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Computational Analysis and Understanding of Natural Languages: Principles, Methods and Applications 2018-08-27 Computational Analysis and Understanding of Natural Languages: Principles, Methods and Applications, Volume 38, the latest release in this monograph that provides a cohesive and integrated exposition of these advances and associated applications, includes new chapters on Linguistics: Core Concepts and Principles, Grammars, Open-Source Libraries, Application Frameworks, Workflow Systems, Mathematical Essentials, Probability, Inference and Prediction Methods, Random Processes, Bayesian Methods, Machine Learning, Artificial Neural Networks for Natural Language Processing, Information Retrieval, Language Core Tasks, Language Understanding Applications, and more. The synergistic confluence of linguistics, statistics, big data, and high-performance computing is the underlying force for the recent and dramatic advances in analyzing and understanding natural languages, hence making this series all the more important. Provides a thorough treatment of open-source libraries, application frameworks and workflow systems for natural language analysis and understanding Presents new chapters on Linguistics: Core Concepts and Principles, Grammars, Open-Source Libraries, Application Frameworks, Workflow Systems, Mathematical Essentials, Probability, and more

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).

Hyperspectral Image Analysis Saurabh Prasad 2020-04-27 This book reviews the state of the art in algorithmic approaches addressing the practical challenges that arise with hyperspectral image analysis tasks, with a focus on emerging trends in machine learning and image processing/understanding. It presents advances in deep learning, multiple instance learning, sparse representation based learning, low-dimensional manifold models, anomalous change detection, target recognition, sensor fusion and super-resolution for robust multispectral and hyperspectral image understanding. It presents research from leading international experts who have made foundational contributions in these areas. The book covers a diverse array of applications of multispectral/hyperspectral imagery in the context of these algorithms, including remote sensing, face recognition and biomedicine. This book would be particularly beneficial to graduate students and researchers who are taking advanced courses in (or are working in) the areas of image analysis, machine learning and remote sensing with multi-channel optical imagery. Researchers and professionals in academia and industry working in areas such as electrical engineering, civil and environmental engineering, geosciences and biomedical image processing, who work with multi-channel optical data will find this book useful.

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

Image Analysis, Classification and Change Detection in Remote Sensing Morton John Canty 2019-03-11 Image Analysis, Classification and Change Detection in Remote Sensing: With Algorithms for Python, Fourth Edition, is focused on the development and implementation of statistically motivated, data-driven techniques for digital image analysis of remotely sensed imagery and it features a tight interweaving of statistical and machine learning theory of algorithms with computer codes. It develops statistical methods for the analysis of optical/infrared and synthetic aperture radar (SAR) imagery, including wavelet transformations, kernel methods for nonlinear classification, as well as an introduction to deep learning in the context of feed forward neural networks. New in the Fourth Edition: An in-depth treatment of a recent sequential change detection algorithm for polarimetric SAR image time series. The accompanying software consists of Python (open source) versions of all of the main image analysis algorithms. Presents easy, platform-independent software installation methods (Docker containerization). Utilizes freely accessible imagery via the Google Earth Engine and provides many examples of cloud programming (Google Earth Engine API). Examines deep learning examples including TensorFlow and a sound introduction to neural networks, Based on the success and the reputation of the previous editions and compared to other textbooks in the market, Professor Canty's fourth edition differs in the depth and sophistication of the material treated as well as in its consistent use of computer codes to illustrate the methods and algorithms discussed. It is self-contained and illustrated with many programming examples, all of which can be conveniently run in a web browser. Each chapter concludes with exercises complementing or extending the material in the text.

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

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.

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.

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.

Software Engineering and Algorithms in Intelligent Systems Radek Silhavy 2018-05-16 This book presents new software engineering approaches and methods, discussing real-world problems and exploratory research that describes novel approaches, modern design techniques, hybrid algorithms and empirical methods. This book constitutes part of the refereed proceedings of the Software Engineering and Algorithms in Intelligent Systems Section of the 7th Computer Science On-line Conference 2018 (CSOC 2018), held in April 2018.

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.

