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Artificial Intelligence in Cyber Security: Impact and Implications Reza Montasari

Handbook of Neuroimaging Data Analysis Hernando Ombao 2016-11-18 This book explores various state-of-the-art aspects behind the statistical analysis of neuroimaging data. It examines the development of novel statistical approaches to model brain data. Designed for researchers in statistics, biostatistics, computer science, cognitive science, computer engineering, biomedical engineering, applied mathematics, physics, and radiology, the book can also be used as a textbook for graduate-level courses in statistics and biostatistics or as a self-study reference for Ph.D. students in statistics, biostatistics, psychology, neuroscience, and computer science.

Spatiotemporal Analysis of Air Pollution and Its Application in Public Health Lixin Li 2019-11-13 Spatiotemporal Analysis of Air Pollution and Its Application in Public Health reviews, in detail, the tools needed to understand the spatial temporal distribution and trends of air pollution in the atmosphere, including how this information can be tied into the diverse amount of public health data available using accurate GIS techniques. By utilizing GIS to monitor, analyze and visualize air pollution problems, it has proven to not only be the most powerful, accurate and flexible way to understand the atmosphere, but also a great way to understand the impact air pollution has in diverse populations. This book is essential reading for novices and experts in atmospheric science, geography and any allied fields investigating air pollution. Introduces readers to the benefits and uses of geo-spatiotemporal analyses of big data to reveal new and greater understanding of the intersection of air pollution and health Ties in machine learning to improve speed and efficacy of data models Includes developing visualizations, historical data, and real-time air pollution in large geographic areas

Practical Machine Learning for Data Analysis Using Python Abdulhamit Subasi 2020-06-05 Practical Machine Learning for Data Analysis Using Python is a problem solver's guide for creating real-world intelligent systems. It provides a comprehensive approach with concepts, practices, hands-on examples, and sample code. The book teaches readers the vital skills required to understand and solve different problems with machine learning. It teaches machine learning techniques necessary to become a successful practitioner, through the presentation of real-world case studies in Python machine learning ecosystems. The book also focuses on building a foundation of machine learning knowledge to solve different real-world case studies across various fields, including biomedical signal analysis, healthcare, security, economics, and finance. Moreover, it covers a wide range of machine learning models, including regression, classification, and forecasting. The goal of the book is to help a broad range of readers, including IT professionals, analysts, developers, data scientists, engineers, and graduate students, to solve their own real-world problems. Offers a comprehensive overview of the application of machine learning tools in data analysis across a wide range of subject areas Teaches readers how to apply machine learning techniques to biomedical signals, financial data, and healthcare data Explores important classification and regression algorithms as well as other machine learning techniques Explains how to use Python to handle data extraction, manipulation, and exploration techniques, as well as how to visualize data spread across multiple dimensions and extract useful features

The Oxford Handbook of Functional Brain Imaging in Neuropsychology and Cognitive Neurosciences Andrew C. Papanicolaou 2017 A large part of the contemporary cognitive neuroscience literature involves functional neuroimaging, yet few readers are sufficiently familiar with it to appraise that literature correctly. The purpose of this Handbook is to enable them to understand the neuroimaging methods and evaluate their present contributions and future promise in the fields of cognitive neuroscience and neuropsychology. The chapters contain very accessible descriptions of the various methods and an objective account of their clinical and research applications.

Brain and Human Body Modeling Sergey Makarov 2019-01-01 This open access book describes modern applications of computational human modeling with specific emphasis in the areas of neurology and neuroelectromagnetics, depression and cancer treatments, radio-frequency studies and wireless communications. Special consideration is also given to the use of human modeling to the computational assessment of relevant regulatory and safety requirements. Readers working on applications that may expose human subjects to electromagnetic radiation will benefit from this book's coverage of the latest developments in computational modelling and human phantom development to assess a given technology's safety and efficacy in a timely manner. Describes construction and application of computational human models including anatomically detailed and subject specific models; Explains new practices in computational human modeling for neuroelectromagnetics, electromagnetic safety, and exposure evaluations; Includes a survey of modern applications for which computational human models are critical; Describes cellular-level interactions between the human body and electromagnetic fields.

