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As modern technologies continue to develop and evolve, the ability of users to adapt with new systems becomes a paramount concern. Research into new ways for humans to make use of advanced computers and other such technologies through artificial intelligence and computer simulation is necessary to fully realize the potential of tools in the 21st century. Advanced Methodologies and Technologies in Artificial Intelligence, Computer Simulation, and Human-Computer Interaction provides emerging research in advanced trends in robotics, AI, simulation, and human-computer interaction. Readers will learn about the positive applications of artificial intelligence and human-computer interaction in various disciplines such as business and medicine. This book is a valuable resource for IT professionals, researchers, computer scientists, and researchers invested in assistive technologies, artificial intelligence, robotics, and computer simulation.

This book gathers research contributions on recent advances in intelligent and distributed computing. A major focus is placed on new techniques and applications for several highlydemanded research directions: Internet of Things, Cloud Computing and Big Data, Data Mining and Machine Learning, Multi-agent and Service-Based Distributed Systems, Distributed Algorithms and Optimization, Modeling Operational Processes, Social Network Analysis and Inappropriate Content Counteraction, Cyber-Physical Security and Safety, Intelligent Distributed Decision Support Systems, Intelligent Human-Machine Interfaces, VisualAnalytics and others. The book represents the peer-reviewed proceedings of the 13thInternational Symposium on Intelligent Distributed

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Computing (IDC 2019), which was held in St. Petersburg, Russia, from October 7 to 9, 2019.

Artificial intelligence (AI) and robotics are major breakthrough technologies that are transforming the economy and society. The OECD's Artificial Intelligence and the Future of Skills (AIFS) project is developing a programme to assess the capabilities of AI and robotics, and their impact on education and work.

This book describes the latest research accomplishments, innovations, and visions in the field of robotics as presented at the 13th International Conference on Intelligent Autonomous Systems (IAS), held in Padua in July 2014, by leading researchers, engineers, and practitioners from across the world. The contents amply confirm that robots, machines, and systems are rapidly achieving intelligence and autonomy, mastering more and more capabilities such as mobility and manipulation, sensing and perception, reasoning, and decision making. A wide range of research results and applications are covered, and particular attention is paid to the emerging role of autonomous robots and intelligent systems in industrial production, which reflects their maturity and robustness. The contributions have been selected through a rigorous peer-review process and contain many exciting and visionary ideas that will further galvanize the research community, spurring novel research directions. The series of biennial IAS conferences commenced in 1986 and represents a premiere event in robotics.

The third edition of this bestseller examines the principles of artificial intelligence and their application to engineering and science, as well as techniques for developing intelligent systems to solve practical problems. Covering the full spectrum of intelligent systems techniques, it incorporates knowledge-based systems, computational intelligence, and their hybrids. Using clear and concise language, Intelligent

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Systems for Engineers and Scientists, Third Edition features updates and improvements throughout all chapters. It includes expanded and separated chapters on genetic algorithms and single-candidate optimization techniques, while the chapter on neural networks now covers spiking networks and a range of recurrent networks. The book also provides extended coverage of fuzzy logic, including type-2 and fuzzy control systems. Example programs using rules and uncertainty are presented in an industry-standard format, so that you can run them yourself. The first part of the book describes key techniques of artificial intelligence—including rule-based systems, Bayesian updating, certainty theory, fuzzy logic (types 1 and 2), frames, objects, agents, symbolic learning, case-based reasoning, genetic algorithms, optimization algorithms, neural networks, hybrids, and the Lisp and Prolog languages. The second part describes a wide range of practical applications in interpretation and diagnosis, design and selection, planning, and control. The author provides sufficient detail to help you develop your own intelligent systems for real applications. Whether you are building intelligent systems or you simply want to know more about them, this book provides you with detailed and up-to-date guidance. Check out the significantly expanded set of free web-based resources that support the book at:

