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KEY=PRINCIPLES - SPENCE NAVARRO

AN INTRODUCTION TO NEURAL NETWORKS

CRC Press *Though mathematical ideas underpin the study of neural networks, the author presents the fundamentals without the full mathematical apparatus. All aspects of the field are tackled, including artificial neurons as models of their real counterparts; the geometry of network action in pattern space; gradient descent methods, including back-propagation; associative memory and Hopfield nets; and self-organization and feature maps. The traditionally difficult topic of adaptive resonance theory is clarified within a hierarchical description of its operation. The book also includes several real-world examples to provide a concrete focus. This should enhance its appeal to those involved in the design, construction and management of networks in commercial environments and who wish to improve their understanding of network simulator packages. As a comprehensive and highly accessible introduction to one of the most important topics in cognitive and computer science, this volume should interest a wide range of readers, both students and professionals, in cognitive science, psychology, computer science and electrical engineering.*

INTERPRETABLE MACHINE LEARNING

Lulu.com

BRAIN FACTS

A PRIMER ON THE BRAIN AND NERVOUS SYSTEM

DEEP LEARNING

MIT Press *An introduction to a broad range of topics in deep learning, covering mathematical and conceptual background, deep learning techniques used in industry, and research perspectives. "Written by three experts in the field, Deep Learning is the only comprehensive book on the subject." —Elon Musk, cochair of OpenAI; cofounder and CEO of Tesla and SpaceX Deep learning is a form of machine learning that enables computers to learn from experience and understand the world in terms of a hierarchy of concepts. Because the computer gathers knowledge from experience, there is no need for a human computer operator to formally specify all the knowledge that the computer needs. The hierarchy of concepts allows the computer to learn complicated concepts by building them out of simpler ones; a graph of these hierarchies would be many layers deep. This book introduces a broad range of topics in deep learning. The text offers mathematical and conceptual background, covering relevant concepts in linear algebra, probability theory and information theory, numerical computation, and machine learning. It describes deep learning techniques used by practitioners in industry, including deep feedforward networks, regularization, optimization algorithms, convolutional networks, sequence modeling, and practical methodology; and it surveys such applications as natural language processing, speech recognition, computer vision, online recommendation systems, bioinformatics, and videogames. Finally, the book offers research perspectives, covering such theoretical topics as linear factor models, autoencoders, representation learning, structured probabilistic models, Monte Carlo methods, the partition function, approximate inference, and deep generative models. Deep Learning can be used by undergraduate or graduate students planning careers in either industry or research, and by software engineers who want to begin using deep learning in their products or platforms. A website offers supplementary material for both readers and instructors.*

NEURAL NETWORK DESIGN

INFORMATION THEORY, INFERENCE AND LEARNING ALGORITHMS

Cambridge University Press *Table of contents*

MATHEMATICS FOR MACHINE LEARNING

Cambridge University Press *Distills key concepts from linear algebra, geometry, matrices, calculus, optimization, probability and statistics that are used in machine learning.*

SPEECH & LANGUAGE PROCESSING

Pearson Education India

STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES

A PATH FORWARD

National Academies Press *Scores of talented and dedicated people serve the forensic science community, performing vitally important work. However, they are often constrained by lack of adequate resources, sound policies, and national support. It is clear that change and advancements, both systematic and scientific, are needed in a number of forensic science disciplines to ensure the reliability of work, establish enforceable standards, and promote best practices with consistent application. Strengthening Forensic Science in the United States: A Path Forward provides a detailed plan for addressing these needs and suggests the creation of a new government entity, the National Institute of Forensic Science, to establish and enforce standards within the forensic science community. The benefits of improving and regulating the forensic science disciplines are clear: assisting law enforcement officials, enhancing homeland security, and reducing the risk of wrongful conviction and exoneration. Strengthening Forensic Science in the United States gives a full account of what is needed to advance the forensic science disciplines, including upgrading of systems and organizational structures, better training, widespread adoption of uniform and enforceable best practices, and mandatory certification and accreditation programs. While this book provides an essential call-to-action for congress and policy makers, it also serves as a vital tool for law enforcement agencies, criminal prosecutors and attorneys, and forensic science educators.*

ARTIFICIAL COMPUTATION IN BIOLOGY AND MEDICINE

INTERNATIONAL WORK-CONFERENCE ON THE INTERPLAY BETWEEN NATURAL AND ARTIFICIAL COMPUTATION, IWINAC 2015, ELCHE, SPAIN, JUNE 1-5, 2015, PROCEEDINGS, PART I

