

Intelligent And Adaptive Systems In Medicine

' *Organizing Around Intelligence* introduces a new mindset and awareness in leading and managing human organizations. This paradigm shift is vital as humankind enters the intelligence era (the knowledge economy). Individual human beings are becoming better informed and educated. They carry knowledge structures of very high quality. Consequently, their interaction dynamic is different and they have to be managed differently. The intelligent organization theory discussed in this book emphasizes the significance of focusing on the human thinking system and the orgmind as the primary strategy. The approach is to organize around intelligence and collective intelligence. Both the human organization and its interacting agents are complex adaptive systems. The importance of awareness and mindfulness, as well as the intelligent person model, is also presented. This fresh leadership and management philosophy contains many new concepts that are not known to human organizations today. Contents: Entering the Intelligence EraThe New ParadigmFundamentals of Intelligent Organization TheoryBasic Structure of Intelligent Human OrganizationThe Human Thinking SystemBasic Intelligence Dynamic and the Intelligent Person ModelArtificial Intelligent Information Systems NetworkInterdependency: The Integrated 3C-OK Framework of Intelligence StrategyTowards a Higher Order of Existence Readership: Leaders and managers in all types of human organization; researchers in organizational science and management philosophy; academics and students interested in intelligent organizations.

Keywords: Intelligent Organization; Orgmind; Collective

Intelligence; Complexity; Nonlinearity; Organizational Learning; Knowledge Structure; Intelligence

StrategyReviews: "Organizing Around Intelligence is about leading, managing and nurturing intelligent human organizations that constantly exploit innovation and creativity embedded at the edge of chaos. The advantage to be exploited is the intelligence advantage and will be beneficial to leaders and managers/executives of businesses, government bodies, institutions of leading, communities and nations. It will also be a useful reference source for researchers in numerous other organization-related domains."SirReadaLot.org '

Genetic algorithms are playing an increasingly important role in studies of complex adaptive systems, ranging from adaptive agents in economic theory to the use of machine learning techniques in the design of complex devices such as aircraft turbines and integrated circuits. *Adaptation in Natural and Artificial Systems* is the book that initiated this field of study,

presenting the theoretical foundations and exploring applications. In its most familiar form, adaptation is a biological process, whereby organisms evolve by rearranging genetic material to survive in environments confronting them. In this now classic work, Holland presents a mathematical model that allows for the nonlinearity of such complex interactions. He demonstrates the model's universality by applying it to economics, physiological psychology, game theory, and artificial intelligence and then outlines the way in which this approach modifies the traditional views of mathematical genetics. Initially applying his concepts to simply defined artificial systems with limited numbers of parameters, Holland goes on to explore their use in the study of a wide range of complex, naturally occurring processes, concentrating on systems having multiple factors that interact in nonlinear ways. Along the way he accounts for major effects of coadaptation and coevolution: the emergence of building blocks, or schemata, that are recombined and passed on to succeeding generations to provide, innovations and improvements.

This book presents selected papers from the 23rd Asia Pacific Symposium on Intelligent and Evolutionary Systems (IES 2019), which was held in Tottori, Japan, on December 6-8, 2019. Today, various types of intelligent system can be found everywhere. However, none of them can be developed or understood from only one perspective. As such, this book collects unique ways of thinking about intelligent systems. It discusses evolutionary and complex adaptive systems, which have been useful approaches for tackling intelligent systems. It also examines the recent developments in the field of artificial intelligence that are driving research on intelligent systems. Addressing topics related to intelligent transport systems, machine learning and neural networks, data science and decision analytics, evolutionary and nature-inspired computation, and agents and complex systems, this book is a valuable resource for researchers and practitioners wanting to develop or understand intelligent and evolutionary systems.

Intelligent Control techniques are becoming important tools in both academia and industry. Methodologies developed in the field of soft-computing, such as neural networks, fuzzy systems and evolutionary computation, can lead to accommodation of more complex processes, improved performance and considerable time savings and cost reductions. Intelligent Control Systems using Computational Intelligence Techniques details the application of these tools to the field of control systems. Each chapter gives an overview of current approaches in the topic covered, with a set of the most important references in the field, and then details the author's

approach, examining both the theory and practical applications.

