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KEY=INTELLIGENCE - KEENAN EATON

SYSTEMS ENGINEERING AND ARTIFICIAL INTELLIGENCE

Springer This book provides a broad overview of the benefits from a Systems Engineering design philosophy in architecting complex systems composed of artificial intelligence (AI), machine learning (ML) and humans situated in chaotic environments. The major topics include emergence, verification and validation of systems using AI/ML and human systems integration to develop robust and effective human-machine teams—where the machines may have varying degrees of autonomy due to the sophistication of their embedded AI/ML. The chapters not only describe what has been learned, but also raise questions that must be answered to further advance the general Science of Autonomy. The science of how humans and machines operate as a team requires insights from, among others, disciplines such as the social sciences, national and international jurisprudence, ethics and policy, and sociology and psychology. The social sciences inform how context is constructed, how trust is affected when humans and machines depend upon each other and how human-machine teams need a shared language of explanation. National and international jurisprudence determine legal responsibilities of non-trivial human-machine failures, ethical standards shape global policy, and sociology provides a basis for understanding team norms across cultures. Insights from psychology may help us to understand the negative impact on humans if AI/ML based machines begin to outperform their human teammates and consequently diminish their value or importance. This book invites professionals and the curious alike to witness a new frontier open as the Science of Autonomy emerges.

SYSTEMS ENGINEERING AND ARTIFICIAL INTELLIGENCE

Springer Nature

MACHINE LEARNING AND SYSTEMS ENGINEERING

Springer Science & Business Media A large international conference on Advances in Machine Learning and Systems Engineering was held in UC Berkeley, California, USA, October 20-22, 2009, under the auspices of the World Congress on Engineering and Computer Science (WCECS 2009). Machine Learning and Systems Engineering contains forty-six 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. Machine Learning and Systems Engineering offers the state of the art of tremendous advances in machine learning and systems engineering and also serves as an excellent reference text for researchers and graduate students, working on machine learning and systems engineering.

APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN PROCESS SYSTEMS ENGINEERING

Elsevier Applications of Artificial Intelligence in Process Systems Engineering offers a broad perspective on the issues related to artificial intelligence technologies and their applications in chemical and process engineering. The book comprehensively introduces the methodology and applications of AI technologies in process systems engineering, making it an indispensable reference for researchers and students. As chemical processes and systems are usually non-linear and complex, thus making it challenging to apply AI

methods and technologies, this book is an ideal resource on emerging areas such as cloud computing, big data, the industrial Internet of Things and deep learning. With process systems engineering's potential to become one of the driving forces for the development of AI technologies, this book covers all the right bases. Explains the concept of machine learning, deep learning and state-of-the-art intelligent algorithms Discusses AI-based applications in process modeling and simulation, process integration and optimization, process control, and fault detection and diagnosis Gives direction to future development trends of AI technologies in chemical and process engineering

INTELLIGENT SYSTEMS FOR ENGINEERS AND SCIENTISTS, THIRD EDITION

CRC Press 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 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/

ARTIFICIAL INTELLIGENCE AND DIGITAL SYSTEMS ENGINEERING

CRC Press The resurgence of artificial intelligence has been fueled by the availability of the present generation of high-performance computational tools and techniques. This book is designed to provide introductory guidance to artificial intelligence, particularly from the perspective of digital systems engineering. Artificial Intelligence and Digital Systems Engineering provides a general introduction to the origin of AI and covers the wide application areas and software and hardware interfaces. It will prove to be instrumental in helping new users expand their knowledge horizon to the growing market of AI tools, as well as showing how AI is applicable to the development of games, simulation, and consumer products, particularly using artificial neural networks. This book is for the general reader, university students, and instructors of industrial, production, civil, mechanical, and manufacturing engineering. It will also be of interest to managers of technology, projects, business, plants, and operations.

ENGINEERING ARTIFICIALLY INTELLIGENT SYSTEMS

A SYSTEMS ENGINEERING APPROACH TO REALIZING SYNERGISTIC CAPABILITIES

Springer Nature Many current AI and machine learning algorithms and data and information fusion processes attempt in software to estimate situations in our complex world of nested feedback loops. Such algorithms and processes must gracefully and efficiently adapt to technical challenges such as data quality induced by these loops, and interdependencies that vary in complexity, space, and time. To realize effective and efficient designs of computational systems, a Systems Engineering perspective may provide a framework for identifying the interrelationships and patterns of change between components rather than static snapshots. We must study cascading interdependencies through this perspective to understand their behavior and to successfully adopt complex system-of-systems in society. This book derives in part from the presentations given at the AAAI 2021 Spring Symposium session on Leveraging Systems Engineering to Realize Synergistic AI / Machine Learning Capabilities. Its 16 chapters offer an emphasis on pragmatic aspects and address topics in systems engineering; AI, machine learning, and reasoning; data and information fusion; intelligent systems; autonomous systems; interdependence and teamwork; human-computer interaction; trust; and resilience.