Springer *The two volumes LNCS 9107 and 9108 constitute the proceedings of the International Work-Conference on the Interplay Between Natural and Artificial Computation, IWINAC 2015, held in Elche, Spain, in June 2015. The total of 103 contributions was carefully reviewed and selected from 190 submissions during two rounds of reviewing and improvement. The papers are organized in two volumes, one on artificial computation and biology and medicine, addressing topics such as computational neuroscience, neural coding and neuro-informatics, as well as computational foundations and approaches to the study of cognition. The second volume deals with bioinspired computation in artificial systems; topics alluded are bio-inspired circuits and mechanisms, bioinspired programming strategies and bioinspired engineering AI&KE.*

DEEP LEARNING ON GRAPHS

Cambridge University Press *A comprehensive text on foundations and techniques of graph neural networks with applications in NLP, data mining, vision and healthcare.*

ADVANCES IN DIGITAL FORENSICS VII

7TH IFIP WG 11.9 INTERNATIONAL CONFERENCE ON DIGITAL FORENSICS, ORLANDO, FL, USA, JANUARY 31 - FEBRUARY 2, 2011, REVISED SELECTED PAPERS

Springer Science & Business Media *Digital forensics deals with the acquisition, preservation, examination, analysis and presentation of electronic evidence. Networked computing, wireless communications and portable electronic devices have expanded the role of digital forensics beyond traditional computer crime investigations. Practically every crime now involves some aspect of digital evidence; digital forensics provides the techniques and tools to articulate this evidence. Digital forensics also has myriad intelligence applications. Furthermore, it has a vital role in information assurance -- investigations of security breaches yield valuable information that can be used to design more secure systems. Advances in Digital Forensics VII describes original research results and innovative applications in the discipline of digital forensics. In addition, it highlights some of the major technical and legal issues related to digital evidence and electronic crime investigations. The areas of coverage include: Themes and Issues, Forensic Techniques, Fraud and Malware Investigations, Network Forensics, and Advanced Forensic Techniques. This book is the 7th volume in the annual series produced by the International Federation for Information Processing (IFIP) Working Group 11.9 on Digital Forensics, an international community of scientists, engineers and practitioners dedicated to advancing the state of the art of research and practice in digital forensics. The book contains a selection of 21 edited papers from the 7th Annual IFIP WG 11.9 International Conference on Digital Forensics, held at the National Center for Forensic Science, Orlando, Florida, USA in the spring of 2011. Advances in Digital Forensics VII is an important resource for researchers, faculty members and graduate students, as well as for practitioners and individuals engaged in research and development efforts for the law enforcement and intelligence communities. Gilbert Peterson is an Associate Professor of Computer Engineering at the Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio, USA. Sujeet Shenoi is the F.P. Walter Professor of Computer Science at the University of Tulsa, Tulsa, Oklahoma, USA.*

BIG-DATA-ANALYTICS IN ASTRONOMY, SCIENCE, AND ENGINEERING

9TH INTERNATIONAL CONFERENCE ON BIG DATA ANALYTICS, BDA 2021, VIRTUAL EVENT, DECEMBER 7–9, 2021, PROCEEDINGS

Springer Nature

HANDBOOK OF RESEARCH ON COMPUTATIONAL INTELLIGENCE FOR ENGINEERING, SCIENCE, AND BUSINESS

IGI Global *Using the same strategy for the needs of image processing and pattern recognition, scientists and researchers have turned to computational intelligence for better research throughputs and end results applied towards engineering, science, business and financial applications. Handbook of Research on Computational Intelligence for Engineering, Science, and Business discusses the*

computation intelligence approaches, initiatives and applications in the engineering, science and business fields. This reference aims to highlight computational intelligence as no longer limited to computing-related disciplines and can be applied to any effort which handles complex and meaningful information.