Volume 1 - Advanced Intelligent Systems for Education and Intelligent Learning System

Methods and Applications

Elements of Artificial Neural Networks

Organizational Survival in the New World

Adaptive Behavior and Intelligent Systems Without Symbols and Logic

Handbook of Research on Modeling, Analysis, and Application of Nature-Inspired Metaheuristic Algorithms

Intelligent/smart systems have become common practice in many engineering applications. On the other hand, current low cost standard CMOS technology (and future foreseeable developments) makes available enormous potentialities. The next breakthrough will be the design and development of "smart adaptive systems on silicon" i.e. very power and highly size efficient complete systems (i.e. sensing, computing and "actuating" actions) with intelligence on board on a single silicon die. Smart adaptive systems on silicon will be able to "adapt" autonomously to the changing environment and will be able to implement "intelligent" behaviour and both perceptual and cognitive tasks. At last, they will communicate through wireless channels, they will be battery supplied or remote powered (via inductive coupling) and they will be ubiquitous in our every day life. Although many books deal with research and engineering topics (i.e. algorithms, technology, implementations, etc.) few of them try to bridge the gap between them and to address the issues related to feasibility, reliability and applications. Smart Adaptive Systems on Silicon, though not exhaustive, tries to fill this gap and to give answers mainly to the feasibility and reliability issues. Smart Adaptive Systems on Silicon mainly focuses on the analog and mixed mode implementation on silicon because this approach is amenable of achieving impressive energy and size efficiency. Moreover, analog systems can be more easily interfaced with sensing and actuating devices.

Elements of Artificial Neural Networks provides a clearly organized general introduction, focusing on a broad range of algorithms, for students and others who want to use neural networks rather than simply study them. The authors, who have been developing and team teaching the material in a one-semester course over the past six years, describe most of the basic neural network models (with several detailed solved examples) and discuss the rationale and advantages of the models, as well as their limitations. The approach is practical and open-minded and requires very little mathematical or technical background. Written from a computer science and statistics point of view, the text stresses links to contiguous fields and can easily serve as a first course for students in economics and management. The opening chapter sets the stage, presenting the basic concepts in a clear and objective way and tackling important -- yet rarely addressed -- questions related to the use of neural networks in practical situations. Subsequent chapters on supervised learning (single layer and multilayer networks), unsupervised learning, and associative models are structured around classes of problems to which networks can be applied. Applications are discussed along with the algorithms. A separate chapter takes up optimization methods. The most frequently used algorithms, such as backpropagation, are introduced early on, right after perceptrons, so that these can form the basis for initiating course projects. Algorithms published as late as 1995 are also included. All of the algorithms are presented using block-structured pseudo-code, and exercises are provided throughout. Software

implementing many commonly used neural network algorithms is available at the book's website. Transparency masters, including abbreviated text and figures for the entire book, are available for instructors using the text.

This book constitutes the proceedings of the International Conference on Adaptive and Intelligent Systems, ICAIS 2011, held in Klagenfurt, Austria, in September 2011. The 36 full papers included in these proceedings together with the abstracts of 4 invited talks, were carefully reviewed and selected from 72 submissions. The contributions are organized under the following topical sections: incremental learning; adaptive system architecture; intelligent system engineering; data mining and pattern recognition; intelligent agents; and computational intelligence.

In this book David and Alex Bennet propose a new model for organizations that enables them to react more quickly and fluidly to today's fast-changing, dynamic business environment: the Intelligent Complex Adaptive System (ICAS). ICAS is a new organic model of the firm based on recent research in complexity and neuroscience, and incorporating networking theory and knowledge management, and turns the living system metaphor into a reality for organizations. This book synthesizes new thinking about organizational structure from the fields listed above into ICAS, a new systems model for the successful organization of the future designed to help leaders and managers of knowledge organizations succeed in a non-linear, complex, fast-changing and turbulent environment. Technology enables connectivity, and the ICAS model takes advantage of that connectivity by fostering the development of dynamic, effective and trusting relationships in a new organizational structure. This book outlines the model in chapter four, and then breaks down the model into its components in the next two chapters. This is a benefit to readers since different components of the model can be implemented at different times, so the book can guide implementation of one or all of the components as a manager sees fit. There are eight characteristics of the ICAS: organizational intelligence, unity and shared purpose, optimum complexity, selectivity, knowledge centricity, flow, permeable boundaries, and multi-dimensionality. * Clear portrait of the successful organization of the future using latest research in knowledge management and complexity theory * Shows concretely how to design an organization that can successfully respond to constant change and uncertainty. * Practical examples woven throughout the discussion.

