

Advances In Machine Learning Ii Dedicated To The Memory Of Professor Ryszard S Michalski Studies In Computational Intelligence

Machine Learning in Cardiovascular Medicine addresses the ever-expanding applications of artificial intelligence (AI), specifically machine learning (ML), in healthcare and within cardiovascular medicine. The book focuses on emphasizing ML for biomedical applications and provides a comprehensive summary of the past and present of AI, basics of ML, and clinical applications of ML within cardiovascular medicine for predictive analytics and precision medicine. It helps readers understand how ML works along with its limitations and strengths, such that they can harness its computational power to streamline workflow and improve patient care. It is suitable for both clinicians and engineers; providing a template for clinicians to understand areas of application of machine learning within cardiovascular research; and assist computer scientists and engineers in evaluating current and future impact of machine learning on cardiovascular medicine. Provides an overview of machine learning, both for a clinical and engineering audience Summarize recent advances in both cardiovascular medicine and artificial intelligence Discusses the advantages of using machine learning for outcomes research and image processing Addresses the ever-expanding application of this novel technology and discusses some of the unique challenges associated with such an approach

Artificial intelligence and its various components are rapidly engulfing almost every professional industry. Specific features of AI that have proven to be vital solutions to numerous real-world issues are machine learning and deep learning. These intelligent agents unlock higher levels of performance and efficiency, creating a wide span of industrial applications. However, there is a lack of research on the specific uses of machine/deep learning in the professional realm. Machine Learning and Deep Learning in Real-Time Applications provides emerging research exploring the theoretical and practical aspects of machine learning and deep learning and their implementations as well as their ability to solve real-world problems within several professional disciplines including healthcare, business, and computer science. Featuring coverage on a broad range of topics such as image processing, medical improvements, and smart grids, this book is ideally designed for researchers, academicians, scientists, industry experts, scholars, IT professionals, engineers, and students seeking current research on the multifaceted uses and implementations of machine learning and deep learning across the globe.

In the digital age, the field of machine learning has lived up to its promise of learning from and leveraging data in diverse fields, creating knowledge and driving decisions. This book intends to detail advances in the state-of-the-art in machine learning, one of the fastest emerging fields in the industry and one of the most popular fields of research in computational sciences. The roots of machine learning methods can be traced back to both statistics and computer science. Its story continues to evolve and the future is set to be greatly influenced through MLs contributions to the human knowledge-base as well as the economic engine. Applied machine learning research enthuses the masses with applications such as video games that interact through a camera, self-driving cars, etc. At the same time, more basic machine learning research holds the potential to impact knowledge elicitation, learning, predictions, decisions, and optimizations in fields ranging from environmental/biomedical/clinical informatics on one hand to online retail and search on the other. Accordingly, the contents of this volume are geared to present a full-color palette consisting of improved optimization algorithms, novel ANN design architectures, along with customized methods for mining an environmental dataset, pattern recognition in images, and for improved document and text search. While many out-of-the-box implementations of machine learning algorithms are currently available, customized methods developed by honed and innovative researchers continue to provide significant improvements in various contexts. Advancements through basic research continue to break the barriers of the extent of MLs contribution to the world.

Hardware Accelerator Systems for Artificial Intelligence and Machine Learning, Volume 122 delves into artificial Intelligence and the growth it has seen with the advent of Deep Neural Networks (DNNs) and Machine Learning. Updates in this release include chapters on Hardware accelerator systems for artificial intelligence and machine learning, Introduction to Hardware Accelerator Systems for Artificial Intelligence and Machine Learning, Deep Learning with GPUs, Edge Computing Optimization of Deep Learning Models for Specialized Tensor Processing Architectures, Architecture of NPU for DNN, Hardware Architecture for Convolutional Neural Network for Image Processing, FPGA based Neural Network Accelerators, and much more. Updates on new information on the architecture of GPU, NPU and DNN Discusses In-memory computing, Machine intelligence and Quantum computing Includes sections on Hardware Accelerator Systems to improve processing efficiency and performance