DEEP LEARNING WITH PYTHON

Simon and Schuster *Summary Deep Learning with Python introduces the field of deep learning using the Python language and the powerful Keras library. Written by Keras creator and Google AI researcher François Chollet, this book builds your understanding through intuitive explanations and practical examples. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Machine learning has made remarkable progress in recent years. We went from near-unusable speech and image recognition, to near-human accuracy. We went from machines that couldn't beat a serious Go player, to defeating a world champion. Behind this progress is deep learning—a combination of engineering advances, best practices, and theory that enables a wealth of previously impossible smart applications. About the Book Deep Learning with Python introduces the field of deep learning using the Python language and the powerful Keras library. Written by Keras creator and Google AI researcher François Chollet, this book builds your understanding through intuitive explanations and practical examples. You'll explore challenging concepts and practice with applications in computer vision, natural-language processing, and generative models. By the time you finish, you'll have the knowledge and hands-on skills to apply deep learning in your own projects. What's Inside Deep learning from first principles Setting up your own deep-learning environment Image-classification models Deep learning for text and sequences Neural style transfer, text generation, and image generation About the Reader Readers need intermediate Python skills. No previous experience with Keras, TensorFlow, or machine learning is required. About the Author François Chollet works on deep learning at Google in Mountain View, CA. He is the creator of the Keras deep-learning library, as well as a contributor to the TensorFlow machine-learning framework. He also does deep-learning research, with a focus on computer vision and the application of machine learning to formal reasoning. His papers have been published at major conferences in the field, including the Conference on Computer Vision and Pattern Recognition (CVPR), the Conference and Workshop on Neural Information Processing Systems (NIPS), the International Conference on Learning Representations (ICLR), and others. Table of Contents PART 1 - FUNDAMENTALS OF DEEP LEARNING What is deep learning? Before we begin: the mathematical building blocks of neural networks Getting started with neural networks Fundamentals of machine learning PART 2 - DEEP LEARNING IN PRACTICE Deep learning for computer vision Deep learning for text and sequences Advanced deep-learning best practices Generative deep learning Conclusions appendix A - Installing Keras and its dependencies on Ubuntu appendix B - Running Jupyter notebooks on an EC2 GPU instance*

PROBABILISTIC MACHINE LEARNING

AN INTRODUCTION

MIT Press *A detailed and up-to-date introduction to machine learning, presented through the unifying lens of probabilistic modeling and Bayesian decision theory. This book offers a detailed and up-to-date introduction to machine learning (including deep learning) through the unifying lens of probabilistic modeling and Bayesian decision theory. The book covers mathematical background (including linear algebra and optimization), basic supervised learning (including linear and logistic regression and deep neural networks), as well as more advanced topics (including transfer learning and unsupervised learning). End-of-chapter exercises allow students to apply what they have learned, and an appendix covers notation. Probabilistic Machine Learning grew out of the author's 2012 book, Machine Learning: A Probabilistic Perspective. More than just a simple update, this is a completely new book that reflects the dramatic developments in the field since 2012, most notably deep learning. In addition, the new book is accompanied by online Python code, using libraries such as scikit-learn, JAX, PyTorch, and Tensorflow, which can be used to reproduce nearly all the figures; this code can be run inside a web browser using cloud-based notebooks, and provides a practical complement to the theoretical topics discussed in the book. This introductory text will be followed by a sequel that covers more advanced topics, taking the same probabilistic approach.*

SYSTEMS AND SOFTWARE DEVELOPMENT, MODELING, AND ANALYSIS: NEW PERSPECTIVES AND METHODOLOGIES

NEW PERSPECTIVES AND METHODOLOGIES

IGI Global *In the digital age, technological solutions are being developed and integrated into every aspect of our everyday lives. The ever-changing scope of research in systems and software advancements allows for further improvements and applications. Systems and Software Development, Modeling, and Analysis: New Perspectives and Methodologies presents diverse, interdisciplinary research on topics pertaining to the management, integration, evaluation, and architecture of modern computational systems and software. Presenting the most up-to-date research in this rapidly evolving field, this title is ideally designed for use by computer engineers, academicians, graduate and post-graduate students, and computer science researchers.*

ARTIFICIAL INTELLIGENCE WITH PYTHON

Packt Publishing Ltd *Build real-world Artificial Intelligence applications with Python to intelligently interact with the world around you About This Book Step into the amazing world of intelligent apps using this comprehensive guide Enter the world of Artificial Intelligence, explore it, and create your own applications Work through simple yet insightful examples that will get you up and running with Artificial Intelligence in no time Who This Book Is For This book is for Python developers who want to 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. It will also be useful for experienced Python programmers who are looking to use Artificial Intelligence techniques in their existing technology stacks. What You Will Learn Realize different classification and regression techniques Understand the concept of*

clustering and how to use it to automatically segment data See how to build an intelligent recommender system Understand logic programming and how to use it Build automatic speech recognition systems Understand the basics of heuristic search and genetic programming Develop games using Artificial Intelligence Learn how reinforcement learning works Discover how to build intelligent applications centered on images, text, and time series data See how to use deep learning algorithms and build applications based on it In Detail Artificial Intelligence is becoming increasingly relevant in the modern world where everything is driven by technology and data. It is used extensively across many fields such as search engines, image recognition, robotics, finance, and so on. We will explore various real-world scenarios in this book and you'll learn about various algorithms that can be used to build Artificial Intelligence applications. During the course of this book, you will find out how to make informed decisions about what algorithms to use in a given context. Starting from the basics of Artificial Intelligence, you will learn how to develop various building blocks using different data mining techniques. You will see how to implement different algorithms to get the best possible results, and will understand how to apply them to real-world scenarios. If you want to add an intelligence layer to any application that's based on images, text, stock market, or some other form of data, this exciting book on Artificial Intelligence will definitely be your guide! Style and approach This highly practical book will show you how to implement Artificial Intelligence. The book provides multiple examples enabling you to create smart applications to meet the needs of your organization. In every chapter, we explain an algorithm, implement it, and then build a smart application.