Deformation Mechanisms, Rheology and Tectonics David J. Prior 2011 This collection of papers presents recent advances in the study of deformation mechanisms and rheology and their applications to tectonics. Many of the contributions exploit new petrofabric techniques, particularly electron backscatter diffraction, to help understand the evolution of rock microstructure and mechanical properties. Papers in the first section (lattice preferred orientations and anisotropy) show a growing emphasis on the determination of elastic properties from petrofabrics, from which acoustic properties can be computed for comparison with in-situ seismic measurements. Such research will underpin geodynamic interpretation of large-scale active tectonics. Contributions in the second section (microstructures, mechanisms and rheology) study the relations between microstructural evolution during deformation and mechanical properties.

Tensors in Image Processing and Computer Vision Santiago Aja-Fernández 2009-05-21 Tensor signal processing is an emerging field with important applications to computer vision and image processing. This book presents the state of the art in this new branch of signal processing, offering a great deal of research and discussions by leading experts in the area. The wide-ranging volume offers an overview into cutting-edge research into the newest tensor processing techniques and their application to different domains related to computer vision and image processing. This comprehensive text will prove to be an invaluable reference and resource for researchers, practitioners and advanced students working in the area of computer vision and image processing.

User-Defined Tensor Data Analysis Bin Dong 2021 This SpringerBrief introduces FasTensor, a powerful parallel data programming model developed for big data applications. This book also provides a user's guide for installing and using FasTensor. FasTensor enables users to easily express many data analysis operations, which may come from neural networks, scientific computing, or queries from traditional database management systems (DBMS). FasTensor frees users from all underlying and tedious data management tasks, such as data partitioning, communication, and parallel execution. This SpringerBrief gives a high-level overview of the state-of-the-art in parallel data programming model and a motivation for the design of FasTensor. It illustrates the FasTensor application programming interface (API) with an abundance of examples and two real use cases from

cutting edge scientific applications. FasTensor can achieve multiple orders of magnitude speedup over Spark and other peer systems in executing big data analysis operations. FasTensor makes programming for data analysis operations at large scale on supercomputers as productively and efficiently as possible. A complete reference of FasTensor includes its theoretical foundations, C++ implementation, and usage in applications. Scientists in domains such as physical and geosciences, who analyze large amounts of data will want to purchase this SpringerBrief. Data engineers who design and develop data analysis software and data scientists, and who use Spark or TensorFlow to perform data analyses, such as training a deep neural network will also find this SpringerBrief useful as a reference tool.

Big Data and Visual Analytics Sang C. Suh 2018-01-15 This book provides users with cutting edge methods and technologies in the area of big data and visual analytics, as well as an insight to the big data and data analytics research conducted by world-renowned researchers in this field. The authors present comprehensive educational resources on big data and visual analytics covering state-of-the art techniques on data analytics, data and information visualization, and visual analytics. Each chapter covers specific topics related to big data and data analytics as virtual data machine, security of big data, big data applications, high performance computing cluster, and big data implementation techniques. Every chapter includes a description of an unique contribution to the area of big data and visual analytics. This book is a valuable resource for researchers and professionals working in the area of big data, data analytics, and information visualization. Advanced-level students studying computer science will also find this book helpful as a secondary textbook or reference.

Techno-Societal 2020 Prashant M. Pawar 2021-05-19 This book, divided in two volumes, originates from Techno-Societal 2020: the 3rd International Conference on Advanced Technologies for Societal Applications, Maharashtra, India, that brings together faculty members of various engineering colleges to solve Indian regional relevant problems under the guidance of eminent researchers from various reputed organizations. The focus of this volume is on technologies that help develop and improve society, in particular on issues such as sensor and ICT based technologies for the betterment of people, Technologies for agriculture and healthcare, micro and nano technological applications. This conference aims to help innovators to share their best practices or products developed to solve specific local problems which in turn may help the other researchers to take inspiration to solve problems in their region. On the other hand, technologies proposed by expert researchers may find applications in different regions. This offers a multidisciplinary platform for researchers from a broad range of disciplines of Science, Engineering and Technology for reporting innovations at different levels.