Create AI applications in Python and lay the foundations for your career in data science Key Features Practical examples that explain key machine learning algorithms Explore neural networks in detail with interesting examples Master core AI concepts with engaging activities Book Description Machine learning and neural networks are pillars on which you can build intelligent applications. Artificial Intelligence and Machine Learning Fundamentals begins by introducing you to Python and discussing AI search algorithms. You will cover in-depth mathematical topics, such as regression and classification, illustrated by Python examples. As you make your way through the book, you will progress to advanced AI techniques and concepts, and work on real-life datasets to form decision trees and clusters. You will be introduced to neural networks, a powerful tool based on Moore's law. By the end of this book, you will be confident when it comes to building your own AI applications with your newly acquired skills! What you will learn Understand the importance, principles, and fields of AI Implement basic artificial intelligence concepts with Python Apply regression and classification concepts to real-world problems Perform predictive analysis using decision trees and random forests Carry out clustering using the k-means and mean shift algorithms Understand the fundamentals of deep learning via practical examples Who this book is for Artificial Intelligence and Machine Learning Fundamentals is for software developers and data scientists

who want to enrich their projects with machine learning. You do not need any prior experience in AI. However, it's recommended that you have knowledge of high school-level mathematics and at least one programming language (preferably Python).

Now in its second edition, this book focuses on practical algorithms for mining data from even the largest datasets. The purpose of this book is to provide an up-to-date and systematic introduction to the principles and algorithms of machine learning. The definition of learning is broad enough to include most tasks that we commonly call "learning" tasks, as we use the word in daily life. It is also broad enough to encompass computers that improve from experience in quite straightforward ways. The book will be of interest to industrial engineers and scientists as well as academics who wish to pursue machine learning. The book is intended for both graduate and postgraduate students in fields such as computer science, cybernetics, system sciences, engineering, statistics, and social sciences, and as a reference for software professionals and practitioners. The wide scope of the book provides a good introduction to many approaches of machine learning, and it is also the source of useful bibliographical information.

This book introduces readers to both basic and advanced concepts in deep network models. It covers state-of-the-art deep architectures that many researchers are currently using to overcome the limitations of the traditional artificial neural networks. Various deep architecture models and their components are discussed in detail, and subsequently illustrated by algorithms and selected applications. In addition, the book explains in detail the transfer learning approach for faster training of deep models; the approach is also demonstrated on large volumes of fingerprint and face image datasets. In closing, it discusses the unique set of problems and challenges associated with these models.

This book comprises high-quality refereed research papers presented at The Second International Symposium on Computer Science, Digital Economy and Intelligent Systems (CSDEIS2020), held in Moscow, Russia, on December 18-20, 2020, organized jointly by Moscow State Technical University and the International Research Association of Modern Education and Computer Science. The topics discussed in the book include state-of-the-art papers in computer science and their technological applications; intelligent systems and intellectual approaches; digital economics and methodological approaches. It is an excellent source of references for researchers, graduate students, engineers, management practitioners, and undergraduate students interested in computer science and their applications in engineering and management.

Professor Richard S. Michalski passed away on September 20, 2007. Once we learned about his untimely death we immediately realized that we would no longer have with us a truly exceptional scholar and researcher who for several decades had been influencing the work of numerous scientists all over the world - not only in his area of expertise, notably machine learning, but also in the broadly understood areas of data analysis, data mining, knowledge discovery and many others. In fact, his influence was even much broader due to his creative vision, integrity, scientific excellence and exceptionally wide intellectual horizons which extended to history, political science and arts. Professor Michalski's death was a particularly deep loss to the whole Polish scientific community and the Polish Academy of Sciences in particular. After graduation, he began his research career at the Institute of Automatic Control, Polish Academy of Science in Warsaw. In 1970 he left his native country and held various prestigious positions at top US universities. His research gained impetus and he soon established himself as a world authority in his areas of interest – notably, he was widely considered a father of machine learning.