AI AND BIG DATA'S POTENTIAL FOR DISRUPTIVE INNOVATION

IGI Global *Big data and artificial intelligence (AI) are at the forefront of technological advances that represent a potential transformational mega-trend—a new multipolar and innovative disruption. These technologies, and their associated management paradigm, are already rapidly impacting many industries and occupations, but in some sectors, the change is just beginning. Innovating ahead of emerging technologies is the new imperative for any organization that aspires to succeed in the next decade. Faced with the power of this AI movement, it is imperative to understand the dynamics and new codes required by the disruption and to adapt accordingly. AI and Big Data's Potential for Disruptive Innovation provides emerging research exploring the theoretical and practical aspects of successfully implementing new and innovative technologies in a variety of sectors including business, transportation, and healthcare. Featuring coverage on a broad range of topics such as semantic mapping, ethics in AI, and big data governance, this book is ideally designed for IT specialists, industry professionals, managers, executives, researchers, scientists, and engineers seeking current research on the production of new and innovative mechanization and its disruptions.*

NEURAL NETWORKS FOR PATTERN RECOGNITION

Oxford University Press `*Readers will emerge with a rigorous statistical grounding in the theory of how to construct and train neural networks in pattern recognition' New Scientist*

REINFORCEMENT LEARNING, SECOND EDITION

AN INTRODUCTION

MIT Press *The significantly expanded and updated new edition of a widely used text on reinforcement learning, one of the most active research areas in artificial intelligence. Reinforcement learning, one of the most active research areas in artificial intelligence, is a computational approach to learning whereby an agent tries to maximize the total amount of reward it receives while interacting with a complex, uncertain environment. In Reinforcement Learning, Richard Sutton and Andrew Barto provide a clear and simple account of the field's key ideas and algorithms. This second edition has been significantly expanded and updated, presenting new topics and updating coverage of other topics. Like the first edition, this second edition focuses on core online learning algorithms, with the more mathematical material set off in shaded boxes. Part I covers as much of reinforcement learning as possible without going beyond the tabular case for which exact solutions can be found. Many algorithms presented in this part are new to the second edition, including UCB, Expected Sarsa, and Double Learning. Part II extends these ideas to function approximation, with new sections on such topics as artificial neural networks and the Fourier basis, and offers expanded treatment of off-policy learning and policy-gradient methods. Part III has new chapters on reinforcement learning's relationships to psychology and neuroscience, as well as an updated case-studies chapter including AlphaGo and AlphaGo Zero, Atari game playing, and IBM Watson's wagering strategy. The final chapter discusses the future societal impacts of reinforcement learning.*

ARTIFICIAL INTELLIGENCE XXXVI

39TH SGAI INTERNATIONAL CONFERENCE ON ARTIFICIAL INTELLIGENCE, AI 2019, CAMBRIDGE, UK, DECEMBER 17–19, 2019, PROCEEDINGS

Springer Nature *This book constitutes the proceedings of the 39th SGAI International Conference on Innovative Techniques and Applications of Artificial Intelligence, AI 2019, held in Cambridge, UK, in December 2019. The 29 full papers and 14 short papers presented in this volume were carefully reviewed and selected from 49 submissions. The volume includes technical papers presenting new and innovative developments in the field as well as application papers presenting innovative applications of AI techniques in a number of subject domains. The papers are organized in the following topical sections: machine learning; knowledge discovery and data mining; agents, knowledge acquisition and ontologies; medical applications; applications of evolutionary algorithms; machine learning for time series data; applications of machine learning; and knowledge acquisition.*