The Oxford Handbook of Functional Brain Imaging in Neuropsychology and Cognitive Neurosciences Andrew C. Papanicolaou 2017 The Oxford Handbook of Functional Brain Imaging in Neuropsychology and Cognitive Neurosciences describes in a readily accessible manner the several functional neuroimaging methods and critically appraises their applications that today account for a large part of the contemporary cognitive neuroscience and neuropsychology literature. The complexity and the novelty of these methods often cloud appreciation of the methods' contributions and future promise. The Handbook begins with an overview of the basic concepts of functional brain imaging common to all methods, and proceeds with a description of each of them, namely magnetoencephalography (MEG), functional magnetic resonance imaging (fMRI), positron emission tomography (PET), diffusion tensor imaging (DTI), and transcranial magnetic stimulation (TMS). Its second part covers the various research applications of functional neuroimaging on issues like the function of the default mode network; the possibility and the utility of imaging of consciousness; the search for mnemonic traces of concepts; human will and decision-making; motor cognition; language; the mechanisms of affective states and pain; the presurgical mapping of the brain; and others. As such, the volume reviews the methods and their contributions to current research and comments on the degree to which they have enhanced our understanding of the relation between neurophysiological activity and sensory, motor, and cognitive functions. Moreover, it carefully considers realistic contributions of functional neuroimaging to future endeavors in cognitive neuroscience, medicine, and neuropsychology.

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

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.

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.

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

Artificial Intelligence in Cyber Security: Impact and Implications Reza Montasari

Machine Learning Seyedeh Leili Mirtaheri 2022-09-29 The book reviews core concepts of machine learning (ML) while focusing on modern applications. It is aimed at those who want to advance their understanding of ML by providing technical and practical insights. It does not use complicated mathematics to explain how to benefit from ML algorithms. Unlike the existing literature, this work provides the core concepts with emphasis on fresh ideas and real application scenarios. It starts with the basic concepts of ML and extends the concepts to the different deep learning algorithms. The book provides an introduction and main elements of evaluation tools with Python and walks you through the recent applications of ML in self-driving cars, cognitive decision making, communication networks, security, and signal processing. The concept of generative networks is also presented and focuses on GANs as a tool to improve the performance of existing algorithms. In summary, this book provides a comprehensive technological path from fundamental theories to the categorization of existing algorithms, covers state-of-the-art, practical evaluation tools and methods to empower you to use synthetic data to improve the performance of applications.

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.

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.

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.

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.

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 accessbile 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.

Measuring the 21st Century Science and Engineering Workforce Population National Academies of Sciences, Engineering, and Medicine 2018-04-13 The National Science Foundation's National Center for Science and Engineering Statistics (NCSES), one of the nation's principal statistical agencies, is charged to collect, acquire, analyze, report, and disseminate statistical data related to the science and engineering enterprise in the United States and other nations that is relevant and useful to practitioners, researchers, policymakers, and to the public. NCSES data, based primarily on several flagship surveys, have become the major evidence base for American science and technology policy, and the agency is well respected globally for these data. This report assesses and provides guidance on NCSES's approach to measuring the science and engineering workforce population in the United States. It also proposes a framework for measuring the science and engineering workforce in the next decade and beyond, with flexibility to examine emerging issues related to this unique population while at the same time allowing for stability in the estimation of key trends

Big Data Analytics Mrutyunjaya Panda 2018-12-12 Social networking has increased drastically in recent years, resulting in an increased amount of data being created daily. Furthermore, diversity of issues and complexity of the social networks pose a challenge in social network mining. Traditional algorithm software cannot deal with such complex and vast amounts of data, necessitating the development of novel analytic approaches and tools. This reference work deals with social network aspects ofbig data analytics. It covers theory, practices and challenges in social networking. The book spans numerous disciplines like neural networking, deep learning, artificial intelligence, visualization, e-learning in higher education, e-healthcare, security and intrusion detection.

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

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.

Open Source Software for Statistical Analysis of Big Data: Emerging Research and Opportunities Segall, Richard S. 2020-02-21 With the development of computing technologies in today's modernized world, software packages have become easily accessible. Open source software, specifically, is a popular method for solving certain issues in the field of computer science. One key challenge is analyzing big data due to the high amounts that organizations are processing. Researchers and professionals need research on the foundations of open source software programs and how they can successfully analyze statistical data. Open Source Software for Statistical Analysis of Big Data: Emerging Research and Opportunities provides emerging research exploring the theoretical and practical aspects of cost-free software possibilities for applications within data analysis and statistics with a specific focus on R and Python. Featuring coverage on a broad range of topics such as cluster analysis, time series forecasting, and machine learning, this book is ideally designed for researchers, developers, practitioners, engineers, academicians, scholars, and students who want to more fully understand in a brief and concise format the realm and technologies of open source software for big data and how it has been used to solve large-scale research problems in a multitude of disciplines.