Data Science and Analytics (with Python, R and SPSS Programming) V.K. Jain The Book has been written completely as per AICTE recommended syllabus on "Data Sciences". **SALIENT FEATURES OF THE BOOK:** Explains how data is collected, managed and stored for data science. With complete courseware for understand the key concepts in data science including their real-world applications and the toolkit used by data scientists. Implement data collection and management. Provided with state of the arts subjectwise. With all required tutorials on R, Python and Bokeh, Anaconda, IBM SPSS-21 and Matplotlib.

Diffusion Tensor Imaging Wim Van Hecke 2015-12-14 This book provides an overview of the practical aspects of diffusion tensor imaging (DTI), from understanding the basis of the technique through selection of the right protocols, trouble-shooting data quality, and analyzing DTI data optimally. DTI is a non-invasive magnetic resonance imaging (MRI) technique for visualizing and quantifying tissue microstructure based on diffusion. The book discusses the theoretical background underlying DTI and advanced techniques based on higher-order models and multi-shell diffusion imaging. It covers the practical implementation of DTI; derivation of information from DTI data; and a range of clinical applications, including neurosurgical planning and the assessment of brain tumors. Its practical utility is enhanced by decision schemes and a fully annotated DTI brain atlas, including color fractional anisotropy maps and 3D tractography reconstructions of major white matter fiber bundles. Featuring contributions from leading specialists in the field of DTI, **Diffusion Tensor Imaging: A Practical Handbook** is a valuable resource for radiologists, neuroradiologists, MRI technicians and clinicians.

Multilinear Subspace Learning Haiping Lu 2013-12-11 Due to advances in sensor, storage, and networking technologies, data is being generated on a daily basis at an ever-increasing pace in a wide range of applications, including cloud computing, mobile Internet, and medical imaging. This large multidimensional data requires more efficient dimensionality reduction schemes than the traditional techniques. Addressing this need, multilinear subspace learning (MSL) reduces the dimensionality of big data directly from its natural multidimensional representation, a tensor. **Multilinear Subspace Learning: Dimensionality Reduction of Multidimensional Data** gives a comprehensive introduction to both theoretical and practical aspects of MSL for the dimensionality reduction of multidimensional data based on tensors. It covers the fundamentals, algorithms, and applications of MSL. Emphasizing essential concepts and system-level perspectives, the authors provide a foundation for solving many of today's most interesting and challenging problems in big multidimensional data processing. They trace the history of MSL, detail recent advances, and explore future developments and emerging applications. The book follows a unifying MSL framework formulation to systematically derive representative MSL algorithms. It describes various applications of the algorithms, along with their pseudocode. Implementation tips help practitioners in further development, evaluation, and application. The book also provides researchers with useful theoretical information on big multidimensional data in machine learning and pattern recognition. MATLAB® source code, data, and other materials are available at www.comp.hkbu.edu.hk/~haiping/MSL.html

Applied Artificial Intelligence Wolfgang Beer About This Book Step into the amazing world of Artificial Intelligence and Machine Learning using this compact and easy to understand book. Dive into Neural Networks and Deep Learning and create your own production ready AI models by using TensorFlow and Keras. Work through simple yet insightful examples that will get you up and running with Artificial Intelligence, TensorFlow and Keras in no time. Who This Book Is For This book is for Python developers who want to understand Neural Networks from ground up and build real-world Artificial Intelligence applications. This book is friendly to Python beginners, but being familiar with Python would be useful to play around with the code. What You Will Learn The basic structure and functionality of a Neuron The basic math behind the Neural Network learning process See how to build a simple character recognition model from ground up What classification, regression and clustering is How to use TensorFlow to build production ready models Build a first model with the Keras framework How to predict the survival chance for Titanic passengers How to build a simple book recommender How to detect toxic language with an AI model In Detail Artificial Intelligence became one of the hottest topics in the modern economy, where everything is driven by software, network and data. There exists nearly no startup nor traditional business where Artificial Intelligence is not used extensively across many fields such as search engines, image recognition, robotics or finance. This book gives a ground up, step by step introduction about how a Neural Network is used to learn a given function and to make intelligent data-driven decisions. The book explains how to identify typical use-cases such as classification, regression and clustering in terms of practical and well known use-cases. This book comes with an introduction into the state-of-the-art Google TensorFlow framework that allows developers to roll out their models in production. On top of TensorFlow, the Keras library is used to simplify the design and training of complex deep-learning models. This book comes with multiple examples that show how to apply Artificial Intelligence and Machine Learning models for use-cases such as handwriting recognition, decision making, text analysis and toxic comment identification as well as the use of AI to recommend products to customers.