This is the second volume of a large two-volume editorial project we wish to dedicate to the memory of the late Professor Ryszard S. Michalski who passed away in 2007. He was one of the fathers of machine learning, an exciting and relevant, both from the practical and theoretical points of view, area in modern computer science and information technology. His research career started in the mid-1960s in Poland, in the Institute of Automation, Polish Academy of Sciences in Warsaw, Poland. He left for the USA in 1970, and since then had worked there at various universities, notably, at the University of Illinois at Urbana – Champaign and finally, until his untimely death, at George Mason University. We, the editors, had been lucky to be able to meet and collaborate with Ryszard for years, indeed some of us knew him when he was still in Poland. After he started working in the USA, he was a frequent visitor to Poland, taking part at many conferences until his death. We had also witnessed with a great personal pleasure honors and awards he had received over the years, notably when some years ago he was elected Foreign Member of the Polish Academy of Sciences among some top scientists and scholars from all over the world, including Nobel prize winners. Professor Michalski's research results influenced very strongly the development of machine learning, data mining, and related areas. Also, he inspired many established and younger scholars and scientists all over the world. We feel very happy that so many top scientists from all over the world agreed to pay the last tribute to Professor Michalski by writing papers in their areas of research. These papers will constitute the most appropriate tribute to Professor Michalski, a devoted scholar and researcher. Moreover, we believe that they will inspire many newcomers and younger researchers in the area of broadly perceived machine learning, data analysis and data mining. The papers included in the two volumes, Machine Learning I and Machine Learning II, cover diverse topics, and various aspects of the fields involved. For convenience of the potential readers, we will now briefly summarize the contents of the particular chapters.

As the 4th Industrial Revolution is restructuring human societal organization into, so-called, Society 5.0, the field of Machine Learning (and its sub-field of Deep Learning) and related technologies is growing continuously and rapidly, developing in both itself and towards applications in many other disciplines. Researchers worldwide aim at incorporating cognitive abilities into machines, such as learning and problem solving. When machines and software systems have been enhanced with Machine Learning/Deep Learning components, they become better and more efficient at performing specific tasks. Consequently, Machine Learning/Deep Learning stands out as a research discipline due to its worldwide pace of growth in both theoretical advances and areas of application, while achieving very high rates of success and promising major impact in science, technology and society. The book at hand aims at exposing its readers to some of the most significant Advances in Machine Learning/Deep Learning-based Technologies. The book consists of an editorial note and an additional ten (10) chapters, all invited from authors who work on the corresponding chapter theme and are recognized for their significant research contributions. In more detail, the chapters in the book are organized into five parts, namely (i) Machine Learning/Deep Learning in Socializing and Entertainment, (ii) Machine Learning/Deep Learning in Education, (iii) Machine Learning/Deep Learning in Security, (iv) Machine Learning/Deep Learning in Time Series Forecasting, and (v) Machine Learning in Video Coding and Information Extraction. This research book is directed towards professors, researchers, scientists, engineers and students in Machine Learning/Deep Learning-related disciplines. It is also directed towards readers who come from other disciplines and are interested in becoming versed in some of the most recent Machine Learning/Deep Learning-based technologies. An extensive list of bibliographic references at the end of each chapter guides the readers to probe further into the application areas of interest to them.

This is the first volume of a large two-volume editorial project we wish to dedicate to the memory of the late Professor Ryszard S. Michalski who passed away in 2007. He was one of the fathers of machine learning, an exciting and relevant, both from the practical and theoretical points of view, area in modern computer science and information technology. His research career started in the mid-1960s in Poland, in the

Institute of Automation, Polish Academy of Sciences in Warsaw, Poland. He left for the USA in 1970, and since then had worked there at various universities, notably, at the University of Illinois at Urbana - Champaign and finally, until his untimely death, at George Mason University. We, the editors, had been lucky to be able to meet and collaborate with Ryszard for years, indeed some of us knew him when he was still in Poland. After he started working in the USA, he was a frequent visitor to Poland, taking part at many conferences until his death. We had also witnessed with a great personal pleasure honors and awards he had received over the years, notably when some years ago he was elected Foreign Member of the Polish Academy of Sciences among some top scientists and scholars from all over the world, including Nobel prize winners. Professor Michalski's research results influenced very strongly the development of machine learning, data mining, and related areas. Also, he inspired many established and younger scholars and scientists all over the world. We feel very happy that so many top scientists from all over the world agreed to pay the last tribute to Professor Michalski by writing papers in their areas of research. These papers will constitute the most appropriate tribute to Professor Michalski, a devoted scholar and researcher. Moreover, we believe that they will inspire many newcomers and younger researchers in the area of broadly perceived machine learning, data analysis and data mining. The papers included in the two volumes, Machine Learning I and Machine Learning II, cover diverse topics, and various aspects of the fields involved. For convenience of the potential readers, we will now briefly summarize the contents of the particular chapters.