<http://www.adrianhopgood.com/aitoolkit/>

Meeting the Challenges of Existential Threats through Educational Innovation is the first book of its kind to provide an educational and systematic analysis of problems and solutions regarding the most pressing threats that humankind is facing. The book makes a case for the importance of education responding to significant threats; including climate change, pandemics, decline in global biodiversity, overpopulation, egoism, ideologies, nuclear, biological and chemical warfare, inequality, artificial intelligence, and

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ignorance and the distortion of truth. Written by leading experts in their field based on cutting-edge research, the chapters explore these issues and offer suggestions for how education can address these problems in the future. This groundbreaking and highly topical book will be an essential reading for academics, researchers and post-graduate students in the fields of education research, environmental studies, educational politics and organizational management. Just a sample of the contents ... contains over 2,800 total pages

PROSPECTS FOR THE RULE OF LAW IN CYBERSPACE
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CYBER WARFARE GOVERNANCE: EVALUATION OF CURRENT INTERNATIONAL AGREEMENTS ON THE OFFENSIVE USE OF CYBER
Cyber Attacks and the Legal Justification for an Armed Response
UNTYING OUR HANDS: RECONSIDERING CYBER AS A SEPARATE INSTRUMENT OF NATIONAL POWER
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Recommendations for Model-Driven Paradigms for Integrated Approaches to Cyber Defense
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SPECIAL OPERATIONS AND CYBER WARFARE
LESSONS FROM THE FRONT: A CASE STUDY OF RUSSIAN CYBER WARFARE
ADAPTING UNCONVENTIONAL WARFARE DOCTRINE TO CYBERSPACE OPERATIONS: AN EXAMINATION OF HACKTIVIST BASED INSURGENCIES
Addressing Human Factors
Gaps in Cyber Defense
Airpower History and the Cyber Force of the Future
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THE COMMAND OF THE TREND: SOCIAL MEDIA AS A WEAPON IN THE INFORMATION AGE
SPYING FOR THE RIGHT REASONS: CONTESTED

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REPORT: REMODELING AIR FORCE CYBER COMMAND &
CONTROL THE CYBER WAR: MAINTAINING AND
CONTROLLING THE “KEY CYBER TERRAIN” OF THE
CYBERSPACE DOMAIN WHEN NORMS FAIL: NORTH
KOREA AND CYBER AS AN ELEMENT OF STATECRAFT
AN ANTIFRAGILE APPROACH TO PREPARING FOR
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ASSURANCE SOURCES OF MISSION UNCERTAINTY
Concurrency Attacks and Defenses Cyber Workforce
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Targeting →Theory IS BRINGING BACK WARRANT
OFFICERS THE ANSWER? A LOOK AT HOW THEY
COULD WORK IN THE AIR FORCE CYBER OPERATIONS
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FORCE SUPPORT TO SPECIAL OPERATIONS IN THE
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MEANS: UNVEILING CHINA’S QUEST FOR
INFORMATION DOMINANCE THE ISLAMIC STATE’S
TACTICS IN SYRIA: ROLE OF SOCIAL MEDIA IN SHIFTING
A PEACEFUL ARAB SPRING INTO TERRORISM NON-
LETHAL WEAPONS: THE KEY TO A MORE AGGRESSIVE
STRATEGY TO COMBAT TERRORISM THOUGHTS
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Defenses Cyber Workforce Retention
With its cost efficiency, enabling of collaboration and sharing
of resources, and its ability to improve access, cloud
computing is likely to play a big role in the classrooms of
tomorrow. Cloud Computing for Teaching and Learning:
Strategies for Design and Implementation provides the latest
information about cloud development and cloud applications

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in teaching and learning. The book also include empirical research findings in these areas for professionals and researchers working in the field of e-learning who want to implement teaching and learning with cloud computing, as well as provide insights and support to executives concerned with cloud development and cloud applications in e-learning communities and environments.

