and analyzed in real time; and companies are competing for mobile access channels to customers in order to gain knowledge about their individual contexts and preferences. In turn, customers can now publicly share their opinions, experiences and knowledge as User Generated Content, allowing them to impact the market and empowering them to build or destroy trust.

Introduction to Deep Learning

This book contains papers in the fields of Interactive, Collaborative, and Blended Learning; Technology-Supported Learning; Education 4.0; Pedagogical and Psychological Issues. With growing calls for affordable and quality education worldwide, we are currently witnessing a significant transformation in the development of post-secondary education and pedagogical practices. Higher education is undergoing innovative transformations to respond to our urgent needs. The change is hastened by the global pandemic that is currently underway. The 9th International Conference on Interactive, Collaborative, and Blended Learning: Visions and Concepts for Education 4.0 was conducted in an online format at McMaster University, Canada, from 14th to 15th October 2020, to deliberate and share the innovations and strategies. This conferences main objectives were to discuss guidelines and new concepts for engineering education in higher education institutions, including emerging technologies in learning; to debate new conference format in worldwide pandemic and post-pandemic conditions; and to discuss new technology-based tools and resources that drive the education in non-traditional ways such as Education 4.0. Since its beginning in 2007, this conference is devoted to new learning approaches with a focus on applications and experiences in the fields of interactive, collaborative, and blended learning and related new technologies. Currently, the ICBL conferences are forums to exchange recent trends, research findings, and disseminate practical experiences in collaborative and blended learning, and engineering pedagogy. The conference bridges the gap between pure scientific research and the everyday work of educators. Interested readership includes policymakers, academics,
computational physicists, educators, researchers in pedagogy and learning theory, school teachers, industry-centric educators, continuing education practitioners, etc.

Computational Physics

Our future scientists and professionals must be conversant in computational techniques. In order to facilitate integration of computer methods into existing physics courses, this textbook offers a large number of worked examples and problems with fully guided solutions in Python as well as other languages (Mathematica, Java, C, Fortran, and Maple). It's also intended as a self-study guide for learning how to use computer methods in physics. The authors include an introductory chapter on numerical tools and indication of computational and physics difficulty level for each problem. Readers also benefit from the following features: • Detailed explanations and solutions in various coding languages. • Problems are ranked based on computational and physics difficulty. • Basics of numerical methods covered in an introductory chapter. • Programming guidance via flowcharts and pseudocode.

Rubin Landau is a Distinguished Professor Emeritus in the Department of Physics at Oregon State University in Corvallis and a Fellow of the American Physical Society (Division of Computational Physics). Manuel Jose Paez-Mejia is a Professor of Physics at Universidad de Antioquia in Medellin, Colombia.

Numerical Methods in Physics with Python

Microwave Remote Sensing of Land Surface: Techniques and Methods brings essential coverage of the space techniques of observation on continental surfaces. The authors explore major applications and provide detailed chapters on physical principles, physics of measurement, and data processing for each technique, bringing readers up-to-date descriptions of techniques used by leading scientists in the field of remote sensing and Earth observation. Presents clear-and-concise descriptions of modern methods Explores current remote sensing techniques that include physical aspects of measurement (theory) and their applications Provides physical principles, measurement, and data processing chapters that are included for each technique described

CRC Standard Probability and Statistics Tables and Formulae, Student Edition

This book contains the contributions presented at the 2nd international KES conference on Smart Education and Smart e-Learning, which took place in Sorrento, Italy, June 17-19, 2015. It contains a total of 45 peer-reviewed book chapters that are grouped into several parts: Part 1 - Smart Education, Part 2 – Smart Educational Technology, Part 3 – Smart e-Learning, Part 4 – Smart Professional Training and Teachers’ Education, and Part 5 – Smart Teaching and Training related Topics. This book can be a useful source of research data and valuable information for faculty, scholars, Ph.D. students, administrators, and practitioners - those who are interested in innovative areas of smart education and smart e-learning.

Handbook of Research on Blockchain Technology

This book offers a new approach to introductory scientific computing. It aims to make students comfortable using computers to do science, to provide them with the computational tools and knowledge they need throughout their college careers and into their professional careers, and to show how all the pieces can work together. Rubin Landau introduces the requisite mathematics and computer science in the course of realistic problems, from energy use to the building of skyscrapers to projectile motion with drag. He is attentive to how each discipline uses its own language to describe the same concepts and how computations are concrete instances of the abstract. Landau covers the basics of computation, numerical analysis, and programming from a computational science perspective. The first part of the printed book uses the problem-solving environment Maple as its context, with the same material covered on the accompanying CD as both Maple and Mathematica programs; the second part uses the compiled language Java, with equivalent materials in Fortran90 on the CD; and the final part presents an introduction to LaTeX replete with sample files. Providing the essentials of computing, with practical examples, A First Course in Scientific Computing adheres to the principle that science and engineering students learn computation best while sitting in front of a computer, book in hand, in trial-and-error mode. Not only is it an invaluable learning text and an essential reference for students of mathematics, engineering, physics, and other sciences, but it is also a consummate model for future textbooks in computational science and engineering courses. A broad spectrum of computing tools and examples that can be used throughout an academic career Practical computing aimed at solving realistic problems Both symbolic and numerical computations A multidisciplinary approach: science + math + computer science Maple and Java in the book itself; Mathematica, Fortran90, Maple and Java on the accompanying CD in an interactive workbook format