JULIA FOR DATA SCIENCE

Technics Publications *Master how to use the Julia language to solve business critical data science challenges. After covering the importance of Julia to the data science community and several essential data science principles, we start with the basics including how*

to install Julia and its powerful libraries. Many examples are provided as we illustrate how to leverage each Julia command, dataset, and function. Specialized script packages are introduced and described. Hands-on problems representative of those commonly encountered throughout the data science pipeline are provided, and we guide you in the use of Julia in solving them using published datasets. Many of these scenarios make use of existing packages and built-in functions, as we cover: 1. 1. An overview of the data science pipeline along with an example illustrating the key points, implemented in Julia 2. 2. Options for Julia IDEs 3. 3. Programming structures and functions 4. 4. Engineering tasks, such as importing, cleaning, formatting and storing data, as well as performing data preprocessing 5. 5. Data visualization and some simple yet powerful statistics for data exploration purposes 6. 6. Dimensionality reduction and feature evaluation 7. 7. Machine learning methods, ranging from unsupervised (different types of clustering) to supervised ones (decision trees, random forests, basic neural networks, regression trees, and Extreme Learning Machines) 8. 8. Graph analysis including pinpointing the connections among the various entities and how they can be mined for useful insights. Each chapter concludes with a series of questions and exercises to reinforce what you learned. The last chapter of the book will guide you in creating a data science application from scratch using Julia.

THE BRAIN IN SEARCH OF ITSELF

SANTIAGO RAMÓN Y CAJAL AND THE STORY OF THE NEURON

Farrar, Straus and Giroux *"Passionate and meticulous . . . [Ehrlich] delivers thought-provoking metaphors, unforgettable scenes and many beautifully worded phrases." —Benjamin Labatut, The New York Times Book Review The first major biography of the Nobel Prize–winning scientist who discovered neurons and transformed our understanding of the human mind—illustrated with his extraordinary anatomical drawings Unless you're a neuroscientist, Santiago Ramón y Cajal is likely the most important figure in the history of biology you've never heard of. Along with Charles Darwin and Louis Pasteur, he ranks among the most brilliant and original biologists of the nineteenth century, and his discoveries have done for our understanding of the human brain what the work of Galileo and Sir Isaac Newton did for our conception of the physical universe. He was awarded the Nobel Prize in 1906 for his lifelong investigation of the structure of neurons: "The mysterious butterflies of the soul," Cajal called them, "whose beating of wings may one day reveal to us the secrets of the mind." And he produced a dazzling oeuvre of anatomical drawings, whose alien beauty grace the pages of medical textbooks and the walls of museums to this day. Benjamin Ehrlich's The Brain in Search of Itself is the first major biography in English of this singular figure, whose scientific odyssey mirrored the rocky journey of his beloved homeland of Spain into the twentieth century. Born into relative poverty in a mountaintop hamlet, Cajal was an enterprising and unruly child whose ambitions were both nurtured and thwarted by his father, a country doctor with a flinty disposition. A portrait of a nation as well a biography, The Brain in Search of Itself follows Cajal from the hinterlands to Barcelona and Madrid, where he became an illustrious figure—resisting and ultimately transforming the rigid hierarchies and underdeveloped science that surrounded him. To momentous effect, Cajal devised a theory that was as controversial in his own time as it is universal in ours: that the nervous system is comprised of individual cells with distinctive roles, just like any other organ in the body. In one of the greatest scientific rivalries in history, he argued his case against Camillo Golgi and prevailed. In our age of neuro-imaging and investigations into the neural basis of the mind, Cajal is the artistic and scientific forefather we must get to know. The Brain in Search of Itself is at once the story of how the brain as we know it came into being and a finely wrought portrait of an individual as fantastical and complex as the subject to which he devoted his life.*

HANDS-ON MACHINE LEARNING WITH SCIKIT-LEARN, KERAS, AND TENSORFLOW

CONCEPTS, TOOLS, AND TECHNIQUES TO BUILD INTELLIGENT SYSTEMS

O'Reilly Media *Through a series of recent breakthroughs, deep learning has boosted the entire field of machine learning. Now, even programmers who know close to nothing about this technology can use simple, efficient tools to implement programs capable of learning from data. This practical book shows you how. By using concrete examples, minimal theory, and two production-ready Python frameworks—Scikit-Learn and TensorFlow—author Aurélien Géron helps you gain an intuitive understanding of the concepts and tools for building intelligent systems. You'll learn a range of techniques, starting with simple linear regression and progressing to deep neural networks. With exercises in each chapter to help you apply what you've learned, all you need is programming experience to get started. Explore the machine learning landscape, particularly neural nets Use Scikit-Learn to track an example machine-learning project end-to-end Explore several training models, including support vector machines, decision trees, random forests, and ensemble methods Use the TensorFlow library to build and train neural nets Dive into neural net architectures, including convolutional nets, recurrent nets, and deep reinforcement learning Learn techniques for training and scaling deep neural nets*