Many machine learning tasks involve solving complex optimization problems, such as working on non-differentiable, non-continuous, and non-unique objective functions; in some cases it can prove difficult to even define an explicit objective function. Evolutionary learning applies evolutionary algorithms to address optimization problems in machine learning, and has yielded encouraging outcomes in many applications. However, due to the heuristic nature of evolutionary optimization, most outcomes to date have been empirical and lack theoretical support. This shortcoming has kept evolutionary learning from being well received in the machine learning community, which favors solid theoretical approaches. Recently there have been considerable efforts to address this issue. This book presents a range of those efforts, divided into four parts. Part I briefly introduces readers to evolutionary learning and provides some preliminaries, while Part II presents general theoretical tools for the analysis of running time and approximation performance in evolutionary algorithms. Based on these general tools, Part III presents a number of theoretical findings on major factors in evolutionary optimization, such as recombination, representation, inaccurate fitness evaluation, and population. In closing, Part IV addresses the development of evolutionary learning algorithms with provable theoretical guarantees for several representative tasks, in which evolutionary learning offers excellent performance.

Wireless Sensor Network Technologies for Information Explosion Era The amount and value of information available due to rapid spread of information technology is exploding. Typically, large enterprises have approximately a petabyte of operational data stored in hundreds of data repositories supporting thousands of applications. Data storage volumes grow in excess of 50% annually. This growth is expected to continue due to vast proliferation of existing information systems and the introduction of new data sources. Wireless Sensor Networks (WSNs) represent one of the most notable examples of such new data sources. In recent few years, various types of WSNs have been deployed and the amount of information generated by wireless sensors increases rapidly. The information explosion requires establishing novel data processing and communication techniques for WSNs. This volume aims to cover both theoretical and practical aspects related to this challenge, and it explores directions for future research to enable efficient utilization of WSNs in the information-explosion era. The book is organized in three main parts that consider (1) technical issues of WSNs, (2) the integration of multiple WSNs, and (3) the development of WSNs systems and testbeds for conducting practical experiments. Each part consists of three chapters.

The Volume of "Advances in Machine Learning and Data Science - Recent Achievements and Research Directives" constitutes the proceedings of First International Conference on Latest Advances in Machine Learning and Data Science (LAMDA 2017). The 37 regular papers presented in this volume were carefully reviewed and selected from 123 submissions. These days we find many computer programs that exhibit various useful learning methods and commercial applications. Goal of machine learning is to develop computer programs that can learn from experience. Machine learning involves knowledge from various disciplines like, statistics, information theory, artificial intelligence, computational complexity, cognitive science and biology. For problems like handwriting recognition, algorithms that are based on machine learning out perform all other approaches. Both machine learning and data science are interrelated. Data science is an umbrella term to be used for techniques that clean data and extract useful information from data. In field of data science, machine learning algorithms are used frequently to identify valuable knowledge from commercial databases containing records of different industries, financial transactions, medical records, etc. The main objective of this book is to provide an overview on latest advancements in the field of machine learning and data science, with solutions to problems in field of image, video, data and graph processing, pattern recognition, data structuring, data clustering, pattern mining, association rule based approaches, feature extraction techniques, neural networks, bio inspired learning and various machine learning algorithms.