ENGINEERING INTELLIGENT SYSTEMS

SYSTEMS ENGINEERING AND DESIGN WITH ARTIFICIAL INTELLIGENCE, VISUAL MODELING AND SYSTEMS THINKING

John Wiley & Sons Exploring the three key disciplines of intelligent systems As artificial intelligence (AI) and machine learning technology continue to develop and find new applications, advances in this field have generally been focused on the development of isolated software data analysis systems or of control systems for robots and other devices. By applying model-based systems engineering to AI, however, engineers can design complex systems that rely on AI-based components, resulting in a larger, more complex intelligent systems that more successfully integrate humans and AI. Engineering Intelligent Systems relies on Dr. Barclay Brown's 25 years of experience in software and systems engineering to propose an integrated perspective to the challenges and opportunities in the use of artificial intelligence to create better technological and business systems. While most recent research on the topic has focused on adapting and improving algorithms and devices, this book puts forth the innovative idea of transforming the systems in our lives, our societies, and our businesses into intelligent systems. At its heart, this book is about how to combine systems engineering and systems thinking with the newest technologies to design increasingly intelligent systems. Engineering Intelligent Systems readers will also find: An introduction to the fields of artificial intelligence with machine learning, model-based systems engineering (MBSE), and systems thinking—the key disciplines for making systems smarter An example of how to build a deep neural network in a spreadsheet, with no code or specialized mathematics required An approach to the visual representation of systems, using techniques from moviemaking, storytelling, visual systems design, and model-based systems engineering An analysis of the potential ability of computers to think, understand and become conscious and its implications for artificial intelligence Tools to allow for easier collaboration and communication among developers and engineers, allowing for better understanding between stakeholders, and creating a faster development cycle A systems thinking approach to people systems—systems that consist only of people and which form the basis for our organizations, communities and society. Engineering Intelligent Systems offers an intriguing new approach to making systems more intelligent using artificial intelligence, machine learning, systems thinking, and system modeling and therefore will be of interest to all engineers and business professionals, particularly systems engineers.

ENGINEERING ARTIFICIALLY INTELLIGENT SYSTEMS

A SYSTEMS ENGINEERING APPROACH TO REALIZING SYNERGISTIC CAPABILITIES

Springer Many current AI and machine learning algorithms and data and information fusion processes attempt in software to estimate situations in our complex world of nested feedback loops. Such algorithms and processes must gracefully and efficiently adapt to technical challenges such as data quality induced by these loops, and interdependencies that vary in complexity, space, and time. To realize effective and efficient designs of computational systems, a Systems Engineering perspective may provide a framework for identifying the interrelationships and patterns of change between components rather than static snapshots. We must study cascading interdependencies through this perspective to understand their behavior and to successfully adopt complex system-of-systems in society. This book derives in part from the presentations given at the AAAI 2021 Spring Symposium session on Leveraging Systems Engineering to Realize Synergistic AI / Machine Learning Capabilities. Its 16 chapters offer an emphasis on pragmatic aspects and address topics in systems engineering; AI, machine learning, and reasoning; data and information fusion; intelligent systems; autonomous systems; interdependence and teamwork; human-computer interaction; trust; and resilience.

INTELLIGENT-BASED SYSTEMS ENGINEERING

Springer Science & Business Media The International Council on Systems Engineering (INCOSE) defines Systems Engineering as an interdisciplinary approach and means to enable the realization of successful systems. Researchers are using intelligence-based techniques to support the practices of systems engineering in an innovative way. This research volume includes a selection of contributions by subject experts to design better systems.