Artificial Intelligence continues to be one of the most exciting and fast-developing fields of computer science. This book presents the 177 long papers and 123 short papers accepted for ECAI 2016, the latest edition of the biennial European Conference on Artificial Intelligence, Europe's premier venue for presenting scientific results in AI. The conference was held in The Hague, the Netherlands, from August 29 to September 2, 2016. ECAI 2016 also incorporated the conference on Prestigious Applications of Intelligent Systems (PAIS) 2016, and the Starting AI Researcher Symposium (STAIRS). The papers from PAIS are included in this volume; the papers from STAIRS are published in a separate volume in the Frontiers in Artificial Intelligence and Applications (FAIA) series. Organized by the European Association for Artificial Intelligence (EurAI) and the Benelux Association for Artificial Intelligence (BNVKI), the ECAI conference provides an opportunity for researchers to present and hear about the very best research in contemporary AI. This proceedings will be of interest to all those seeking an overview of the very latest innovations and developments in this field.

Case-based reasoning is a methodology with a long tradition in artificial intelligence that brings together reasoning and machine learning techniques to solve problems based on past experiences or cases. Given a problem to be solved, reasoning involves the use of methods to retrieve similar past cases in order to reuse their solution for the problem at hand. Once the problem has been solved, learning methods can be

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applied to improve the knowledge based on past experiences. In spite of being a broad methodology applied in industry and services, case-based reasoning has often been forgotten in both artificial intelligence and machine learning books. The aim of this book is to present a concise introduction to case-based reasoning providing the essential building blocks for the design of case-based reasoning systems, as well as to bring together the main research lines in this field to encourage students to solve current CBR challenges.

In recent years, our world has experienced a profound shift and progression in available computing and knowledge sharing innovations. These emerging advancements have developed at a rapid pace, disseminating into and affecting numerous aspects of contemporary society. This has created a pivotal need for an innovative compendium encompassing the latest trends, concepts, and issues surrounding this relevant discipline area. During the past 15 years, the Encyclopedia of Information Science and Technology has become recognized as one of the landmark sources of the latest knowledge and discoveries in this discipline. The Encyclopedia of Information Science and Technology, Fourth Edition is a 10-volume set which includes 705 original and previously unpublished research articles covering a full range of perspectives, applications, and techniques contributed by thousands of experts and researchers from around the globe. This authoritative encyclopedia is an all-encompassing, well-established reference source that is ideally designed to disseminate the most forward-thinking and diverse research findings. With critical perspectives on the impact of information science management and new technologies in modern settings, including but not limited to computer science, education, healthcare, government, engineering, business, and natural and physical sciences, it is a pivotal

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and relevant source of knowledge that will benefit every professional within the field of information science and technology and is an invaluable addition to every academic and corporate library.

Ideal for learning or reference, this book explains the five main principles of algorithm design and their implementation in Haskell.

Artificial Intelligence presents a practical guide to AI, including agents, machine learning and problem-solving simple and complex domains.

In recent years, the concept of energy has been revised and a new model based on the principle of sustainability has become more and more pervasive. The appraisal of energy technologies and projects is complex and uncertain as the related decision making has to encompass environmental, technical, economic and social factors and information sources. The scientific procedure of assessment has a vital role as it can supply the right tools to evaluate the actual situation and make realistic forecasts of the effects and outcomes of any actions undertaken. Assessment and Simulation Tools for Sustainable Energy Systems offers reviews of the main assessment and simulation methods used for effective energy assessment. Divided across three sections, Assessment and Simulation Tools for Sustainable Energy Systems develops the reader's ability to select suitable tools to support decision making and implementation of sustainable energy projects. The first is dedicated to the analysis of theoretical foundations and applications of multi-criteria decision making. This is followed by chapters concentrating on the theory and practice of fuzzy inference, neural nets and algorithms genetics. Finally, simulation methods such as Monte Carlo analysis, mathematical programming and others are detailed. This comprehensive illustration of these tools and their application makes

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Assessment and Simulation Tools for Sustainable Energy Systems a key guide for researchers, scientists, managers, politicians and industry professionals developing the field of sustainable energy systems. It may also prompt further advancements in soft computing and simulation issues for students and researchers.