This book gathers selected high-quality papers presented at the International Conference on Machine Learning and Computational Intelligence (ICMLCI-2019), jointly organized by Kunming University of Science and Technology and the Interscience Research Network, Bhubaneswar, India, from April 6 to 7, 2019. Addressing virtually all aspects of intelligent systems, soft computing and machine learning, the topics covered include: prediction; data mining; information retrieval; game playing; robotics; learning methods; pattern visualization; automated knowledge acquisition; fuzzy, stochastic and probabilistic computing; neural computing; big data; social networks and applications of soft computing in various areas. This tutorial text gives a unifying perspective on machine learning by covering both probabilistic and deterministic approaches -which are based on optimization techniques – together with the Bayesian inference approach, whose essence lies in the use of a hierarchy of probabilistic models. The book presents the major machine learning methods as they have been developed in different disciplines, such as statistics, statistical and adaptive signal processing and computer science. Focusing on the physical reasoning behind the mathematics, all the various methods and techniques are explained in depth, supported by examples and problems, giving an invaluable resource to the student and researcher for understanding and applying machine learning concepts. The book builds carefully from the basic classical methods to the most recent trends, with chapters written to be as self-contained as possible, making the text suitable for different courses: pattern recognition, statistical/adaptive signal processing, statistical/Bayesian learning, as well as short courses on sparse modeling, deep learning, and probabilistic graphical models. All major classical techniques: Mean/Least-Squares regression and filtering, Kalman filtering, stochastic approximation and online learning, Bayesian classification, decision trees, logistic regression and boosting methods. The latest trends: Sparsity, convex analysis and optimization, online distributed algorithms, learning in RKH spaces, Bayesian inference, graphical and hidden Markov models, particle filtering, deep learning, dictionary learning and latent variables modeling. Case studies - protein folding prediction, optical character recognition, text authorship identification, fMRI data analysis, change point detection, hyperspectral image unmixing, target localization, channel equalization and echo cancellation, show how the theory can

be applied. MATLAB code for all the main algorithms are available on an accompanying website, enabling the reader to experiment with the code.

"This book provides analysis, characterization and refinement of software engineering data in terms of machine learning methods. It depicts applications of several machine learning approaches in software systems development and deployment, and the use of machine learning methods to establish predictive models for software quality while offering readers suggestions by proposing future work in this emerging research field"--Provided by publisher.

This book is a collection of the latest applications of methods from soft computing and machine learning in image processing. It explores different areas ranging from image segmentation to the object recognition using complex approaches, and includes the theory of the methodologies used to provide an overview of the application of these tools in image processing. The material has been compiled from a scientific perspective, and the book is primarily intended for undergraduate and postgraduate science, engineering, and computational mathematics students. It can also be used for courses on artificial intelligence, advanced image processing, and computational intelligence, and is a valuable resource for researchers in the evolutionary computation, artificial intelligence and image processing communities.

This book describes new theories and applications of artificial neural networks, with a special focus on addressing problems in neuroscience, biology and biophysics and cognitive research. It covers a wide range of methods and technologies, including deep neural networks, large-scale neural models, brain-computer interface, signal processing methods, as well as models of perception, studies on emotion recognition, self-organization and many more. The book includes both selected and invited papers presented at the XX International Conference on Neuroinformatics, held in Moscow, Russia on October 8-12, 2018.

Foreword by Oliver Schabenberger, PhD Executive Vice President, Chief Operating Officer and Chief Technology Officer
SAS Dive into deep learning! Machine learning and deep learning are ubiquitous in our homes and workplaces—from machine translation to image recognition and predictive analytics to autonomous driving. Deep learning holds the promise of improving many everyday tasks in a variety of disciplines. Much deep learning literature explains the mechanics of deep learning with the goal of implementing cognitive applications fueled by Big Data. This book is different. Written by an expert in high-performance analytics, *Deep Learning for Numerical Applications with SAS®* introduces a new field: Deep Learning for Numerical Applications (DL4NA). Contrary to deep learning, the primary goal of DL4NA is not to learn from data but to dramatically improve the performance of numerical applications by training deep neural networks. *Deep Learning for Numerical Applications with SAS®* presents deep learning concepts in SAS along with step-by-step techniques that allow you to easily reproduce the examples on your high-performance analytics systems. It also discusses the latest hardware innovations that can power your SAS programs: from many-core CPUs to GPUs to FPGAs to ASICs. This book assumes the reader has no prior knowledge of high-performance computing, machine learning, or deep learning. It is intended for SAS developers who want to develop and run the fastest analytics. In addition to discovering the latest trends in hybrid architectures with GPUs and FPGAs, readers will learn how to Use deep learning in SAS Speed up their analytics using deep learning Easily write highly parallel programs using the many task computing paradigms For sample material and supporting resources, please see the author's page. This book is part of the SAS Press program.

