

A Hybrid Of Fuzzy And Pid Controller For Servo Electro

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BARKER BRADY

Challenges and Future Trends LAP Lambert Academic Publishing

A Hybrid of Fuzzy and Fuzzy Self-Tuning PID Controller for Servo Electro-Hydraulic System
A Hybrid Fuzzy Neural Network Based Approach to Load Modeling and Forecasting
The Development and Analysis of Hybrid Fuzzy/statistically-based Controllers
Soft Computing for Hybrid Intelligent Systems
Springer

New Hybrid Intelligent Systems for Diagnosis and Risk Evaluation of Arterial Hypertension Springer Nature

We describe in this book, recent developments on fuzzy logic, neural networks and optimization algorithms, as well as their hybrid combinations, and their application in areas such as, intelligent control and robotics, pattern recognition, medical diagnosis, time series prediction and optimization of complex problems. The book contains a collection of papers focused on hybrid intelligent systems based on soft computing. There are some papers with the main theme of type-1 and type-2 fuzzy logic, which basically consists of papers that propose new concepts and algorithms based on type-1 and type-2 fuzzy logic and their applications. There also some papers that presents theory and practice of meta-heuristics in different areas of application. Another group of papers describe diverse applications of fuzzy logic, neural networks and hybrid intelligent systems in medical applications. There are also some papers that present theory and practice of neural networks in different areas of application. In addition, there are papers that present theory and practice of optimization and evolutionary algorithms in different areas of application. Finally, there are some papers describing applications of fuzzy logic, neural networks and meta-heuristics in pattern recognition problems.

Hybrid Fuzzy Connectionist Rule-based Systems and the Role of Fuzzy Rules Extraction Infinite Study
The primary purpose of this book is to present information about selected topics on the interactions and applications of fuzzy + neural. Most of the discussion centers around our own research in these areas. Fuzzy + neural can mean many things: (1) approximations between fuzzy systems and neural nets (Chapter 4); (2) building hybrid neural nets to equal fuzzy systems (Chapter 5); (3) using neural nets to solve fuzzy problems (Chapter 6); (4) approximations between fuzzy neural nets and other fuzzy systems (Chapter 8); (5) constructing hybrid fuzzy neural nets for certain fuzzy systems (Chapters 9, 10); or (6) computing with words (Chapter 11). This book is not intend to be used primarily as a text book for a course in fuzzy + neural because we have not included problems at the end of each chapter, we have omitted most proofs (given in the references), and we have given very few references. We wanted to keep the mathematical prerequisites to a minimum so all longer, involved, proofs were omitted. Elementary differential calculus is the only prerequisite needed since we do mention partial derivatives once or twice.

Fuzzy Controllers Springer Science & Business Media

Intelligent Hybrid Systems: Fuzzy Logic, Neural Networks, and Genetic Algorithms is an organized edited collection of contributed chapters covering basic principles, methodologies, and applications of fuzzy systems, neural networks and genetic algorithms. All chapters are original contributions by leading researchers written exclusively for this volume. This book reviews important concepts and models, and focuses on specific methodologies common to fuzzy systems, neural networks and evolutionary computation. The emphasis is on development of cooperative models of hybrid systems. Included are applications related to intelligent data analysis, process analysis, intelligent adaptive information systems, systems identification, nonlinear systems, power and water system design, and many others. **Intelligent Hybrid Systems: Fuzzy Logic, Neural Networks, and Genetic Algorithms** provides researchers and engineers with up-to-date coverage of new results, methodologies and applications for building intelligent systems capable of solving large-scale problems.

Hybrid Fuzzy PID Control of the Bytronic Process Unit CRC Press

In this book, a new approach for diagnosis and risk evaluation of arterial hypertension is introduced. The new approach was implemented as a hybrid intelligent system combining modular neural networks and fuzzy systems. The different responses of the hybrid system are combined using fuzzy logic. Finally, two genetic algorithms are used to perform the optimization of the modular neural networks parameters and fuzzy inference system parameters. The experimental results obtained using the proposed method on real patient data show that when the optimization is used, the results can be better than without optimization. This book is intended to be a reference for scientists and physicians interested in applying soft computing techniques, such as neural networks, fuzzy logic and genetic algorithms, in medical diagnosis, but also in general to classification and pattern recognition and similar problems.