This introduction just aims to be a fast foreword to the special topic now turned into an e-book. The Editorial "Decision-Making Experiments under a Philosophical Analysis: Human Choice as a Challenge for Neuroscience" alongside with my opinion article "Neurophilosophical considerations on decision making: Pushing-up the frontiers without disregarding their foundations" play the real role of considering in more details the articles and the whole purpose of this e-book. What I must highlight in this foreword is that our intention with such a project was to deepen into the very foundations of our current paradigms in decision neuroscience and to philosophically moot its foundations and repercussions. Normal Science (a term coined by Philosopher Thomas Kuhn) works under a research consensus among a scientific community: A shared paradigm, consolidated methods, widespread convictions. Pragmatically, winning formulas must be kept, although, not at any cost. What differentiates a gifted and revolutionary scientist from a more bureaucratic colleague is the capacity and willingness of constantly reevaluating, depurating and refining his/her own paradigm. That is best strategy to avoid that a paradigm itself would gradually come under challenge. In my view, some achievements, in this sense, were brought about in our project. The e-book will be inspiring and informative for both neuroscientists that are concerned with the very foundations of their works and for philosophers that are not blind to empirical evidence. Kant once said: "Thoughts without content are empty, intuitions without concepts are blind". Paraphrasing Kant we could say:

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Philosophy without science is empty, science without philosophy is blind.

Recent advances in the area of lifted inference, which exploits the structure inherent in relational probabilistic models. Statistical relational AI (StaRAI) studies the integration of reasoning under uncertainty with reasoning about individuals and relations. The representations used are often called relational probabilistic models. Lifted inference is about how to exploit the structure inherent in relational probabilistic models, either in the way they are expressed or by extracting structure from observations. This book covers recent significant advances in the area of lifted inference, providing a unifying introduction to this very active field. After providing necessary background on probabilistic graphical models, relational probabilistic models, and learning inside these models, the book turns to lifted inference, first covering exact inference and then approximate inference. In addition, the book considers the theory of liftability and acting in relational domains, which allows the connection of learning and reasoning in relational domains.

This book is reflective of a science-based vision of the future development paradigm of economic and social systems. It deals with the digitization as the technological basis for the future development of economic and social systems and presents a review of groundbreaking technologies and prospects for their application. The specific character of the industry and prospects for the application of digital technologies in business are analyzed. A rationale is provided for future prospects for the sustainable development of economic and social systems in a digital economy. The authors determine the process of the formation and development of the information-oriented society, social and educational aspects of the digitization, as well as the institutional framework of the digital future of social and

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economic systems. The book combines the best works following the results of the 12th International Research-to-Practice Conference "Artificial Intelligence: Anthropogenic Nature vs. Social Origin" that was held by the Institute of Scientific Communications (ISC) in cooperation with the Siberian Federal University and the Krasnoyarsk Regional Fund of support of scientific and scientific-technical activities on 5-7 December 2019, in Krasnoyarsk, Russia, as well as following the results of the 3rd International Research-to-Practice Conference "Economic and Social Systems: Paradigms for the Future" that was held by the ISC in cooperation with the Pyatigorsk State University on 5-6 February 2020. The target audience of the book consists of representatives of the academic community concerned with the future prospects for the development of economic and social systems, as well as economic agents engaged in the digitization of business processes, and representatives of public agencies regulating the development of business systems for their progressivity, sustainability and competitiveness. .

Artificial Intelligence: A Modern Approach offers the most comprehensive, up-to-date introduction to the theory and practice of artificial intelligence. Number one in its field, this textbook is ideal for one or two-semester, undergraduate or graduate-level courses in Artificial Intelligence.