INTELLIGENT CONTROL SYSTEMS WITH AN INTRODUCTION TO SYSTEM OF SYSTEMS ENGINEERING

CRC Press From aeronautics and manufacturing to healthcare and disaster management, systems engineering (SE) now focuses on designing applications that ensure performance optimization, robustness, and reliability while combining an emerging group of heterogeneous systems to realize a common goal. Use SoS to Revolutionize Management of Large Organizations, Factories, and Systems Intelligent Control Systems with an Introduction to System of Systems Engineering integrates the fundamentals of artificial intelligence and systems control in a framework applicable to both simple dynamic systems and large-scale system of systems (SoS). For decades, NASA has used SoS methods, and major manufacturers—including Boeing, Lockheed-Martin, Northrop-Grumman, Raytheon, BAE Systems—now make large-scale systems integration and SoS a key part of their business

strategies, dedicating entire business units to this remarkably efficient approach. Simulate Novel Robotic Systems and Applications Transcending theory, this book offers a complete and practical review of SoS and some of its fascinating applications, including: Manipulation of robots through neural-based network control Use of robotic swarms, based on ant colonies, to detect mines Other novel systems in which intelligent robots, trained animals, and humans cooperate to achieve humanitarian objectives Training engineers to integrate traditional systems control theory with soft computing techniques further nourishes emerging SoS technology. With this in mind, the authors address the fundamental precepts at the core of SoS, which uses human heuristics to model complex systems, providing a scientific rationale for integrating independent, complex systems into a single coordinated, stabilized, and optimized one. They provide readers with MATLAB® code, which can be downloaded from the publisher's website to simulate presented results and projects that offer practical, hands-on experience using concepts discussed throughout the book.

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS FOR ENGINEERS

CRC Press This book provides a comprehensive presentation of artificial intelligence (AI) methodologies and tools valuable for solving a wide spectrum of engineering problems. What's more, it offers these AI tools on an accompanying disk with easy-to-use software. Artificial Intelligence and Expert Systems for Engineers details the AI-based methodologies known as: Knowledge-Based Expert Systems (KBES); Design Synthesis; Design Critiquing; and Case-Based Reasoning. KBES are the most popular AI-based tools and have been successfully applied to planning, diagnosis, classification, monitoring, and design problems. Case studies are provided with problems in engineering design for better understanding of the problem-solving models using the four methodologies in an integrated software environment. Throughout the book, examples are given so that students and engineers can acquire skills in the use of AI-based methodologies for application to practical problems ranging from diagnosis to planning, design, and construction and manufacturing in various disciplines of engineering. Artificial Intelligence and Expert Systems for Engineers is a must-have reference for students, teachers, research scholars, and professionals working in the area of civil engineering design in particular and engineering design in general.

INDUSTRIAL AND ENGINEERING APPLICATIONS OF ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

PROCEEDINGS OF THE TENTH INTERNATIONAL CONFERENCE

CRC Press The field of artificial intelligence has been maturing for a number of years and has inspired many researchers to produce innovative intelligent systems to demonstrate the capability of intelligent machines and their success in solving human problems. Only recently, however, have intelligent systems shown progress in demonstrating success in real-life applications, particularly in industrial environments. Many organizations have successfully used at least some limited aspects of intelligent research in their day-to-day operations. The objectives of this volume are to focus on these real-life applications and report a comprehensive view of the theoretical and applied aspects of intelligent systems technology. The most recent work in industrial, commercial, military, and academic environments is summarized, including 61 state-of-the-art reports on active research applied to real world problems.

A FRAMEWORK OF HUMAN SYSTEMS ENGINEERING

APPLICATIONS AND CASE STUDIES

John Wiley & Sons Explores the breadth and versatility of Human Systems Engineering (HSE) practices and illustrates its value in system development A Framework of Human Systems Engineering: Applications and Case Studies offers a guide to identifying and improving methods to integrate human concerns into the conceptualization and design of systems. With contributions from a panel of noted experts on the topic, the book presents a series of Human Systems Engineering (HSE) applications on a wide range of topics: interface design, training requirements, personnel capabilities and limitations, and human task allocation. Each of the book's chapters present a case study of the application of HSE from different dimensions of socio-technical systems. The examples are organized using a socio-technical system framework to reference the applications across multiple system types and domains. These case studies are based in real-world examples and highlight the value of applying HSE to the broader engineering community. This important book: Includes a proven framework with case studies to different dimensions of practice, including domain, system type, and system maturity Contains the needed tools and methods in order to integrate human concerns within systems Encourages the use of Human Systems Engineering throughout the design process Provides examples that cross traditional system engineering sectors and identifies a diverse set of human engineering practices Written for systems engineers, human factors engineers, and HSI practitioners, A Framework of Human Systems Engineering: Applications and Case Studies provides the information needed for the better integration of human and systems and early resolution of issues based

on human constraints and limitations.