THE SCIENCES OF THE ARTIFICIAL, THIRD EDITION

MIT Press *Continuing his exploration of the organization of complexity and the science of design, this new edition of Herbert Simon's classic work on artificial intelligence adds a chapter that sorts out the current themes and tools—chaos, adaptive systems, genetic algorithms—for analyzing complexity and complex systems. There are updates throughout the book as well. These take into account important advances in cognitive psychology and the science of design while confirming and extending the book's basic thesis: that a physical symbol system has the necessary and sufficient means for intelligent action. The chapter "Economic Reality" has also been revised to reflect a change in emphasis in Simon's thinking about the respective roles of organizations and markets in economic systems.*

TOTAL ENGAGEMENT

HOW GAMES AND VIRTUAL WORLDS ARE CHANGING THE WAY PEOPLE WORK AND BUSINESSES COMPETE

Harvard Business Press *Can the workplace be more productive by including avatars, three-dimensional environments, and participant-driven outcomes? This grounded and thought-provoking book by Byron Reeves and Leighton Read proves that it is not only*

possible, it is inevitable. Implementing components of multiplayer computer games in the workplace will address a host of age-old problems. Games can not only stem boredom and decrease turnover, but also enhancee collaboration and encourage creative leadership. Games require extraordinary teamwork, elaborate data analysis and strategy, recruitment and retention of top players, and quick decision making. Recreating some elements of games - such as positioning tasks within stories, creating internal economies, and implementing participant-driven communication systems - can not only boost employee engagement but overall productivity. Of course, the strong psychological power of games can have both positive and negative consequences for the workplace. That's why it's important to put them into practice correctly from the beginning - and Reeves and Read explain how by showing which good design principles are a powerful antidote to the addictive and stress-inducing potential of games. Supported by specific case studies and years of research, Total Engagement will completely change the way you view both work and play.

ARTIFICIAL INTELLIGENCE IN NEUROSCIENCE: AFFECTIVE ANALYSIS AND HEALTH APPLICATIONS

9TH INTERNATIONAL WORK-CONFERENCE ON THE INTERPLAY BETWEEN NATURAL AND ARTIFICIAL COMPUTATION, IWINAC 2022, PUERTO DE LA CRUZ, TENERIFE, SPAIN, MAY 31 – JUNE 3, 2022, PROCEEDINGS, PART I

Springer Nature *The two volume set LNCS 13258 and 13259 constitutes the proceedings of the International Work-Conference on the Interplay Between Natural and Artificial Computation, IWINAC 2022, held in Puerto de la Cruz, Tenerife, Spain in May – June 2022. The total of 121 contributions was carefully reviewed and selected from 203 submissions. The papers are organized in two volumes, with the following topical sub-headings: Part I: Machine Learning in Neuroscience; Neuromotor and Cognitive Disorders; Affective Analysis; Health Applications, Part II: Affective Computing in Ambient Intelligence; Bioinspired Computing Approaches; Machine Learning in Computer Vision and Robot; Deep Learning; Artificial Intelligence Applications.*

INCLUSIVE EARLY CHILDHOOD EDUCATION: DEVELOPMENT, RESOURCES, AND PRACTICE

Cengage Learning *INCLUSIVE EARLY CHILDHOOD EDUCATION: DEVELOPMENT, RESOURCES, AND PRACTICE, Sixth Edition, is a comprehensive special education resource book that provides essential information on a variety of early childhood learning disabilities, as well as strategies for including children with these special needs in regular educational settings. The author provides students with a solid grounding in theory and research, as well as practical guidelines, real-world vignettes, and hands-on program planning assistance to prepare them to integrate children with learning disabilities into their classrooms. Updated throughout, this edition also introduces videos that are available for viewing at the Early Childhood Education Media Library, allowing students to see text concepts brought to life in real classroom settings. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.*

SCIENCE AND TECHNOLOGIES FOR SMART CITIES

5TH EAI INTERNATIONAL SUMMIT, SMARTCITY360, BRAGA, PORTUGAL, DECEMBER 4-6, 2019, PROCEEDINGS

Springer Nature *This book constitutes the refereed proceedings of the 5th Annual Smart City 360° Summit, held in Braga, Portugal, in December 2019. The volume combines selected papers of four conferences, namely IoT in Urban Space, Urb-IoT 2019, Smart Governance for Sustainable Smart Cities, SmartGov 2019, Sensor Systems and Software, S-Cube 2019, and Intelligent Technologies for Interactive Entertainment, Intetain 2019. The 5 keynote and 32 conference papers presented were carefully reviewed and selected from 113 submissions and present results of multidisciplinary scientific and industry collaboration to solve complex societal, technological and economic problems Smart Cities. As such, the main goals are to promote quality of life, work conditions, mobility and sustainability.*