This book offers the latest advances and results in the fields of Machine Learning and Deep Learning for Wireless Communication and provides positive and critical discussions on the challenges and prospects. It provides a broad spectrum in understanding the improvements in Machine Learning and Deep Learning that are motivating by the specific constraints posed by wireless networking systems. The book offers an extensive overview on intelligent Wireless Communication systems and its underlying technologies, research challenges, solutions, and case studies. It provides information on intelligent wireless communication systems and its models, algorithms and applications. The book is written as a reference that offers the latest technologies and research results to various industry problems.

A new edition of a graduate-level machine learning textbook that focuses on the analysis and theory of algorithms. This book is a general introduction to machine learning that can serve as a textbook for graduate students and a reference for researchers. It covers fundamental modern topics in machine learning while providing the theoretical basis and conceptual tools needed for the discussion and justification of algorithms. It also describes several key aspects of the application of these algorithms. The authors aim to present novel theoretical tools and concepts while giving concise proofs even for relatively advanced topics. *Foundations of Machine Learning* is unique in its focus on the analysis and theory of algorithms. The first four chapters lay the theoretical foundation for what follows; subsequent chapters are mostly self-contained. Topics covered include the Probably Approximately Correct (PAC) learning framework; generalization bounds based on Rademacher complexity and VC-dimension; Support Vector Machines (SVMs); kernel methods; boosting; on-line learning; multi-class classification; ranking; regression; algorithmic stability; dimensionality reduction; learning automata and languages; and reinforcement learning. Each chapter ends with a set of exercises. Appendixes provide additional material including concise probability review. This second edition offers three new chapters, on model selection, maximum entropy models, and conditional entropy models. New material in the appendixes includes a major section on Fenchel duality, expanded coverage of concentration inequalities, and an entirely new entry on information theory. More than half of the exercises are new to this edition.

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.

Intelligent Autonomous Systems (IAS) are the physical embodiment of machine intelligence providing a core concept for integrating various advanced technologies with pattern recognition and learning. The basic philosophy of IAS research is to explore and understand the nature of intelligence in problems of perception, reasoning, learning and control in order to develop and implement the theory to engineered realization. In other words, the objective is to formulate various methodologies for the development of robots which can operate autonomously and exhibit intelligent behavior by making appropriate decisions to perform the right task at the right time. Since IAS basically deals with the integration of machines, computing, sensing, and software to create intelligent systems capable of interacting with the complexities of the real world, advanced topics like soft computing, artificial life, evolutionary biology, and cognitive psychology have great promise in improving its intelligence and performance. Because of the inter-disciplinary character, the subject has several challenging issues for research, design and development covering a number of disciplines. These issues are further concerned with the development of both technology and methodology apart from various operations. The present research monograph titled "Intelligent Autonomous Systems: Foundations and Applications", edited by two renowned researchers, Professor Dilip K. Pratihari of IIT, Kharagpur, India and Professor Lakhmi C. Jain, University of South Australia, Australia, provides a fairly representative cross-section of the activities that is going on all over the world in this area. At the dawn of the 4th Industrial Revolution, the field of Deep Learning (a sub-field of Artificial Intelligence and Machine Learning) is growing continuously and rapidly, developing both theoretically and towards applications in increasingly many and diverse other disciplines. The book at hand aims at exposing its reader to some of the most significant recent advances in deep learning-based technological applications and consists of an editorial note and an additional fifteen (15) chapters. All chapters in the book were invited from authors who work in the corresponding chapter theme and are recognized for their significant research contributions. In more detail, the chapters in the book are organized into six parts, namely (1) Deep Learning in Sensing, (2) Deep Learning in Social Media and IOT, (3) Deep Learning in the Medical Field, (4) Deep Learning in Systems Control, (5) Deep Learning in Feature Vector Processing, and (6) Evaluation of Algorithm Performance. This research book is directed towards professors, researchers, scientists, engineers and students in computer science-related disciplines. It is also directed towards readers who come from other disciplines and are interested in becoming versed in some of the most recent deep learning-based technological applications. An extensive list of bibliographic references at the end of each chapter guides the readers to probe deeper into their application areas of interest.