Deep Learning for Remote Sensing Images with Open Source Software Rémi Cresson 2020-07-16 In today's world, deep learning source codes and a plethora of open access geospatial images are readily available and easily accessible. However, most people are missing the educational tools to make use of this resource. **Deep Learning for Remote Sensing Images with Open Source Software** is the first practical book to introduce deep learning techniques using free open source tools for processing real world remote sensing images. The approaches detailed in this book are generic and can be adapted to suit many different applications for remote sensing image processing, including landcover mapping, forestry, urban studies, disaster mapping, image restoration, etc. Written with practitioners and students in mind, this book helps link together the theory and practical use of existing tools and data to apply deep learning techniques on remote sensing images and data. **Specific Features of this Book:** The first book that explains how to apply deep learning techniques to public, free available data (Spot-7 and Sentinel-2 images, OpenStreetMap vector data), using open source software (QGIS, Orfeo ToolBox, TensorFlow) Presents approaches suited for real world images and data targeting large scale processing and GIS applications Introduces state of the art deep learning architecture families that can be applied to remote sensing world, mainly for landcover mapping, but also for generic approaches (e.g. image restoration) Suited for deep learning beginners and readers with some GIS knowledge. No coding knowledge is required to learn practical skills. Includes deep learning techniques through many step by step remote sensing data processing exercises.

Artificial Intelligence and Ophthalmology Parul Ichhpujani 2021-04-22 The book helps to explore the vast expanse of artificial intelligence-based scientific content that has been published in the last few years. Ophthalmology has recently undergone a silent digital revolution, with machine learning and deep learning algorithms consistently outperforming human graders in studies published across the globe. It is high time that a resource that breaks this information behemoth into easily digestible bits comes to the fore. This book simplifies the complex mechanics of algorithms used in ophthalmology and vision science applications. It also tries to address potential ethical

issues with machines entering our clinics and patients' lives. Overall it is essential reading for ophthalmologists/eye care professionals interested in artificial intelligence and everyone who is looking for a deep dive into the exciting world of digital medicine.

The Digital Journey of Banking and Insurance, Volume III Volker Liermann 2021-10-27 This book, the third one of three volumes, focuses on data and the actions around data, like storage and processing. The angle shifts over the volumes from a business-driven approach in "Disruption and DNA" to a strong technical focus in "Data Storage, Processing and Analysis", leaving "Digitalization and Machine Learning Applications" with the business and technical aspects in-between. In the last volume of the series, "Data Storage, Processing and Analysis", the shifts in the way we deal with data are addressed.

artificial Intelligence / Machine Learning In Marketing James Seligman 2020-02-17 The theory and practice of AI and ML in marketing saving time, money

Soft Computing Based Medical Image Analysis Nilanjan Dey 2018-01-18 Soft Computing Based Medical Image Analysis presents the foremost techniques of soft computing in medical image analysis and processing. It includes image enhancement, segmentation, classification-based soft computing, and their application in diagnostic imaging, as well as an extensive background for the development of intelligent systems based on soft computing used in medical image analysis and processing. The book introduces the theory and concepts of digital image analysis and processing based on soft computing with real-world medical imaging applications.