COMMUNICATION AND INTELLIGENT SYSTEMS

PROCEEDINGS OF ICCIS 2020

Springer Nature *This book gathers selected research papers presented at the International Conference on Communication and Intelligent Systems (ICCIS 2020), organized jointly by Birla Institute of Applied Sciences, Uttarakhand, and Soft Computing Research Society during 26–27 December 2020. This book presents a collection of state-of-the-art research work involving cutting-edge technologies for communication and intelligent systems. Over the past few years, advances in artificial intelligence and machine learning have sparked new research efforts around the globe, which explore novel ways of developing intelligent systems and smart communication technologies. The book presents single- and multi-disciplinary research on these themes in order to make the latest results available in a single, readily accessible source.*

APPLIED BIOMEDICAL ENGINEERING USING ARTIFICIAL INTELLIGENCE AND COGNITIVE MODELS

Elsevier *Applied Biomedical Engineering Using Artificial Intelligence and Cognitive Models focuses on the relationship between three different multidisciplinary branches of engineering: Biomedical Engineering, Cognitive Science and Computer Science through Artificial Intelligence models. These models will be used to study how the nervous system and musculoskeletal system obey movement orders from the brain, as well as the mental processes of the information during cognition when injuries and neurologic diseases are present in the human body. The interaction between these three areas are studied in this book with the objective of obtaining AI models on injuries and neurologic diseases of the human body, studying diseases of the brain, spine and the nerves that connect them with the musculoskeletal system. There are more than 600 diseases of the nervous system, including brain tumors, epilepsy, Parkinson's disease, stroke, and many others. These diseases affect the human cognitive system that sends orders from the central nervous system (CNS) through the peripheral nervous systems (PNS) to do tasks using the musculoskeletal system. These actions can be*

detected by many Bioinstruments (Biomedical Instruments) and cognitive device data, allowing us to apply AI using Machine Learning-Deep Learning-Cognitive Computing models through algorithms to analyze, detect, classify, and forecast the process of various illnesses, diseases, and injuries of the human body. Applied Biomedical Engineering Using Artificial Intelligence and Cognitive Models provides readers with the study of injuries, illness, and neurological diseases of the human body through Artificial Intelligence using Machine Learning (ML), Deep Learning (DL) and Cognitive Computing (CC) models based on algorithms developed with MATLAB® and IBM Watson®. Provides an introduction to Cognitive science, cognitive computing and human cognitive relation to help in the solution of AI Biomedical engineering problems Explain different Artificial Intelligence (AI) including evolutionary algorithms to emulate natural evolution, reinforced learning, Artificial Neural Network (ANN) type and cognitive learning and to obtain many AI models for Biomedical Engineering problems Includes coverage of the evolution Artificial Intelligence through Machine Learning (ML), Deep Learning (DL), Cognitive Computing (CC) using MATLAB® as a programming language with many add-on MATLAB® toolboxes, and AI based commercial products cloud services as: IBM (Cognitive Computing, IBM Watson®, IBM Watson Studio®, IBM Watson Studio Visual Recognition®), and others Provides the necessary tools to accelerate obtaining results for the analysis of injuries, illness, and neurologic diseases that can be detected through the static, kinetics and kinematics, and natural body language data and medical imaging techniques applying AI using ML-DL-CC algorithms with the objective of obtaining appropriate conclusions to create solutions that improve the quality of life of patients

INTRODUCTION TO GRAPH NEURAL NETWORKS

Morgan & Claypool Publishers *Graphs are useful data structures in complex real-life applications such as modeling physical systems, learning molecular fingerprints, controlling traffic networks, and recommending friends in social networks. However, these tasks require dealing with non-Euclidean graph data that contains rich relational information between elements and cannot be well handled by traditional deep learning models (e.g., convolutional neural networks (CNNs) or recurrent neural networks (RNNs)). Nodes in graphs usually contain useful feature information that cannot be well addressed in most unsupervised representation learning methods (e.g., network embedding methods). Graph neural networks (GNNs) are proposed to combine the feature information and the graph structure to learn better representations on graphs via feature propagation and aggregation. Due to its convincing performance and high interpretability, GNN has recently become a widely applied graph analysis tool. This book provides a comprehensive introduction to the basic concepts, models, and applications of graph neural networks. It starts with the introduction of the vanilla GNN model. Then several variants of the vanilla model are introduced such as graph convolutional networks, graph recurrent networks, graph attention networks, graph residual networks, and several general frameworks. Variants for different graph types and advanced training methods are also included. As for the applications of GNNs, the book categorizes them into structural, non-structural, and other scenarios, and then it introduces several typical models on solving these tasks. Finally, the closing chapters provide GNN open resources and the outlook of several future directions.*