Intelligent Complex Adaptive Systems

An Experiment in Computational Neuroethology

Scrapbook of Newspaper Clippings of Programs, Announcements, Etc.

Organizing Around Intelligence

7-8 November 1989, Philadelphia, Pennsylvania

Proceedings of the BANKAI workshop, Brussels, Belgium, 12-14 October 1992

The book intends to cover various problematic aspects of emerging smart computing and self-adapting technologies comprising of machine learning, artificial intelligence, deep learning, robotics, cloud computing, fog computing, data mining algorithms, including emerging intelligent and smart applications related to these research areas. Further coverage includes implementation of self-adaptation architecture for smart devices, self-adaptive models for smart cities and self-driven cars,

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decentralized self-adaptive computing at the edge networks, energy-aware AI-based systems, M2M networks, sensors, data analytics, algorithms and tools for engineering self-adaptive systems, and so forth. Acts as guide to Self-healing and Self-adaptation based fully automatic future technologies Discusses about Smart Computational abilities and self-adaptive systems Illustrates tools and techniques for data management and explains the need to apply, and data integration for improving efficiency of big data Exclusive chapter on the future of self-stabilizing and self-adaptive systems of systems Covers fields such as automation, robotics, medical sciences, biomedical and agricultural sciences, healthcare and so forth This book is aimed researchers and graduate students in machine learning, information technology, and artificial intelligence.

Intelligent Adaptive Systems An Interaction-Centered Design Perspective CRC Press

Intelligence takes many forms. This exciting study explores the novel insight, based on well-established ethological principles, that animals, humans, and autonomous robots can all be analyzed as multi-task autonomous control systems. Biological adaptive systems, the authors argue, can in fact provide a better understanding of intelligence and rationality than that provided by traditional AI. In this technically sophisticated, clearly written investigation of robot-animal analogies, McFarland and Bösner show that a bee's accuracy in navigating on a cloudy day and a moth's simple but effective hearing mechanisms have as much to teach us about intelligent behavior as human models. In defining intelligent behavior, what matters is the behavioral outcome, not the nature of the mechanism by which the outcome is achieved. Similarly, in designing robots capable of intelligent behavior, what matters is the behavioral outcome. McFarland and Bösner address the problem of how to assess the consequences of robot behavior in a way that is meaningful in terms of the robot's intended role, comparing animal and robot in relation to rational behavior, goal seeking, task accomplishment, learning, and other important theoretical issues. David McFarland is Reader in Animal Behaviour at the University of Oxford. Thomas Bösner is Head of the Man Machine Research Group at Westfälische Wilhelms Universität, in Münster, and a partner in the consulting firm Advanced Concepts.

Intelligent and adaptive techniques are rapidly being used in all stages of medical treatment, from the initial diagnosis to planning delivery and follow-up therapy. To realize the full potential of these techniques, developers and end users must understand both the underlying technology and the specifics of the medical application considered. Focusing on this growing area of interest, Intelligent and Adaptive Systems in Medicine clearly and concisely explains a range of adaptive and intelligent systems, highlighting their benefits and limitations with realistic medical examples. Bringing together theory and practice, this volume describes the application of adaptive and intelligent control as well as intelligent systems in the diagnosis, planning, treatment, and follow up of diseases such as cancer. Each chapter presents a family of an intelligent and adaptive system, explains the techniques and

Read Free Intelligent And Adaptive Systems In Medicine

algorithms behind these systems, and explores how to solve medical and biomedical problems using intelligent and adaptive systems. The book focuses on the methods of fuzzy logic, artificial neural networks, neuro-fuzzy modeling, adaptive and predictive control, systems and statistical modeling, and image processing. By assessing the use of intelligent and adaptive techniques for medical diagnosis and therapy, this guide promotes further research in this area of "techno-medicine." It provides researchers and clinicians with the tools and processes that are leading to the invaluable use of intelligent systems in early diagnoses and effective treatment.