This interdisciplinary and international handbook captures and shapes much needed reflection on normative frameworks for the production, application, and use of artificial intelligence in all spheres of individual, commercial, social, and public life. This issue of Neuroimaging Clinics of North America focuses on Artificial Intelligence and Machine Learning and is edited by Dr. Reza Forghani. Articles will include: A Brief History of Artificial Intelligence; Evolution of Approaches for Computerized Image Analysis; Overview of Machine Learning

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Part 1: Classic Approaches; Overview of Machine Learning
Part 2: Artificial Neural Networks & Deep Learning; Overview of Natural Language Processing; Artificial Intelligence & Stroke Imaging: An East Coast Perspective; Artificial Intelligence & Stroke Imaging: A West Coast Perspective; Artificial Intelligence Applications for Brain Tumor Imaging; Diverse Applications of Artificial Intelligence in Neuroradiology; Artificial Intelligence Applications for Head and Neck Imaging; Artificial Intelligence Applications for Predictive Analytics and Workflow Optimization; Artificial Intelligence, Advanced Visualization, and 3D Printing; Ethical & Legal Considerations for Artificial Intelligence; Comprehensive (or 360) Artificial Intelligence: Beyond Image Interpretation Alone, and more!

In this text Hasse presents a new, inclusive, posthuman learning theory, designed to keep up with the transformations of human learning resulting from new technological experiences, as well as considering the expanding role of cyborg devices and robots in learning. This ground-breaking book draws on research from across psychology, education, and anthropology to present a truly interdisciplinary examination of the relationship between technology, learning and humanity. Posthumanism questions the self-evident status of human beings by exploring how technology is changing what can be categorised as 'human'. In this book, the author applies a posthumanist lens to traditional learning theory, challenging conventional understanding of what a human learner is, and considering how technological advances are changing how we think about this question. Throughout the book Hasse uses vignettes of her own research and that of other prominent academics to exemplify what technology can tell us about how we learn and how this can be observed in real-life settings. Posthumanist Learning is essential reading for students and researchers of

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posthumanism and learning theory from a variety of backgrounds, including psychology, education, anthropology, robotics and philosophy.

In *Great Ideas in Computer Science: A Gentle Introduction*, Alan Biermann presents the "great ideas" of computer science that together comprise the heart of the field. He condenses a great deal of complex material into a manageable, accessible form. His treatment of programming, for example, presents only a few features of Pascal and restricts all programs to those constructions. Yet most of the important lessons in programming can be taught within these limitations. The student's knowledge of programming then provides the basis for understanding ideas in compilation, operating systems, complexity theory, noncomputability, and other topics. Whenever possible, the author uses common words instead of the specialized vocabulary that might confuse readers. Readers of the book will learn to write a variety of programs in Pascal, design switching circuits, study a variety of Von Neumann and parallel architectures, hand simulate a computer, examine the mechanisms of an operating system, classify various computations as tractable or intractable, learn about noncomputability, and explore many of the important issues in artificial intelligence. This second edition has new chapters on simulation, operating systems, and networks. In addition, the author has upgraded many of the original chapters based on student and instructor comments, with a view toward greater simplicity and readability.

This paper aims at identifying emerging computational intelligence trends for the design and modeling of complex biometric-enabled infrastructure and systems. Biometric-enabled systems are evolving towards deep learning and deep inference using the principles of adaptive computing, – the front tides of the modern computational intelligence

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domain.

Only ten years ago driving was about horsepower, style and comfort -- people said they loved their cars. Today, we can see the transformation in the automotive industry including ridesharing and carsharing with the new concepts of mobility and motion changing every day. Will consumers lose the emotion they previously had for their vehicles? Maybe the new e-motion will be a different type of connection, one that understands, learns, and reasons as you move through your life; this is the concept of a cognitive vehicle and lifestyle that is discussed within. This book provides the trends and technologies in the automotive industry as it moves from a connected vehicle to a cognitive vehicle and how automotive manufactures facing the market shift from an organizational-centered to an individual-centered economy.

Ongoing advancements in modern technology have led to significant developments in artificial intelligence. With the numerous applications available, it becomes imperative to conduct research and make further progress in this field. *Artificial Intelligence: Concepts, Methodologies, Tools, and Applications* provides a comprehensive overview of the latest breakthroughs and recent progress in artificial intelligence. Highlighting relevant technologies, uses, and techniques across various industries and settings, this publication is a pivotal reference source for researchers, professionals, academics, upper-level students, and practitioners interested in emerging perspectives in the field of artificial intelligence.