ARTIFICIAL INTELLIGENCE AND EVOLUTIONARY COMPUTATIONS IN ENGINEERING SYSTEMS

PROCEEDINGS OF ICAIECES 2017

Springer The book is a collection of high-quality peer-reviewed research papers presented in the International Conference on Artificial Intelligence and Evolutionary Computations in Engineering Systems (ICAIECES 2017). The book discusses wide variety of industrial, engineering and scientific applications of the emerging techniques. Researchers from academia and industry have presented their original work and ideas, information, techniques and applications in the field of communication, computing and power technologies.

ADVANCES IN SYSTEMS ENGINEERING

PROCEEDINGS OF THE 28TH INTERNATIONAL CONFERENCE ON SYSTEMS ENGINEERING, ICSENG 2021, DECEMBER 14–16, WROCŁAW, POLAND

Springer Nature

INTELLIGENT ROBOTIC SYSTEMS

DESIGN, PLANNING, AND CONTROL

Springer Science & Business Media Here is a comprehensive presentation of methodology for the design and synthesis of an intelligent complex robotic system, connecting formal tools from discrete system theory, artificial intelligence, neural network, and fuzzy logic. The necessary methods for solving real time action planning, coordination and control problems are described. A notable chapter presents a new approach to intelligent robotic agent control acting in a realworld environment based on a lifelong learning approach combining cognitive and reactive capabilities. Another key feature is the homogeneous description of all solutions and methods based on system theory formalism.

PREDICTIVE MODELLING FOR ENERGY MANAGEMENT AND POWER SYSTEMS ENGINEERING

Elsevier Predictive Modeling for Energy Management and Power Systems Engineering introduces readers to the cutting-edge use of big data and large computational infrastructures in energy demand estimation and power management systems. The book supports engineers and scientists who seek to become familiar with advanced optimization techniques for power systems designs, optimization techniques and algorithms for consumer power management, and potential applications of machine learning and artificial intelligence in this field. The book provides modeling theory in an easy-to-read format, verified with on-site models and case studies for specific geographic regions and complex consumer markets. Presents advanced optimization techniques to improve existing energy demand system Provides data-analytic models and their practical relevance in proven case studies Explores novel developments in machine-learning and artificial intelligence applied in energy management Provides modeling theory in an easy-to-read format

ARTIFICIAL INTELLIGENCE, COMPUTER AND SOFTWARE ENGINEERING ADVANCES

PROCEEDINGS OF THE CIT 2020 VOLUME 1

Springer Nature This book constitutes the proceedings of the XV Multidisciplinary International Congress on Science and Technology (CIT 2020), held in Quito, Ecuador, on 26–30 October 2020, proudly organized by Universidad de las Fuerzas Armadas ESPE in collaboration with GDEON. CIT is an international event with a multidisciplinary approach that promotes the dissemination of advances in Science and Technology research through the presentation of keynote conferences. In CIT, theoretical, technical, or application works that are research products are presented to discuss and debate ideas, experiences, and challenges. Presenting high-quality, peer-reviewed papers, the book discusses the following topics: Artificial Intelligence Computational Modeling Data Communications Defense Engineering Innovation, Technology, and Society Managing Technology & Sustained Innovation, and Business Development Modern Vehicle Technology Security and Cryptography Software Engineering

BUILDING INTELLIGENT SYSTEMS

A GUIDE TO MACHINE LEARNING ENGINEERING

Apress Produce a fully functioning Intelligent System that leverages machine learning and data from user interactions to improve over time and achieve success. This book teaches you how to build an Intelligent System from end to end and leverage machine learning in practice. You will understand how to apply your existing skills in software engineering, data science, machine learning, management, and program management to produce working systems. Building Intelligent Systems is based on more than a decade of experience building Internet-scale Intelligent Systems that have hundreds of millions of user interactions per day in some of the largest and most important software systems in the world. What You'll Learn Understand the concept of an Intelligent System: What it is good for, when you need one, and how to set it up for success Design an intelligent user experience: Produce data to help make the Intelligent System better over time Implement an Intelligent System: Execute, manage, and measure Intelligent Systems in practice Create intelligence: Use different approaches, including machine learning Orchestrate an Intelligent System: Bring the parts together throughout its life cycle and achieve the impact you want Who This Book Is For Software engineers, machine learning practitioners, and technical managers who want to build effective intelligent systems

ARTIFICIAL INTELLIGENCE AND DIGITAL SYSTEMS ENGINEERING

CRC Press The resurgence of artificial intelligence has been fueled by the availability of the present generation of high-performance computational tools and techniques. This book is designed to provide introductory guidance to artificial intelligence, particularly from the perspective of digital systems engineering. Artificial Intelligence and Digital Systems Engineering provides a general introduction to the origin of AI and covers the wide application areas and software and hardware interfaces. It will prove to be instrumental in helping new users expand their knowledge horizon to the growing market of AI tools, as well as showing how AI is applicable to the development of games, simulation, and consumer products, particularly using artificial neural networks. This book is for the general reader, university students, and instructors of industrial, production, civil, mechanical, and manufacturing engineering. It will also be of interest to managers of technology, projects, business, plants, and operations.