Smart Computing and Self-Adaptive Systems

Technology Enhanced Support for Learners and Teachers

An Introductory Analysis with Applications to Biology, Control, and Artificial Intelligence

Proceedings of the ISCA 12th International Conference, San Francisco, CA, USA, July 9-11, 2003

Intelligent Behavior in Animals and Robots

Smart Adaptive Systems on Silicon

Recent advances in artificial intelligence have given rise to many paradigms including Artificial Neural networks, Fuzzy Logic and genetic Algorithm for solving complex tasks like modeling, detection and prediction. This book describes the use of intelligent and adaptive technologies for successfully tackling prediction, detection, segmentation and modeling tasks in modern clinics both at the anatomical and biological level. This guide gives the reader practical examples of utilizing advanced artificial intelligence paradigms in a clinical setting. Different applications of signal and image processing illustrate how intelligent biomedical tools can be developed for modeling, detection and prediction tasks from clinical data. Finally, the pros and cons of using intelligent and adaptive technologies are discussed for successful application in modern clinics. This guide should prove to be very beneficial for graduate students as well as researcher who wish to use state of the art intelligent and adaptive technologies for solving modeling, prediction and detection problems facing cancer biomedicine for enhancing personalized cancer therapy.

Do Smart Adaptive Systems Exist? is intended as a reference and a guide summarising and focusing on best practices when using intelligent techniques and building systems requiring a degree of adaptation and intelligence. It is therefore not intended as a collection of the most recent research results, but as a practical guide for experts from other areas and industrial users interested in building solutions to their problems using intelligent techniques. One of the main issues covered is an attempt to answer the question of how to select and/or combine suitable intelligent techniques from a large pool of potential solutions. Another attractive feature of the book is that it brings together experts from neural network, fuzzy, machine learning, evolutionary and hybrid systems communities who will provide their views on how these different intelligent technologies have contributed and will contribute to creation of smart adaptive systems of the future.

High IQs don't improve the world. Adaptive intelligence does, because it prioritizes the common good over individual success.

This book features cutting-edge research presented at the second international conference on Artificial Intelligence in Renewable Energetic Systems, IC-AIRES2018, held on 24-26 November 2018, at the High School of Commerce, ESC-Kol é a in Tipaza, Algeria. Today, the fundamental challenge of integrating renewable energies into the design of smart cities is more relevant than ever. While based on the advent of big data and the use of information and communication technologies, smart cities must now respond to cross-cutting issues involving urban

development, energy and environmental constraints; further, these cities must also explore how they can integrate more sustainable energies. Sustainable energies are a major determinant of smart cities' longevity. From an environmental and technological standpoint, these energies offer an optimal power supply to the electric network while creating significantly less pollution. This requires flexibility, i.e., the availability of supply and demand. The end goal of any smart city is to improve the quality of life for all citizens (both in the city and in the countryside) in a way that is sustainable and respectful of the environment. This book encourages the reader to engage in the preservation of our environment, every moment, every day, so as to help build a clean and healthy future, and to think of the future generations who will one day inherit our planet. Further, it equips those whose work involves energy systems and those engaged in modelling artificial intelligence to combine their expertise for the benefit of the scientific community and humanity as a whole.

Adaptation in Natural and Artificial Systems

Applications of Complex Adaptive Systems

Evolving Rule-Based Models

Do Smart Adaptive Systems Exist?