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Handbook of the History of Logic brings to the

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development of logic the best in modern techniques of historical and interpretative scholarship. Computational logic was born in the twentieth century and evolved in close symbiosis with the advent of the first electronic computers and the growing importance of computer science, informatics and artificial intelligence. With more than ten thousand people working in research and development of logic and logic-related methods, with several dozen international conferences and several times as many workshops addressing the growing richness and diversity of the field, and with the foundational role and importance these methods now assume in mathematics, computer science, artificial intelligence, cognitive science, linguistics, law and many engineering fields where logic-related techniques are used inter alia to state and settle correctness issues, the field has diversified in ways that even the pure logicians working in the early decades of the twentieth century could have hardly anticipated. Logical calculi, which capture an important aspect of human thought, are now amenable to investigation with mathematical rigour and computational support and fertilized the early dreams of mechanised reasoning: “Calcuemus . The Dartmouth Conference in 1956 – generally considered as the birthplace of artificial intelligence – raised explicitly the hopes for the new possibilities that the advent of electronic computing machinery offered: logical statements could now be executed on a machine with all the far-reaching consequences that ultimately led to logic programming, deduction systems for mathematics and engineering, logical design and verification of computer

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software and hardware, deductive databases and software synthesis as well as logical techniques for analysis in the field of mechanical engineering. This volume covers some of the main subareas of computational logic and its applications. Chapters by leading authorities in the field Provides a forum where philosophers and scientists interact Comprehensive reference source on the history of logic Strategic Adoption of Technological Innovations brings together research from practitioners on the development, use, and importance of information technology in order to achieve organizational performance. This comprehensive collection is useful for academicians, scholars, researchers and other industry professionals to provide an understanding of strategy and use of information systems in organizations and entities. This book showcases the strengths of Linear Programming models for Cyber Physical Systems (CPS), such as the Smart Grids. Cyber-Physical Systems (CPS) consist of computational components interconnected by computer networks that monitor and control switched physical entities interconnected by physical infrastructures. A fundamental challenge in the design and analysis of CPS is the lack of understanding in formulating constraints for complex networks. We address this challenge by employing collection of Linear programming solvers that models the constraints of sub-systems and micro grids in a distributed fashion. The book can be treated as a useful resource to adaptively schedule resource transfers between nodes in a smart power grid. In addition, the feasibility conditions and

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constraints outlined in the book will enable in reaching optimal values that can help maintain the stability of both the computer network and the physical systems. It details the collection of optimization methods that are reliable for electric-utilities to use for resource scheduling, and optimizing their existing systems or sub-systems. The authors answer to key questions on ways to optimally allocate resources during outages, and contingency cases (e.g., line failures, and/or circuit breaker failures), how to design de-centralized methods for carrying out tasks using decomposition models; and how to quantify un-certainty and make decisions in the event of grid failures.

This volume tackles a quickly-evolving field of inquiry, mapping the existing discourse as part of a general attempt to place current developments in historical context; at the same time, breaking new ground in taking on novel subjects and pursuing fresh approaches. The term "A.I." is used to refer to a broad range of phenomena, from machine learning and data mining to artificial general intelligence. The recent advent of more sophisticated AI systems, which function with partial or full autonomy and are capable of tasks which require learning and 'intelligence', presents difficult ethical questions, and has drawn concerns from many quarters about individual and societal welfare, democratic decision-making, moral agency, and the prevention of harm. This work ranges from explorations of normative constraints on specific applications of machine learning algorithms today-in everyday medical practice, for instance-to reflections on the (potential) status of AI as a

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form of consciousness with attendant rights and duties and, more generally still, on the conceptual terms and frameworks necessarily to understand tasks requiring intelligence, whether "human" or "A.I."