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

Fundamentals of Data Science Sanjeev J. Wagh 2021-09-20 Fundamentals of Data Science is designed for students, academicians and practitioners with a complete walkthrough right from the foundational groundwork required to outlining all the concepts, techniques and tools required to understand Data Science. Data Science is an umbrella term for the non-traditional techniques and technologies that are required to collect, aggregate, process, and gain insights from massive datasets. This book offers all the processes, methodologies, various steps like data acquisition, pre-process, mining, prediction, and visualization tools for extracting insights from vast amounts of data by the use of various scientific methods, algorithms, and processes Readers will learn the steps necessary to create the application with SQl, NoSQL, Python, R, Matlab, Octave and Tablue. This book provides a stepwise approach to building solutions to data science applications right from understanding the fundamentals, performing data analytics to writing source code. All the concepts are discussed in simple English to help the community to become Data Scientist without much pre-requisite knowledge. Features : Simple strategies for developing statistical models that analyze data and detect patterns, trends, and relationships in data sets. Complete roadmap to Data Science approach with dedicatedsections which includes Fundamentals, Methodology and Tools. Focussed approach for learning and practice various Data Science Toolswith Sample code and examples for practice. Information is presented in an accessible way for students, researchers and academicians and professionals.

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.

  Advances on Tensor Analysis and their Applications Francisco Bulnes 2020-09-09 This book brings together recent advances in tensor analysis and studies of its invariants such as twistors, spinors, kinematic tensors and others belonging to tensor algebras with extended structures to Lie algebras, Kac-Moody algebras, and enveloping algebras, among others. Chapters cover such topics as classical tensors and bilinear forms, tensors for exploring space-time, tensor applications in geometry and continuum media, and advanced topics in tensor analysis such as invariant theory, derived categories, hypercohomologies, k-modules, extensions of kinematic tensors, infinite dimensional operators, and more.

  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.

  Machine Learning with TensorFlow 1.x Quan Hua 2017-11-21 Tackle common commercial machine learning problems with Google's TensorFlow 1.x library and build deployable solutions. About This Book Enter the new era of second-generation machine learning with Python with this practical and insightful guide Set up TensorFlow 1.x for actual industrial use, including high-performance setup aspects such as multi-GPU support Create pipelines for training and using applying classifiers using raw real-world data Who This Book Is For This book is for data scientists and researchers who are looking to either migrate from an existing machine learning library or jump into a machine learning platform headfirst. The book is also for software developers who wish to learn deep learning by example. Particular focus is placed on solving commercial deep learning problems from several industries using TensorFlow's unique features. No commercial domain knowledge is required, but familiarity with Python and matrix math is expected. What You Will Learn Explore how to use different machine learning models to ask different questions of your data Learn how to build deep neural networks using TensorFlow 1.x Cover key tasks such as clustering, sentiment analysis, and regression analysis using TensorFlow 1.x Find out how to write clean and elegant Python code that will optimize the strength of your algorithms Discover how to embed your machine learning model in a web application for increased accessibility Learn how to use multiple GPUs for faster training using AWS In Detail Google's TensorFlow is a game changer in the world of machine learning. It has made machine learning faster, simpler, and more accessible than ever before. This book will teach you how to easily get started with machine learning using the power of Python and TensorFlow 1.x. Firstly, you'll cover the basic installation procedure and explore the capabilities of TensorFlow 1.x. This is followed by training and running the first classifier, and coverage of the unique features of the library including data flow graphs, training, and the visualization of performance with TensorBoard—all within an example-rich context using problems from multiple industries. You'll be able to further explore text and image analysis, and be introduced to CNN models and their setup in TensorFlow 1.x. Next, you'll implement a complete real-life production system from training to serving a deep learning model. As you advance you'll learn about Amazon Web Services (AWS) and create a deep neural network to solve a video action recognition problem. Lastly, you'll convert the Caffe model to TensorFlow and be introduced to the high-level TensorFlow library, TensorFlow-Slim. By the end of this book, you will be geared up to take on any challenges of implementing TensorFlow 1.x in your machine learning environment. Style and approach This comprehensive guide will enable you to understand the latest advances in machine learning and will empower you to implement this knowledge in your machine learning environment.

  User-Defined Tensor Data Analysis Bin Dong 2021 Ths 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.

  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.

  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.

  Euclidean Tensor Calculus with Applications Iulian Beju 1983