This book gathers a collection of high-quality peer-reviewed research papers presented at the 2nd International Conference on Data and Information Sciences (ICDIS 2019), held at Raja Balwant Singh Engineering Technical Campus, Agra, India, on March 29–30, 2019. In chapters written by leading researchers, developers, and practitioner from academia and industry, it covers virtually all aspects of computational sciences and information security, including central topics like artificial intelligence, cloud computing, and big data. Highlighting the latest developments and technical solutions, it will show readers from the computer industry how to capitalize on key advances in next-generation computer and communication technology.

Advances in Machine Learning and Data Mining for Astronomy documents numerous successful collaborations among computer scientists, statisticians, and astronomers who illustrate the application of state-of-the-art machine learning and data mining techniques in astronomy. Due to the massive amount and complexity of data in most scientific disciplines

A large international conference on Advances in Machine Learning and Data Analysis was held in UC Berkeley, California, USA, October 22-24, 2008, under the auspices of the World Congress on Engineering and Computer Science (WCECS 2008). This volume contains sixteen revised and extended research articles written by prominent researchers participating in the conference. Topics covered include Expert system, Intelligent decision making, Knowledge-based systems, Knowledge extraction, Data analysis tools, Computational biology, Optimization algorithms, Experiment designs, Complex system identification, Computational modeling, and industrial applications. Advances in Machine Learning and Data Analysis offers the state of the art of tremendous advances in machine learning and data analysis and also serves as an excellent reference text for researchers and graduate students, working on machine learning and data analysis.

This book focuses on various advanced technologies which integrate with machine learning to assist one of the most leading industries, healthcare. It presents recent research works based on machine learning approaches supported by medical and information communication technologies with the use of data and image analysis. The book presents insight about techniques which broadly deals in delivery of quality, accurate and affordable healthcare solutions by predictive, proactive and preventative methods. The book also explores the possible use of machine learning in enterprises, such as enhanced medical imaging/diagnostics, understanding medical data, drug discovery and development, robotic surgery and automation, radiation treatments, creating electronic smart records and outbreak prediction.

Intelligent Information Systems (IIS) can be defined as the next generation of Information Systems (IS) developed as a result of integration of AI and database (DB) technologies. IIS embody knowledge that allows them to exhibit intelligent behavior, allows them to cooperate with users and other systems in problem solving, discovery, retrieval, and manipulation of data and knowledge. For any IIS to serve its purpose, the information must be available when it is needed. This means that the computing systems used to store data and process the information, and the security controls used to protect it must be functioning correctly. This book covers some of the above topics and it is divided into four sections: Classification, Approximation and Data Security, Knowledge Management, and Application of IIS to medical and music domains.

Machine learning (ML) is changing virtually every aspect of our lives. Today ML algorithms accomplish tasks that until recently only expert humans could perform. As it relates to finance, this is the most exciting time to adopt a disruptive technology that will transform how everyone invests for generations. Readers will learn how to structure Big data in a way that is amenable to ML algorithms; how to conduct research with ML algorithms on that data; how to use supercomputing methods; how to backtest your discoveries while avoiding false positives. The book addresses real-life problems faced by practitioners on a daily basis, and explains scientifically sound solutions using math, supported by code and examples. Readers become active users who can test the proposed solutions in their particular setting. Written by a recognized expert and portfolio manager, this book will equip investment professionals with the groundbreaking tools needed to succeed in modern finance.