Intelligent and Adaptive Educational-Learning Systems

Intelligent and Adaptive Systems in Cancer Biomedicine

The Smart Innovation, Systems and Technologies book series encompasses the topics of knowledge, intelligence, innovation and the application of these concepts to various fields. The aim of the series is to make available a platform for the publication of books on all aspects of single and multi-disciplinary research on these themes in order to make the latest results available in a readily-accessible form. This book is devoted to the "Intelligent and Adaptive Educational-Learning Systems". It privileges works that highlight key achievements and outline trends to inspire future research. After a rigorous revision process twenty manuscripts were accepted and organized into four parts: Modeling, Content, Virtuality and Applications. This volume is of interest to researchers, practitioners, professors and postgraduate students aimed to update their knowledge on the latest targets for future work in the field of artificial intelligence on education.

This book contains the latest researches on advanced intelligent systems applied in the field of education presented during the International Conference on Advanced Intelligent Systems for Sustainable Development (AI2SD'2019) held on July 08-11, 2019, Marrakech, Morocco. The book proposes new approaches and innovative strategies for the manipulation of data and big data in the educational environment, exploiting the analysis tools, algorithms of artificial intelligence, and machine learning techniques to extract results, which allow improving the performance and effectiveness of the education field, which is a strategic lever for sustainable development. The book deals with concepts, strategies, and approaches developed on various current axes of scientific research in education, such as smart e-learning, smart education (smart classroom, smart assessment and smart teaching and learning), massive open online courses (MOOC), courseware design, and development for smart learning, cloud learning, and mobile learning. The book is intended for all actors in the educational sector, namely students, professors, academic researchers, and stakeholders. It provides a scale forum for the exchange of ideas, approaches, and innovative techniques between these actors on the development and application of intelligent systems in the field of education with the revolution 4.0. The authors of each chapter report the state of the art of the various topics addressed.

results of their own research, laboratory experiments, and successful applications. The purpose of this session is to share the intelligent systems with appropriate tools and techniques for modeling, management, and decision support in the field of education. Intelligent environments represent an emerging topic in research. Next Generation Intelligent Environments: Ambient Adaptive Systems cover all key topics in the field of intelligent ambient adaptive systems. It focuses on the results worked out within the framework of the ATRACO (Adaptive and TRusted Ambient eCOlogies) project. The theoretical background, the developed prototypes, and the evaluation form a fertile ground useful for the broad intelligent environments scientific community as well as for industrial interest groups. The book include: A unique and original collection of chapters on intelligent ambient adaptive systems Broad coverage of the field of intelligent environments research and evaluation, as well as topics such as adaptation within activity spheres Developed prototypes as case studies for readers Computer scientists, engineers and others who work in the area of ambient environments will find the edition interesting for their own work. In addition, graduate students and Ph.D. students specializing in the area of intelligent environments may also get a concrete idea of the major issues to consider when developing intelligent environments in practice.

"This book explores the foundation, history, and theory of intelligent adaptive systems, providing a fundamental resource on the emergence of intelligent adaptive systems in social sciences, biologically inspired artificial social systems, sensory information processing, as well as the conceptual and methodological issues and approaches to intelligent adaptive systems"--Provided by publisher.

Artificial Intelligence in Renewable Energetic Systems

Intelligent Systems and Financial Forecasting

Prerational Intelligence

Renewable Energy for Smart and Sustainable Cities

Special Issue on Hybrid Intelligent Adaptive Systems

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The idea about this book has evolved during the process of its preparation as some of the results have been achieved in parallel with its writing. One reason for this is that in this area of research results are very quickly updated. Another is, possibly, that a strong, unchallenged theoretical basis in this field still does not fully exist. From other hand, the rate of innovation, competition and demand from different branches of industry (from biotech industry to civil and building engineering, from market forecasting to civil aviation, from robotics to emerging e-commerce) is increasingly pressing for more customised solutions based on learning consumers behaviour. A highly interdisciplinary and rapidly innovating field is forming which focus is the design of intelligent, self-adapting systems and machines. It is on the crossroads of control theory, artificial and computational intelligence, different engineering disciplines borrowing heavily from the biology and life sciences. It is often called intelligent control, soft computing or intelligent technology. Some other branches have appeared recently like intelligent agents (which migrated from robotics to different engineering fields), data fusion, knowledge

extraction etc., which are inherently related to this field. The core is the attempts to enhance the abilities of the classical control theory in order to have more adequate, flexible, and adaptive models and control algorithms.