Comparative studies for soft computing based medical imaging techniques and traditional approaches in medicine are addressed, providing flexible and sophisticated application-oriented solutions. Covers numerous soft computing approaches, including fuzzy logic, neural networks, evolutionary computing, rough sets and Swarm intelligence Presents transverse research in soft computing formation from various engineering and industrial sectors in the medical domain Highlights challenges and the future scope for soft computing based medical analysis and processing techniques

Molecular Imaging Bernhard Schaller 2012-03-16 The present book gives an exceptional overview of molecular imaging. Practical approach represents the red thread through the whole book, covering at the same time detailed background information that goes very deep into molecular as well as cellular level. Ideas how molecular imaging will develop in the near future present a special delicacy. This should be of special interest as the contributors are members of leading research groups from all over the world.

Tensor Calculus and Analytical Dynamics John G. Papastavridis 1998-12-18 Tensor Calculus and Analytical Dynamics provides a concise, comprehensive, and readable introduction to classical tensor calculus - in both holonomic and nonholonomic coordinates - as well as to its principal applications to the Lagrangean dynamics of discrete systems under positional or velocity constraints. The thrust of the book focuses on formal structure and basic geometrical/physical ideas underlying most general equations of motion of mechanical systems under linear velocity constraints. Written for the theoretically minded engineer, Tensor Calculus and Analytical Dynamics contains uniquely accessible treatments of such intricate topics as: tensor calculus in nonholonomic variables Pfaffian nonholonomic constraints related integrability theory of Frobenius The book enables readers to move quickly and confidently in any particular geometry-based area of theoretical or applied mechanics in either classical or modern form.

Smart Innovations in Engineering and Technology Ryszard Klempous 2019-11-28 This easy-to-understand book discusses applications of current technologies and the foundations for their extension into emerging areas in the future. It includes research presented at two conferences: 5th International IBM Cloud Academy Conference, 2017, held in Wroc?aw, Poland. 5th Asia?Pacific Conference on Computer Assisted and System Engineering, 2017, held in Guilin, China. These conferences focused on system and application engineering, including achievements in the interdisciplinary topics of cloud computing, big data, IoT and mobile communications. Featuring 19 chapters, the book has the potential to influence current and future research and applications combining the best attributes of computing, mathematics, artificial intelligence, biometrics and software engineering to create a comprehensive research application domain.

Proceedings Of The Julian Schwinger Centennial Conference Englert Berthold-georg 2019-10-30 The Julian Schwinger Centennial Conference of 2018 assembled many of Schwinger's students, colleagues, and friends to celebrate this towering figure of twentieth century physics one hundred years after his birth. This proceedings volume collects talks delivered on this occasion. They cover a wide range of topics, all related to Schwinger's rich scientific legacy — supplemented by personal recollections about Julian Schwinger, the physicist, the teacher, and the gentleman. Also included are an essay of 1985, co-authored by Schwinger but not published previously, as well as the transcripts of speeches by distinguished colleagues at the 1978 gathering when Schwinger's sixtieth birthday was celebrated.

Practical Data Science with SAP Greg Foss 2019-09-18 Learn how to fuse today's data science tools and techniques with your SAP enterprise resource planning (ERP) system. With this practical guide, SAP veterans Greg Foss and Paul Modderman demonstrate how to use several data analysis tools to solve interesting problems with your SAP data. Data engineers and scientists will explore ways to add SAP data to their analysis processes, while SAP business analysts will learn practical methods for answering questions about the business. By focusing on grounded explanations of both SAP processes and data science tools, this book gives data scientists and business analysts powerful methods for discovering deep data truths. You'll explore: Examples of how data analysis can help you solve several SAP challenges Natural language processing for unlocking the secrets in text Data science techniques for data clustering and segmentation Methods for detecting anomalies in your SAP data Data visualization techniques for making your data come to life

Introduction to Environmental Data Analysis and Modeling Moses Eterigho Emetere 2020-01-03 This book introduces numerical methods for processing datasets which may be of any form, illustrating adequately computational resolution of environmental alongside the use of open source libraries. This book solves the challenges of misrepresentation of datasets that are relevant directly or indirectly to the research. It illustrates new ways of screening datasets or images for maximum utilization. The adoption of various numerical methods in dataset treatment would certainly create a new scientific approach. The book enlightens researchers on how to analyse measurements to ensure 100% utilization. It introduces new ways of data treatment that are based on a sound mathematical and computational approach.