Recent advances in computational algorithms, along with the advent of whole slide imaging as a platform for embedding artificial intelligence (AI), are transforming pattern recognition and image interpretation for diagnosis and prognosis. Yet most pathologists have just a passing knowledge of data mining, machine learning, and AI, and little exposure to the vast potential of these powerful new tools for medicine in general and pathology in particular. In Artificial Intelligence and Deep Learning in Pathology, Dr. Stanley Cohen covers the nuts and bolts of all aspects of machine learning, up to and including AI, bringing familiarity and understanding to pathologists at all levels of experience. Focuses heavily on applications in medicine, especially pathology, making unfamiliar material accessible and avoiding complex mathematics whenever possible. Covers digital pathology as a platform for primary diagnosis and augmentation via deep learning, whole slide imaging for 2D and 3D analysis, and general principles of image analysis and deep learning. Discusses and explains recent accomplishments such as algorithms used to diagnose skin cancer

from photographs, AI-based platforms developed to identify lesions of the retina, using computer vision to interpret electrocardiograms, identifying mitoses in cancer using learning algorithms vs. signal processing algorithms, and many more. This book constitutes the refereed proceedings of the Second International Symposium on Intelligent Data Analysis, IDA-97, held in London, UK, in August 1997. The volume presents 50 revised full papers selected from a total of 107 submissions. Also included is a keynote, Intelligent Data Analysis: Issues and Opportunities, by David J. Hand. The papers are organized in sections on exploratory data analysis, preprocessing and tools; classification and feature selection; medical applications; soft computing; knowledge discovery and data mining; estimation and clustering; data quality; qualitative models.

The First Asian Conference on Machine Learning (ACML 2009) was held at Nanjing, China during November 2–4, 2009. This was the first edition of a series of annual conferences which aim to provide a leading international forum for researchers in machine learning and related fields to share their new ideas and research findings. This year we received 113 submissions from 18 countries and regions in Asia, Australasia, Europe and North America. The submissions went through a rigorous double-blind reviewing process. Most submissions received four reviews, a few submissions received five reviews, while only several submissions received three reviews. Each submission was handled by an Area Chair who coordinated discussions among reviewers and made recommendation on the submission. The Program Committee Chairs examined the reviews and meta-reviews to further guarantee the reliability and integrity of the reviewing process. Twenty-nine papers were selected after this process. To ensure that important revisions required by reviewers were incorporated into the final accepted papers, and to allow submissions which would have potential after a careful revision, this year we launched a “revision double-check” process. In short, the above-mentioned 29 papers were conditionally accepted, and the authors were requested to incorporate the “important-and-must” revisions summarized by area chairs based on reviewers’ comments. The revised final version and the revision list of each conditionally accepted paper was examined by the Area Chair and Program Committee Chairs. Papers that failed to pass the examination were finally rejected.

In this groundbreaking new volume, computer researchers discuss the development of technologies and specific systems that can interpret data with respect to domain knowledge. Although the chapters each illuminate different aspects of image interpretation, all utilize a common approach - one that asserts such interpretation must involve perceptual learning in terms of automated knowledge acquisition and application, as well as feedback and consistency checks between encoding, feature extraction, and the known knowledge structures in a given application domain. The text is profusely illustrated with numerous figures and tables to reinforce the concepts discussed.

Recent Advances in Reinforcement Learning addresses current research in an exciting area that is gaining a great deal of popularity in the Artificial Intelligence and Neural Network communities. Reinforcement learning has become a primary paradigm of machine learning. It applies to problems in which an agent (such as a robot, a process controller, or an information-retrieval engine) has to learn how to behave given only information about the success of its current actions. This book is a collection of important papers that address topics including the theoretical foundations of dynamic programming approaches, the role of prior knowledge, and methods for improving performance of reinforcement-learning techniques. These papers build on previous work and will form an important resource for students and researchers in the area. Recent Advances in Reinforcement Learning is an edited volume of peer-reviewed original research comprising twelve invited contributions by leading researchers. This research work has also been published as a special issue of Machine Learning (Volume 22, Numbers 1, 2 and 3).

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