This volume aims to provide a collection of unique perspectives on the issues surrounding the management of information technology in organizations around the world and the ways in which these issues are addressed. Written by specialists in teaching computer animation, this text addresses key international topics of computer animation, such as: mathematics, modelling, rendering, and compositing. Each chapter discusses a particular topic and how it is applied, including state-of-the-art techniques that are used in computer animation. The handbook provides a complete and up-to-date picture of computer animation and will be a valuable reference source for programmers, technical directors and animators in computer animation, computer games and special effects and also undergraduate and postgraduate students. The editor, John Vince, has written and edited over 20 books on computer graphics, computer animation and virtual reality.

Quantum robotics is an emerging engineering and scientific research discipline that explores the application of quantum mechanics, quantum computing, quantum algorithms, and related fields to robotics. This work broadly surveys advances in our scientific understanding and engineering of quantum mechanisms and how these developments are expected to impact the technical capability for robots to sense, plan, learn, and act in a dynamic environment. It also discusses the new technological potential that quantum approaches may unlock for sensing and control, especially for exploring and

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manipulating quantum-scale environments. Finally, the work surveys the state of the art in current implementations, along with their benefits and limitations, and provides a roadmap for the future.

All model parameters are fundamentally coupled together, so that directly measured individual parameters, although widely used and accepted, may initially only serve as good estimates. This comprehensive resource presents all aspects concerning the modeling of semiconductor field-effect device parameters based on gallium-arsenide (GaAs) and gallium nitride (GaN) technology. Metal-semiconductor field-effect transistors (MESFETs), high electron mobility transistors (HEMTs) and heterojunction bipolar transistors (HBTs), their structures and functions, and existing transistor models are also classified. The Shockley model is presented in order to give insight into semiconductor field-effect transistor (FET) device physics and explain the relationship between geometric and material parameters and device performance. Extraction of trapping and thermal time constants is discussed. A special section is devoted to standard nonlinear FET models applied to large-signal measurements, including static-/pulsed-DC and single-/two-tone stimulation. High power measurement setups for signal waveform measurement, wideband source-/load-pull measurement (including envelope source-/load pull) are also included, along with high-power intermodulation distortion (IMD) measurement setup (including envelope load-pull). Written by a world-renowned expert in the field, this book is the first to cover of all aspects of semiconductor FET device modeling in a single volume.

As Artificial Intelligence (AI) technologies rapidly progress, questions about the ethics of AI, in both the near-future and the long-term, become more pressing than ever. This volume features seventeen original essays by prominent AI scientists

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and philosophers and represents the state-of-the-art thinking in this fast-growing field. Organized into four sections, this volume explores the issues surrounding how to build ethics into machines; ethical issues in specific technologies, including self-driving cars, autonomous weapon systems, surveillance algorithms, and sex robots; the long term risks of superintelligence; and whether AI systems can be conscious or have rights. Though the use and practical applications of AI are growing exponentially, discussion of its ethical implications is still in its infancy. This volume provides an invaluable resource for thinking through the ethical issues surrounding AI today and for shaping the study and development of AI in the coming years.

Encyclopedia of Bioinformatics and Computational Biology: ABC of Bioinformatics combines elements of computer science, information technology, mathematics, statistics and biotechnology, providing the methodology and in silico solutions to mine biological data and processes. The book covers Theory, Topics and Applications, with a special focus on Integrative –omics and Systems Biology. The theoretical, methodological underpinnings of BCB, including phylogeny are covered, as are more current areas of focus, such as translational bioinformatics, cheminformatics, and environmental informatics. Finally, Applications provide guidance for commonly asked questions. This major reference work spans basic and cutting-edge methodologies authored by leaders in the field, providing an invaluable resource for students, scientists, professionals in research institutes, and a broad swath of researchers in biotechnology and the biomedical and pharmaceutical industries. Brings together information from computer science, information technology, mathematics, statistics and biotechnology Written and reviewed by leading experts in the field, providing a unique and authoritative resource Focuses on the main

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theoretical and methodological concepts before expanding on specific topics and applications Includes interactive images, multimedia tools and crosslinking to further resources and databases

This practical resource highlights the systematic problems Internet of Things is encountering on its journey to mass adoption. Professionals are offered solutions to key questions about IoT systems today, including potential network scalability issues, storage, and computing. Security and privacy are explored and the value of sensor-collected data is explained. Costs of deployment and transformation are covered and the model-driven deployment of IoT systems is explored. Presenting a pragmatic real-world approach to IoT, this book covers technology components such as communication, computing, storage and mobility, as well as business insights and social implications.