Tensor Analysis Liqun Qi 2017-04-19 Tensors, or hypermatrices, are multi-arrays with more than two indices. In the last decade or so, many concepts and results in matrix theory?some of which are nontrivial?have been extended to tensors and have a wide range of applications (for example, spectral hypergraph theory, higher order Markov chains, polynomial optimization, magnetic resonance imaging, automatic control, and quantum entanglement problems). The authors provide a comprehensive discussion of this new theory of tensors. Tensor Analysis: Spectral Theory and Special Tensors is unique in that it is the first book on these three subject areas: spectral theory of tensors; the theory of special tensors, including nonnegative tensors, positive semidefinite tensors, completely positive tensors, and copositive tensors; and the spectral hypergraph theory via tensors.

Deep Learning Rajiv Chopra A good book is like a teacher who sits behind the reader and guides him/her accordingly. Deep Learning has been an area of current research. After toiling through the various concepts of Deep Learning, the book slithers around all principles of deep learning. This book highlights in deep the concepts of deep learning so that new projects and researchers can be done. The book serves, both as textbook and as a reference book. Some of the highlights of the book are: Simple Language, Recent Concepts of Machine and Deep Learning explained, MCQ's, Conceptual Short Questions & Answers, Case Studies, Case Tools (like TensorFlow, H2O etc).

Handbook of Research on Engineering, Business, and Healthcare Applications of Data Science and Analytics Patil, Bhushan 2020-10-23 Analyzing data sets has continued to be an invaluable application for numerous industries. By combining different algorithms, technologies, and systems used to extract information from data and solve complex problems, various sectors have reached new heights and have changed our world for the better. The Handbook of Research on Engineering, Business, and Healthcare Applications of Data Science and Analytics is a collection of innovative research on the methods and applications of data analytics. While highlighting topics including artificial intelligence, data security, and information systems, this book is ideally designed for researchers, data analysts, data scientists, healthcare administrators, executives, managers, engineers, IT consultants, academicians, and students interested in the potential of data application technologies.

Intraoperative Imaging and Image-Guided Therapy Ferenc A. Jolesz 2014-01-14 Image-guided therapy (IGT) uses imaging to improve the localization and targeting of diseased tissue and to monitor and control treatments.

During the past decade, image-guided surgeries and image-guided minimally invasive interventions have emerged as advances that can be used in place of traditional invasive approaches. Advanced imaging technologies such as magnetic resonance imaging (MRI), computed tomography (CT), and positron emission tomography (PET) entered into operating rooms and interventional suites to complement already-available routine imaging devices like X-ray and ultrasound. At the same time, navigational tools, computer-assisted surgery devices, and image-guided robots also became part of the revolution in interventional radiology suites and the operating room.

Intraoperative Imaging and Image-Guided Therapy explores the fundamental, technical, and clinical aspects of state-of-the-art image-guided therapies. It presents the basic concepts of image guidance, the technologies involved in therapy delivery, and the special requirements for the design and construction of image-guided operating rooms and interventional suites. It also covers future developments such as molecular imaging-guided surgeries and novel innovative therapies like MRI-guided focused ultrasound surgery. IGT is a multidisciplinary and multimodality field in which teams of physicians, physicists, engineers, and computer scientists collaborate in performing these interventions, an approach that is reflected in the organization of the book. Contributing authors include members of the National Center of Image-Guided Therapy program at Brigham and Women's Hospital and international leaders in the field of IGT. The book includes coverage of these topics: - Imaging methods, guidance technologies, and the therapy delivery systems currently used or in development. - Clinical applications for IGT in various specialties such as neurosurgery, ear-nose-and-throat surgery, cardiovascular surgery, endoscopies, and orthopedic procedures. - Review and comparison of the clinical uses for IGT with conventional methods in terms of invasiveness, effectiveness, and outcome. - Requirements for the design and construction of image-guided operating rooms and interventional suites.