ARTIFICIAL INTELLIGENCE IN PROCESS ENGINEERING

Elsevier Artificial Intelligence in Process Engineering aims to present a diverse sample of Artificial Intelligence (AI) applications in process engineering. The book contains contributions, selected by the editors based on educational value and diversity of AI methods and process engineering application domains. Topics discussed in the text include the use of qualitative reasoning for modeling and simulation of chemical systems; the use of qualitative models in discrete event simulation to analyze malfunctions in processing systems; and the diagnosis of faults in processes that are controlled by Programmable Logic Controllers. There are also debates on the issue of quantitative versus qualitative information. The control of batch processes, a design of a system that synthesizes bioseparation processes, and process design in the domain of chemical (rather than biochemical) systems are likewise covered in the text. This publication will be of value to industrial engineers and process engineers and researchers.

ADVANCES IN ARTIFICIAL SYSTEMS FOR POWER ENGINEERING

Springer Nature This book comprises refereed papers presented at The International Conference on Artificial Intelligence and Power Engineering (AIPE2020), held in Moscow, Russia, on December 25–27, 2020. The book's/conference's general scope covers the latest advances for the development of artificial intelligence systems and their applications in various fields from power engineering to biology and education. Given the rapid development of artificial intelligence systems, the book emphasizes the need for the intensification of training of a growing number of relevant specialists, in particular, in energy and power engineering to increase the effectiveness of creation and diagnosing of appropriate technical solutions. In digital artificial intelligence systems, scientists endeavor to reproduce the innate intellectual abilities of humans and other organisms. The in-depth study of biological and self-organizing systems provides new approaches to create more and more effective artificial intelligence methods. Topics of the included papers concern thematic materials in the following spheres: mathematics and computer algorithms; analysis of some technical solutions; technological and educational approaches. The book is a compilation of state-of-the-art papers in the field, covering a comprehensive range of subjects that are relevant to business managers and engineering professionals alike. The breadth and depth of these proceedings make them an excellent resource for asset management practitioners, researchers, and academics, as well as undergraduate and postgraduate students interested in artificial intelligence systems and their growing applications. The intended readership includes specialists, students, and other circles of readers who would like to know where artificial intelligence systems can be applied in the future with great benefit.

EMERGING ARTIFICIAL INTELLIGENCE APPLICATIONS IN COMPUTER ENGINEERING

REAL WORD AI SYSTEMS WITH APPLICATIONS IN EHEALTH, HCI, INFORMATION RETRIEVAL AND PERVASIVE TECHNOLOGIES

IOS Press "The ever expanding abundance of information and computing power enables researchers and users to tackle highly interesting issues for the first time, such as applications providing personalized access and interactivity to multimodal information based on user preferences and semantic concepts or human-machine interface systems utilizing information on the affective state of the user. The purpose of this book is to provide insights on how todays computer engineers can implement AI in real world applications. Overall, the field of artificial intelligence is extremely broad. In essence, AI has found applications, in one way or another, in every aspect of computing and in most aspects of modern life. Consequently, it is not possible to provide a complete review of the field in the framework of a single book, unless if the review is broad rather than deep. In this book we have chosen to present selected current and emerging practical applications of AI, thus allowing for a more detailed presentation of topics. The book is organized in four parts; General Purpose Applications of AI; Intelligent Human-Computer Interaction; Intelligent Applications in Signal Processing and eHealth; and Real world AI applications in Computer Engineering."

ADVANCED INFORMATION SYSTEMS ENGINEERING

29TH INTERNATIONAL CONFERENCE, CAISE 2017, ESSEN, GERMANY, JUNE 12-16, 2017, PROCEEDINGS

Springer This book constitutes the refereed proceedings of the 29th International Conference on Advanced Information Systems Engineering, CAiSE 2017, held in Essen, Germany, in June 2017. The 37 papers presented together with 3 keynote papers in this volume were carefully reviewed and selected from 175 submissions. The papers are organized in topical sections on information systems architecture; business process alignment; user knowledge discovery; business process performance; big data exploration; process variability management; information systems transformation and evolution; business process modeling readability; business process adaption; data mining; process discovery; business process modeling notation.