PARALLEL PROBLEM SOLVING FROM NATURE - PPSN IX

9TH INTERNATIONAL CONFERENCE, REYKJAVIK, ICELAND, SEPTEMBER 9-13, 2006, PROCEEDINGS

Springer *This book constitutes the refereed proceedings of the 9th International Conference on Parallel Problem Solving from Nature, PPSN 2006. The book presents 106 revised full papers covering a wide range of topics, from evolutionary computation to swarm intelligence and bio-inspired computing to real-world applications. These are organized in topical sections on theory, new algorithms, applications, multi-objective optimization, evolutionary learning, as well as representations, operators, and empirical evaluation.*

GENERATIVE ADVERSARIAL LEARNING: ARCHITECTURES AND APPLICATIONS

Springer Nature *This book provides a collection of recent research works addressing theoretical issues on improving the learning process and the generalization of GANs as well as state-of-the-art applications of GANs to various domains of real life. Adversarial learning fascinates the attention of machine learning communities across the world in recent years. Generative adversarial networks (GANs), as the main method of adversarial learning, achieve great success and popularity by exploiting a minimax learning concept, in which two networks compete with each other during the learning process. Their key capability is to generate new data and replicate available data distributions, which are needed in many practical applications, particularly in computer vision and signal processing. The book is intended for academics, practitioners, and research students in artificial intelligence looking to stay up to date with the latest advancements on GANs' theoretical developments and their applications.*

COMPUTER INFORMATION SYSTEMS AND INDUSTRIAL MANAGEMENT

17TH INTERNATIONAL CONFERENCE, CISIM 2018, OLOMOUC, CZECH REPUBLIC, SEPTEMBER 27-29, 2018, PROCEEDINGS

Springer *This book constitutes the proceedings of the 17th International Conference on Computer Information Systems and Industrial Management Applications, CISIM 2018, held in Olomouc, Czech Republic, in September 2018. The 42 full papers presented together with 4 keynotes were carefully reviewed and selected from 69 submissions. The main topics covered by the chapters in this book are biometrics, security systems, multimedia, classification and clustering, and industrial management. Besides these, the reader will find interesting papers on computer information systems as applied to wireless networks, computer graphics, and intelligent systems. The papers are organized in the following topical sections: biometrics and pattern recognition applications; computer information systems; industrial management and other applications; machine learning and high performance computing; modelling and optimization; and various aspects of computer security.*

PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON BIG DATA, IOT, AND MACHINE LEARNING

BIM 2021

Springer Nature

A THEORY OF LEARNING AND GENERALIZATION

WITH APPLICATIONS TO NEURAL NETWORKS AND CONTROL SYSTEMS

Springer *A Theory of Learning and Generalization provides a formal mathematical theory for addressing intuitive questions of the type: How does a machine learn a new concept on the basis of examples? How can a neural network, after sufficient training, correctly predict the output of a previously unseen input? How much training is required to achieve a specified level of accuracy in the prediction? How can one "identify" the dynamical behaviour of a nonlinear control system by observing its input-output behaviour over a finite interval of time? This is the first book to treat the problem of machine learning in conjunction with the theory of empirical processes, the latter being a well-established branch of probability theory. The treatment of both topics side by side leads to new insights, as well as new results in both topics. An extensive references section and open problems will help readers to develop their own work in the field.*

THE HANDBOOK OF BRAIN THEORY AND NEURAL NETWORKS

MIT Press (MA) *Choice Outstanding Academic Title, 1996. In hundreds of articles by experts from around the world, and in overviews and "road maps" prepared by the editor, The Handbook of Brain Theory and Neural Networks charts the immense progress made in recent years in many specific areas related to great questions: How does the brain work? How can we build intelligent machines? While many books discuss limited aspects of one subfield or another of brain theory and neural networks, the Handbook covers the entire sweep of topics—from detailed models of single neurons, analyses of a wide variety of biological neural networks, and connectionist studies of psychology and language, to mathematical analyses of a variety of abstract neural networks, and technological applications of adaptive, artificial neural networks. Expository material makes the book accessible to readers with varied backgrounds while still offering a clear view of the recent, specialized research on specific topics.*

FLEXIBLE QUERY ANSWERING SYSTEMS

14TH INTERNATIONAL CONFERENCE, FQAS 2021, BRATISLAVA, SLOVAKIA, SEPTEMBER 19–24, 2021, PROCEEDINGS

Springer Nature *This book constitutes the refereed proceedings of the 14th International Conference on Flexible Query Answering Systems, FQAS 2021, held virtually and in Bratislava, Slovakia, in September 2021. The 16 full papers and 1 perspective papers presented were carefully reviewed and selected from 17 submissions. They are organized in the following topical sections: model-based flexible query answering approaches and data-driven approaches.*