The digital age is ripe with emerging advances and applications in technological innovations. Mimicking the structure of complex systems in nature can provide new ideas on how to organize mechanical and personal systems. The Handbook of Research on Modeling, Analysis, and Application of Nature-Inspired Metaheuristic Algorithms is an essential scholarly resource on current algorithms that have been inspired by the natural world. Featuring coverage on diverse topics such as cellular automata, simulated annealing, genetic programming, and differential evolution, this reference publication is ideal for scientists, biological engineers, academics, students, and researchers that are interested in discovering what models from nature influence the current technology-centric world.

"This book provides an estimable global view of the most up-to-date research on the strategies, applications, practice, and implications of complex adaptive systems, to better understand the various critical systems that surround human life. Researchers will find this book an indispensable state-of-art reference"--Provided by publisher.

This book will advance the understanding and application of self-adaptive intelligent systems; therefore it will potentially benefit the long-term goal of replicating certain levels of brain-like intelligence in complex and networked engineering systems. It will provide new approaches for adaptive systems within uncertain environments. This will provide an opportunity to evaluate the strengths and weaknesses of the current state-of-the-art of knowledge, give rise to new research directions, and educate future professionals in this domain. Self-adaptive intelligent systems have wide applications from military security systems to civilian daily life. In this book, different application problems, including pattern recognition, classification, image recovery, and sequence learning, will be presented to show the capability of the proposed systems in learning, memory, and prediction. Therefore, this book will also provide potential new solutions to many real-world applications.

Intelligent and Adaptive Systems and Software Engineering

Second International Conference, ICAIS 2011, Klagenfurt, Austria, September 6-8, 2011, Proceedings

An Interaction-Centered Design Perspective

Adaptive Intelligence

Surviving and Thriving in Times of Uncertainty

The "intelligence" of traditional artificial intelligence systems is notoriously narrow and inflexible--incapable of adapting to the constantly changing circumstances of the real world. Although traditional artificial intelligence systems can be successful in narrowly prescribed domains, they are

inappropriate for dynamic, complex domains, such as autonomous robot navigation.**This book proposes an alternative methodology for designing intelligent systems based on a model of intelligence as adaptive behavior. The author describes an experiment in computational neuroethology--the computer modeling of neuronal control of behavior--in which the nervous system for an artificial insect is modeled. The experiment demonstrates that simple, complete intelligent agents are able to cope with complex, dynamic environments--suggesting that adaptive models of intelligence, based on biological bases of adaptive behavior, may prove to be very useful in the design of intelligent, autonomous systems. Provides a lucid critique of traditional artificial intelligence research programs Presents new methodology for the construction autonomous agents, which has implications for mobile robotics Of interest to researchers in a variety of fields: artificial intelligence, neural networks, robotics, cognitive science, and neuroscience

This book introduces a novel approach for intelligent visualizations that adapts the different visual variables and data processing to human's behavior and given tasks. Thereby a number of new algorithms and methods are introduced to satisfy the human need of information and knowledge and enable a usable and attractive way of information acquisition. Each method and algorithm is illustrated in a replicable way to enable the reproduction of the entire "SemaVis" system or parts of it. The introduced evaluation is scientifically well-designed and performed with more than enough participants to validate the benefits of the methods. Beside the introduced new approaches and algorithms, readers may find a sophisticated literature review in Information Visualization and Visual Analytics, Semantics and information extraction, and intelligent and adaptive systems. This book is based on an awarded and distinguished doctoral thesis in computer science.

"This book focuses on how intelligent support and adaptive features can be integrated in currently used learning systems and discusses how intelligent and adaptive learning systems can be improved in order to provide a better learning environment for learners"--Provided by publisher.

Dedicated to the consideration of advanced I.T. technologies and their financial applications, this volume contains contributions from an international group of system developers and managers from academia, the financial industry and their suppliers: all actively involved in the development and practical introduction of these technologies into banking and financial organisations. Concentrating on real experience and present needs, rather than theoretical possibilities or limited prototype applications, it is hoped the publication will give a better insight into advanced I.T. practice and potential as it currently exists and motivate today's developers and researchers. In addition to the discussion of a wide range of technologies and approaches to ensure adaptivity, three other major topics are explored in the book: neural networks, classical software engineering techniques and rule-based systems.