This book focuses on the latest applications of nonlinear approaches in engineering and addresses a range of scientific problems. Examples focus on issues in automotive technology, including automotive dynamics, control for electric and hybrid vehicles, and autodriver algorithm for autonomous vehicles. Also included are discussions on renewable energy plants, data modeling, driver-aid methods, and low-frequency vibration. Chapters are based on invited contributions from world-class experts who advance the future of engineering by discussing the development of more optimal, accurate, efficient, cost, and energy effective systems. This book is appropriate for researchers, students, and practising engineers who are interested in the applications of nonlinear approaches to solving engineering and science problems. Presents a broad range of practical topics and approaches; Explains approaches to better, safer, and cheaper systems; Emphasises automotive applications, physical meaning, and methodologies.

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This volume is the first systematic and thorough attempt to investigate the relation and the possible applications of mereology to contemporary science. It gathers contributions from leading scholars in the field and covers a wide range of scientific theories and practices such as physics, mathematics, chemistry, biology, computer science and engineering. Throughout the volume, a variety of foundational issues are investigated both from the formal and the empirical point of view. The first section looks at the topic as it applies to physics. The section addresses questions of persistence and composition within quantum and relativistic physics and concludes by scrutinizing the possibility to capture continuity of motion as described by our best physical theories within gunky space times. The second part tackles mathematics and shows how to provide a foundation for point-free geometry of space switching to fuzzy-logic. The relation between mereological sums and set-theoretic suprema is investigated and issues about different mereological perspectives such as classical and natural Mereology are thoroughly discussed. The third section in the volume looks at natural science. Several questions from biology, medicine and chemistry are investigated. From the perspective of biology, there is an attempt to provide axioms for inferring statements about part hood between two biological entities from statements about their spatial relation. From the perspective of chemistry, it is argued that classical mereological frameworks are not adequate to capture the practices of chemistry in that they consider neither temporal nor modal parameters. The final part introduces computer science and engineering. A new formal mereological framework in which an indeterminate relation of part hood is taken as a primitive notion is constructed and then applied to a wide variety of disciplines from robotics to knowledge engineering. A formal framework for discrete mereotopology and its applications is developed

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and finally, the importance of mereology for the relatively new science of domain engineering is also discussed.

BIG DATA ANALYTICS FOR INTERNET OF THINGS

Discover the latest developments in IoT Big Data with a new resource from established and emerging leaders in the field. Big Data Analytics for Internet of Things delivers a comprehensive overview of all aspects of big data analytics in Internet of Things (IoT) systems. The book includes discussions of the enabling technologies of IoT data analytics, types of IoT data analytics, challenges in IoT data analytics, demand for IoT data analytics, computing platforms, analytical tools, privacy, and security. The distinguished editors have included resources that address key techniques in the analysis of IoT data. The book demonstrates how to select the appropriate techniques to unearth valuable insights from IoT data and offers novel designs for IoT systems. With an abiding focus on practical strategies with concrete applications for data analysts and IoT professionals, Big Data Analytics for Internet of Things also offers readers: A thorough introduction to the Internet of Things, including IoT architectures, enabling technologies, and applications An exploration of the intersection between the Internet of Things and Big Data, including IoT as a source of Big Data, the unique characteristics of IoT data, etc. A discussion of the IoT data analytics, including the data analytical requirements of IoT data and the types of IoT analytics, including predictive, descriptive, and prescriptive analytics A treatment of machine learning techniques for IoT data analytics Perfect for professionals, industry practitioners, and researchers engaged in big data analytics related to IoT systems, Big Data Analytics for Internet of Things will also earn a place in the libraries of IoT designers and manufacturers interested in facilitating the efficient implementation of data analytics strategies.