COGNITIVE SYSTEMS ENGINEERING

THE FUTURE FOR A CHANGING WORLD

CRC Press This volume provides an exceptional perspective on the nature, evolution, contributions and future of the field of Cognitive Systems Engineering (CSE). It is a resource to support both the teaching and practice of CSE. It accomplishes this through its organization into two complementary approaches to the topic. The first is an historical perspective: In the retrospections of leaders of the field, what have been the seminal achievements of cognitive human factors? What are the "lessons learned" that became foundational to CSE, and how did that foundation evolve into a broader systems view of cognitive work? The second perspective is both pedagogical and future-looking: What are the major conceptual issues that have to be addressed by CSE and how can a new generation of researchers be prepared to further advance CSE? Topics include studies of expertise, cognitive work analysis, cognitive task analysis, human performance, system design, cognitive modeling, decision making, human-computer interaction, trust in automation, teamwork and ecological interface design. A thematic focus will be on systems-level analysis, and such notions as resilience engineering and systems-level measurement. The book features broad coverage of many of the domains to which CSE is being applied, among them industrial process control, health care, decision aiding and aviation human factors. The book's contributions are provided by an extraordinary group of leaders and pathfinders in applied psychology, cognitive science, systems analysis and system design. In combination these chapters present invaluable insights, experiences and continuing uncertainties on the subject of the field of CSE, and in doing so honor the career and achievements of Professor David D. Woods of Ohio State University.

ARTIFICIAL INTELLIGENCE AND EVOLUTIONARY COMPUTATIONS IN ENGINEERING SYSTEMS

Springer Nature This book gathers selected papers presented at the 4th International Conference on Artificial Intelligence and Evolutionary Computations in Engineering Systems, held at the SRM Institute of Science and Technology, Kattankulathur, Chennai, India, from 11 to 13 April 2019. It covers advances and recent developments in various computational intelligence techniques, with an emphasis on the design of communication systems. In addition, it shares valuable insights into advanced computational methodologies such as

neural networks, fuzzy systems, evolutionary algorithms, hybrid intelligent systems, uncertain reasoning techniques, and other machine learning methods and their application to decision-making and problem-solving in mobile and wireless communication networks.

ENGINEERING MULTI-AGENT SYSTEMS

4TH INTERNATIONAL WORKSHOP, EMAS 2016, SINGAPORE, SINGAPORE, MAY 9-10, 2016, REVISED, SELECTED, AND INVITED PAPERS

Springer This book constitutes revised, selected, and invited papers from the 4th International Workshop on Engineering Multi-Agent Systems, EMAS 2016, held in Singapore, in May 2016, in conjunction with AAMAS. The 10 full papers presented in this volume were carefully reviewed and selected from 14 submissions. The book also contains 2 invited papers; extended versions of AAMAS 2016 demonstration abstracts. EMAS deals with MAS software engineering processes, methodologies and techniques; Programming languages for MAS; Formal methods and declarative technologies for the specification, validation and verification of MAS; and development tools.

APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN ENGINEERING

PROCEEDINGS OF FIRST GLOBAL CONFERENCE ON ARTIFICIAL INTELLIGENCE AND APPLICATIONS (GCAIA 2020)

Springer Nature This book presents best selected papers presented at the First Global Conference on Artificial Intelligence and Applications (GCAIA 2020), organized by the University of Engineering & Management, Jaipur, India, during 8–10 September 2020. The proceeding will be targeting the current research works in the domain of intelligent systems and artificial intelligence.

ARTIFICIAL INTELLIGENCE AND SOFTWARE ENGINEERING

Routledge First published in 1998. Routledge is an imprint of Taylor & Francis, an informa company.