The Impact of Digital Transformation and FinTech on the Finance Professional Volker Liermann 2019-10-02 This book demystifies the developments and defines the buzzwords in the wide open space of digitalization and finance, exploring the space of FinTech through the lens of the financial services professional and what they need to know to stay ahead. With chapters focusing on the customer interface, payments, smart contracts, workforce automation, robotics, crypto currencies and beyond, this book aims to be the go-to guide for professionals in financial services and banking on how to better understand the digitalization of their industry.? The book provides an outlook of the impact digitalization will have in the daily work of a CFO/CRO and a structural influence to the financial management (including risk management) department of a bank.

Open-Source Software for Neurodata Curation and Analysis William T. Katz 2022-07-06

Euclidean Tensor Calculus with Applications Iulian Beju 1983

Advances in Intelligent Systems and Computing II Natalia Shakhovska 2017-11-20 This book reports on new theories and applications in the field of intelligent systems and computing. It covers computational and artificial intelligence methods, as well as advances in computer vision, current issues in big data and cloud computing, computation linguistics, and cyber-physical systems. It also reports on data mining and knowledge extraction technologies, as well as central issues in intelligent information management. Written by active researchers, the respective chapters are based on papers presented at the International Conference on Computer Science and Information Technologies (CSIT 2017), held on September 5–8, 2017, in Lviv, Ukraine; and at two workshops accompanying the conference: one on inductive modeling, jointly organized by the Lviv Polytechnic National University and the National Academy of Science of Ukraine; and another on project management, which was jointly organized by the Lviv Polytechnic National University, the International Project Management Association, the Ukrainian Project Management Association, the Kazakhstan Project Management Association, and Nazarbayev University. Given its breadth of coverage, the book provides academics and professionals with extensive information and a timely snapshot of the field of intelligent systems, and is sure to foster new discussions and collaborations among different groups.

Neural Networks and Statistical Learning Ke-Lin Du 2019-09-12 This book provides a broad yet detailed introduction to neural networks and machine learning in a statistical framework. A single, comprehensive resource for study and further research, it explores the major popular neural network models and statistical learning approaches with examples and exercises and allows readers to gain a practical working understanding of the content. This updated new edition presents recently published results and includes six new chapters that correspond to the recent advances in computational learning theory, sparse coding, deep learning, big data and cloud computing. Each chapter features state-of-the-art descriptions and significant research findings. The topics covered include: • multilayer perceptron; • the Hopfield network; • associative memory models; • clustering models and algorithms; • the radial basis function network; • recurrent neural networks; • nonnegative matrix factorization; • independent component analysis; • probabilistic and Bayesian networks; and • fuzzy sets and logic. Focusing on the prominent accomplishments and their practical aspects, this book provides academic and technical staff, as well as graduate students and researchers with a solid foundation and comprehensive reference on the fields of neural networks, pattern recognition, signal processing, and machine learning.

Visualization and Processing of Tensors and Higher Order Descriptors for Multi-Valued Data Carl-Fredrik Westin 2014-07-17 Arising from the fourth Dagstuhl conference entitled Visualization and Processing of Tensors and Higher Order Descriptors for Multi-Valued Data (2011), this book offers a broad and vivid view of current work in this emerging field. Topics covered range from applications of the analysis of tensor fields to research on their mathematical and analytical properties. Part I, Tensor Data Visualization, surveys techniques for visualization of tensors and tensor fields in engineering, discusses the current state of the art and challenges, and examines tensor invariants and glyph design, including an overview of common glyphs. The second Part, Representation and Processing of Higher-order Descriptors, describes a matrix representation of local phase, outlines mathematical morphological operations techniques, extended for use in vector images, and generalizes erosion to the space of diffusion weighted MRI. Part III, Higher Order Tensors and Riemannian-Finsler Geometry, offers powerful mathematical language to model and analyze large and complex diffusion data such as High Angular Resolution Diffusion Imaging (HARDI) and Diffusion Kurtosis Imaging (DKI). A Part entitled Tensor Signal Processing presents new methods for processing tensor-valued data, including a novel perspective on performing voxel-wise morphometry of diffusion tensor data using kernel-based approach, explores the free-water diffusion model, and reviews proposed approaches for computing fabric tensors, emphasizing trabecular bone research. The last Part, Applications of Tensor Processing, discusses metric and curvature tensors, two of the most studied tensors in geometry processing. Also covered is a technique for diagnostic prediction of first-episode schizophrenia patients based on brain diffusion MRI data. The last chapter presents an interactive system integrating the visual analysis of diffusion MRI tractography with data from electroencephalography.