Achievements and Trends

Proceedings of the 23rd Asia Pacific Symposium on Intelligent and Evolutionary Systems

Ambient Adaptive Systems

Adaptive Intelligent Systems

Intelligent Control and Adaptive Systems

Best Practice for Selection and Combination of Intelligent Methods

A fundamental objective of Artificial Intelligence (AI) is the creation of intelligent computer programs. In more modest terms AI is simply concerned with expanding the repertoire of computer applications into new domains and to new levels of efficiency. The motivation for this effort comes from many sources. At a practical level there is always a demand for achieving things in more efficient ways. Equally, there is the technical challenge of building programs that allow a machine to do something a machine has never done before. Both of these desires are contained within AI and both provide the inspirational force behind its development. In terms of satisfying both of these desires there can be no better example than machine learning. Machines that can learn have an in-built efficiency. The same software can be applied in many applications and in many circumstances. The machine can adapt its behaviour so as to meet the demands of new, or changing, environments without the need for costly re-programming. In addition, a machine that can learn can be applied in new domains with the genuine potential for innovation. In this sense a machine that can learn can be applied in areas where little is known about possible causal relationships, and even in circumstances where causal relationships are judged not to exist. This last aspect is of major significance when considering machine learning as applied to financial forecasting.

In this book David and Alex Bennet propose a new model for organizations that enables them to react more quickly and fluidly to today's fast-changing, dynamic business environment: the Intelligent Complex Adaptive System (ICAS). ICAS is a new organic model of the firm based on recent research in complexity and neuroscience, and incorporating networking theory and knowledge management, and turns the living system metaphor into a reality for organizations. This book synthesizes new thinking about organizational structure from the fields listed above into ICAS, a new systems model for the successful organization of the future designed to help leaders and managers of knowledge organizations succeed in a non-linear, complex, fast-changing and turbulent environment. Technology enables connectivity, and the ICAS model takes advantage of that connectivity by fostering the development of dynamic, effective and trusting relationships in a new organizational structure. This book outlines the model in chapter four, and then breaks down the model into its components in the next two chapters. This is a benefit to readers since different components of the model can be implemented at different times, so the book can guide implementation of one or all of the components as a manager sees fit. There are eight characteristics of the ICAS: organizational intelligence, unity and shared purpose, optimum complexity, selectivity, knowledge centricity, flow, permeable boundaries, and multi-dimensionality.

As ubiquitous as the atmosphere, intelligent adaptive systems (IASs) surround us in our daily lives. When designed well, these systems sense users and their environments so that they can provide support in a manner that is not only

responsive to the evolving situation, but unnoticed by the user. A synthesis of recent research and developments on IASs from the human factors (HF) and human-computer interaction (HCI) domains, Intelligent Adaptive Systems: An Interaction-Centered Design Perspective provides integrated design guidance and recommendations for researchers and system developers. The book explores a recognized lack of integration between the HF and HCI research communities, which has led to inconsistencies between the research approaches adopted, and a lack of exploitation of research from one field by the other. The authors integrate theories and methodologies from these domains to provide design recommendations for human-machine developers. They then establish design guidance through the review of conceptual frameworks, analytical methodologies, and design processes for intelligent adaptive systems. The book draws on case studies from the military, medical, and distance learning domains to illustrate intelligent system design to examine lessons learned. Outlining an interaction-centered perspective for designing an IAS, the book details methodologies for understanding human work in complex environments and offers understanding about why and how optimizing human-machine interaction should be central to the design of IASs. The authors present an analytical and design methodology as well as an implementation strategy that helps you choose the proper design framework for your needs.

Intelligent Control Systems Using Computational Intelligence Techniques

Intelligence as Adaptive Behavior

A Tool for Design of Flexible Adaptive Systems

Intelligent Systems

The Intelligent Complex Adaptive System

Proceedings of the ISCA 13th International Conference