SMART AND INTELLIGENT SYSTEMS

THE HUMAN ELEMENTS IN ARTIFICIAL INTELLIGENCE, ROBOTICS, AND CYBERSECURITY

CRC Press "The more we know about smart and intelligent systems and their use, the more productive organizations can become, and the more quality of life will improve."—Gavriel Salvendy, President Academy of Science, Engineering and Medicine of Florida, University Distinguished Professor University of Central Florida" "Robots, drones, self-driving cars, and personal assistants are only some of the 'intelligent' and 'smart' systems which are populating our world and changing the way we use technology to carry out our everyday activities, bringing about both exciting opportunities for human-technology symbiosis, as well as compelling design and development challenges. Through a carefully selected choice of chapters, authored by top scientists in the field, this book, edited by Abbas Moallem, sheds light on fundamental aspects of intelligent and smart systems, investigating the role and impact of affective and psychophysiological computing, machine learning, cybersecurity, agent transparency, and human-agent teaming in the shaping of this new interaction paradigm, as well as the human factors involved in their application in critical domains such as health, education, and manufacturing in the emerging technological landscape."—Constantine Stephanidis, Professor of Computer Science, University of Crete, Distinguished member of Foundation for Research and Technology - Hellas (FORTH) In today's digital world, the words "smart" and intelligent" are now used to label devices, machinery, systems, and even environments. What is a "smart" system? Is "smart" synonymous with "intelligent"? If not, what does an "intelligent system" mean? Are all smart systems intelligent? This book tries to answer these questions by summarizing the existing research in various areas and providing new research findings. Smart and Intelligent Systems: The Human Elements in Artificial Intelligence, Robotics, and Cybersecurity presents new areas of smart and intelligent system design. It defines smart and intelligent systems, offers a human factors approach, discusses networking applications, and combines the human element with smart and intelligent systems. This book is perfect for engineering students in data sciences and artificial intelligence and practitioners at all levels in the fields of human factors and ergonomics, systems engineering, computer science, software engineering, and robotics.

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

Mercury Learning and Information This book is designed to identify some of the current applications and techniques of artificial intelligence as an aid to solving problems and

accomplishing tasks. It provides a general introduction to the various branches of AI which include formal logic, reasoning, knowledge engineering, expert systems, neural networks, and fuzzy logic, etc. The book has been structured into five parts with an emphasis on expert systems: problems and state space search, knowledge engineering, neural networks, fuzzy logic, and Prolog. Features: Introduces the various branches of AI which include formal logic, reasoning, knowledge engineering, expert systems, neural networks, and fuzzy logic, etc. Includes a separate chapter on Prolog to introduce basic programming techniques in AI

ARTIFICIAL INTELLIGENCE AND EVOLUTIONARY COMPUTATIONS IN ENGINEERING SYSTEMS

PROCEEDINGS OF ICAIECES 2015

Springer The book is a collection of high-quality peer-reviewed research papers presented in the first International Conference on International Conference on Artificial Intelligence and Evolutionary Computations in Engineering Systems (ICAIECES -2015) held at Velammal Engineering College (VEC), Chennai, India during 22 – 23 April 2015. The book discusses wide variety of industrial, engineering and scientific applications of the emerging techniques. Researchers from academic and industry present their original work and exchange ideas, information, techniques and applications in the field of Communication, Computing and Power Technologies.

TRUSTWORTHY CYBER-PHYSICAL SYSTEMS ENGINEERING

CRC Press From the Foreword "Getting CPS dependability right is essential to forming a solid foundation for a world that increasingly depends on such systems. This book represents the cutting edge of what we know about rigorous ways to ensure that our CPS designs are trustworthy. I recommend it to anyone who wants to get a deep look at these concepts that will form a cornerstone for future CPS designs." --Phil Koopman, Carnegie Mellon University, Pittsburgh, Pennsylvania, USA Trustworthy Cyber-Physical Systems Engineering provides practitioners and researchers with a comprehensive introduction to the area of trustworthy Cyber Physical Systems (CPS) engineering. Topics in this book cover questions such as What does having a trustworthy CPS actually mean for something as pervasive as a global-scale CPS? How does CPS trustworthiness map onto existing knowledge, and where do we need to know more? How can we mathematically prove timeliness, correctness, and other essential properties for systems that may be adaptive and even self-healing? How can we better represent the physical reality underlying real-world numeric quantities in the computing system? How can we establish, reason about, and ensure trust between CPS components that are designed, installed, maintained, and operated by different organizations, and which may never have really been intended to work together? Featuring contributions from leading international experts, the book contains sixteen self-contained chapters that analyze the challenges in developing trustworthy CPS, and identify important issues in developing engineering methods for CPS. The book addresses various issues contributing to trustworthiness complemented by contributions on TCSP roadmapping, taxonomy, and standardization, as well as experience in deploying advanced system engineering methods in industry. Specific approaches to ensuring trustworthiness, namely, proof and refinement, are covered, as well as engineering methods for dealing with hybrid aspects.