Intelligent Systems Design and Applications Ajith Abraham 2019-04-13 This book highlights recent research on Intelligent Systems and Nature Inspired Computing. It presents 212 selected papers from the 18th International Conference on Intelligent Systems Design and Applications (ISDA 2018) and the 10th World Congress on Nature and Biologically Inspired Computing (NaBIC), which was held at VIT University, India. ISDA-NaBIC 2018 was a premier conference in the field of Computational Intelligence and brought together researchers, engineers and practitioners whose work involved intelligent systems and their applications in industry and the “real world.” Including contributions by authors from over 40 countries, the book offers a valuable reference guide for all researchers, students and practitioners in the fields of Computer Science and Engineering.

Redefining Standard Model Cosmology Brian Albert Robson 2019-06-12 The current standard model of cosmology is based primarily on two incompatible theoretical models: (1) the standard model of particle physics, which describes the physics of the very small in terms of quantum mechanics, and (2) the general theory of relativity, which describes the physics of the very large in terms of classical physics. Both these theoretical models are considered to be incomplete in the sense that they do not provide any understanding of several empirical observations, such as the Big Bang, dark matter, dark energy, gravity, and matter-antimatter asymmetry in the universe. The main aim of this book is to discuss these serious problems that threaten to undermine the current standard model of cosmology.

Cloud Computing for Machine Learning and Cognitive Applications Kai Hwang 2017-06-16 The first textbook to teach students how to build data analytic solutions on large data sets using cloud-based technologies. This is the first textbook to teach students how to build data analytic solutions on large data sets (specifically in Internet of Things applications) using cloud-based technologies for data storage, transmission and mashup, and AI techniques to analyze this data. This textbook is designed to train college students to master modern cloud computing systems in operating principles, architecture design, machine learning algorithms, programming models and software tools for big data mining, analytics, and cognitive applications. The book will be suitable for use in one-semester computer science or electrical engineering courses on cloud computing, machine learning, cloud programming, cognitive computing, or big data science. The book will also be very useful as a reference for professionals who want to work in cloud computing and data science. Cloud and Cognitive Computing begins with two introductory chapters on fundamentals of cloud computing, data science, and adaptive computing that lay the foundation for the rest of the book. Subsequent chapters cover topics including cloud architecture, mashup services, virtual machines, Docker containers, mobile clouds, IoT and AI, inter-cloud mashups, and cloud performance and benchmarks, with a focus on Google's Brain Project, DeepMind, and X-Lab programs, IBKai HwangM SyNapse, Bluemix programs, cognitive initiatives, and neurocomputers. The book then covers machine learning algorithms and cloud programming software tools and application development, applying the tools in machine learning, social media, deep learning, and cognitive applications. All cloud systems are illustrated with big data and cognitive application examples.

E-Learning as a Socio-Cultural System: A Multidimensional Analysis Zuzevi?i??, Vaiva 2014-06-30 Information and communication technologies play a crucial role in a number of modern industries. Among these, education

has perhaps seen the greatest increases in efficiency and availability through Internet-based technologies. E-Learning as a Socio-Cultural System: A Multidimensional Analysis provides readers with a critical examination of the theories, models, and best practices in online education from a social perspective, evaluating blended, distance, and mobile learning systems with a focus on the interactions of their practitioners. Within the pages of this volume, teachers, students, administrators, policy makers, and IT professionals will all find valuable advice and enriching personal experiences in the field of online education.