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING FOR BUSINESS FOR NON-ENGINEERS

CRC Press The next big area within the information and communication technology field is Artificial Intelligence (AI). The industry is moving to automate networks, cloud-based systems (e.g., Salesforce), databases (e.g., Oracle), AWS machine learning (e.g., Amazon Lex), and creating infrastructure that has the ability to adapt in real-time to changes and learn what to anticipate in the future. It is an area of technology that is coming faster and penetrating more areas of business than any other in our history. AI will be used from the C-suite to the distribution warehouse floor. Replete with case studies, this book provides a working knowledge of AI's current and future capabilities and the impact it will have on every business. It covers everything from healthcare to warehousing, banking, finance and education. It is essential reading for anyone involved in industry.

ADVANCES IN ARTIFICIAL INTELLIGENCE, SOFTWARE AND SYSTEMS ENGINEERING

PROCEEDINGS OF THE AHFE 2020 VIRTUAL CONFERENCES ON SOFTWARE AND SYSTEMS ENGINEERING, AND ARTIFICIAL INTELLIGENCE AND SOCIAL COMPUTING, JULY 16-20, 2020, USA

Springer This book addresses emerging issues concerning the integration of artificial intelligence systems in our daily lives. It focuses on the cognitive, visual, social and analytical aspects of computing and intelligent technologies, and highlights ways to improve the acceptance, effectiveness, and efficiency of said technologies. Topics such as responsibility,

integration and training are discussed throughout. The book also reports on the latest advances in systems engineering, with a focus on societal challenges and next-generation systems and applications for meeting them. Based on the AHFE 2020 Virtual Conference on Software and Systems Engineering, and the AHFE 2020 Virtual Conference on Artificial Intelligence and Social Computing, held on July 16–20, 2020, it provides readers with extensive information on current research and future challenges in these fields, together with practical insights into the development of innovative services for various purposes.

ARTIFICIAL INTELLIGENCE APPLICATIONS IN ELECTRICAL TRANSMISSION AND DISTRIBUTION SYSTEMS PROTECTION

CRC Press Artificial intelligence (AI) can successfully help in solving real-world problems in power transmission and distribution systems because AI-based schemes are fast, adaptive, and robust and are applicable without any knowledge of the system parameters. This book considers the application of AI methods for the protection of different types and topologies of transmission and distribution lines. It explains the latest pattern-recognition-based methods as applicable to detection, classification, and location of a fault in the transmission and distribution lines, and to manage smart power systems including all the pertinent aspects. FEATURES Provides essential insight on uses of different AI techniques for pattern recognition, classification, prediction, and estimation, exclusive to power system protection issues Presents an introduction to enhanced electricity system analysis using decision-making tools Covers AI applications in different protective relaying functions Discusses issues and challenges in the protection of transmission and distribution systems Includes a dedicated chapter on case studies and applications This book is aimed at graduate students, researchers, and professionals in electrical power system protection, stability, and smart grids.

ARTIFICIAL INTELLIGENCE IN CHEMICAL ENGINEERING

Elsevier Artificial intelligence (AI) is the part of computer science concerned with designing intelligent computer systems (systems that exhibit characteristics we associate with intelligence in human behavior). This book is the first published textbook of AI in chemical engineering, and provides broad and in-depth coverage of AI programming, AI principles, expert systems, and neural networks in chemical engineering. This book introduces the computational means and methodologies that are used to enable computers to perform intelligent engineering tasks. A key goal is to move beyond the principles of AI into its applications in chemical engineering. After reading this book, a chemical engineer will have a firm grounding in AI, know what chemical engineering applications of AI exist today, and understand the current challenges facing AI in engineering. Allows the reader to learn AI quickly using inexpensive personal computers Contains a large number of illustrative examples, simple exercises, and complex practice problems and solutions Includes a computer diskette for an illustrated case study Demonstrates an expert system for separation synthesis (EXSEP) Presents a detailed review of published literature on expert systems and neural networks in chemical engineering

ARTIFICIAL INTELLIGENCE IN PROCESS SYSTEMS ENGINEERING

BRIEF OVERVIEW OF AI AND ITS ROLE IN PROCESS SYSTEMS ENGINEERING

ARTIFICIAL INTELLIGENCE IN ENGINEERING DESIGN

VOLUME III: KNOWLEDGE ACQUISITION, COMMERCIAL SYSTEMS, AND INTEGRATED ENVIRONMENTS

Elsevier Artificial Intelligence in Engineering Design is a three volume edited collection of key papers from the field of artificial intelligence and design, aimed at providing a description of the field, and focusing on how ideas and methods from artifical intelligence can help engineers in the design of physical artifacts and processes. The book surveys a wide variety of applications in the areas of civil, mechanical, chemical, VLSI, electrical, and computer engineering. The contributors are from leading academic computer-aided design centers as well as from industry.