IntechOpen

Reliability technology plays an important role in the present era of industrial growth, optimal efficiency, and reducing hazards. This book provides insights into current advances and developments in reliability engineering, and the research presented is spread across all branches. It discusses interdisciplinary solutions to complex problems using different approaches to save money, time, and manpower. It presents methodologies of coping with uncertainty in reliability optimization through the usage of various techniques such as soft computing, fuzzy optimization, uncertainty, and maintenance scheduling. Case studies and real-world examples are presented along with applications that can be used in practice. This book will be useful to researchers, academicians, and practitioners working in the area of reliability and systems assurance engineering. Provides current advances and developments across different branches of engineering. Reviews and analyses case studies and real-world examples. Presents applications to be used in practice. Includes numerous examples to illustrate theoretical results.

Hybrid Fuzzy-first Principles Modeling BoD - Books on Demand

Fuzzy control theory is an emerging area of research. At the core of many engineering problems is the problem of control of different systems. These systems range all the way from classical inverted pendulum to auto-focusing system of a digital camera. Fuzzy control systems have demonstrated their enhanced performance in all these areas. Progress in this domain is very fast and there was critical need of a book that captures all the recent advances both in theory and in applications. Serving this purpose, this book is conceived. This book will provide you a very clear picture of current status of fuzzy control research. This book is intended for researchers, engineers, and

postgraduate students specializing in fuzzy systems, control engineering, and robotics.

Fuzzy Logic in Artificial Intelligence Springer Science & Business Media

The advent of the computer age has set in motion a profound shift in our perception of science -its structure, its aims and its evolution. Traditionally, the principal domains of science were, and are, considered to be mathematics, physics, chemistry, biology, astronomy and related disciplines. But today, and to an increasing extent, scientific progress is being driven by a quest for machine intelligence - for systems which possess a high MIQ (Machine IQ) and can perform a wide variety of physical and mental tasks with minimal human intervention. The role model for intelligent systems is the human mind. The influence of the human mind as a role model is clearly visible in the methodologies which have emerged, mainly during the past two decades, for the conception, design and utilization of intelligent systems. At the center of these methodologies are fuzzy logic (FL); neurocomputing (NC); evolutionary computing (EC); probabilistic computing (PC); chaotic computing (CC); and machine learning (ML). Collectively, these methodologies constitute what is called soft computing (SC). In this perspective, soft computing is basically a coalition of methodologies which collectively provide a body of concepts and techniques for automation of reasoning and decision-making in an environment of imprecision, uncertainty and partial truth.

Hybrid Fuzzy PID Controller for an Active Vibration Control System Via Genetic Algorithms Springer

This thoroughly refereed and well organized collection of papers is largely based on papers originally presented at the IJCAI'95 Workshop on Fuzzy Logic in AI, held in Montreal, Canada, in August 1995. Additionally, a few papers were invited in order to round off the scope and competent coverage of relevant topics. The 20 revised full papers included are organized in sections on hybrid and novel architectures, machine learning and data mining, image processing and computer vision, and theoretical developments. Focusing on the most pressing problems of AI, the volume supports the view that fuzzy systems combined with traditional AI leads the move towards the next generation of intelligent systems.

Simulation of the Hybrid Fuzzy-boolean Finite State Machine (HFB-FSM) Springer

Pre-compensation for a Hybrid Fuzzy PID Control of a Proportional Hydraulic System.

Special Issue: Hybrid Fuzzy Models Springer Nature

This book is a guide for students, researchers, and practitioners to the latest developments in fuzzy hybrid computing in construction engineering and management. It discusses basic theory related to fuzzy logic and fuzzy hybrid computing, their application in a range of practical construction problems, and emerging and future research trends.

Reliability Management and Engineering Springer

This paper discusses the performance and the impact of disturbances onto a proposed hybrid fuzzy-fuzzy controller (HFFC) system to attain speed control of a variable speed induction motor (IM) drive. Notably, to design a scalar controller, the two features of field-oriented control (FOC), id est, the frequency and current, are employed. Specifically, the features of fuzzy frequency and fuzzy current amplitude controls are exploited for the control of an induction motor in a closed-loop current amplitude input model; hence, with the combination of both controllers to form a hybrid controller. With respect to finding the rule base of a fuzzy controller, a genetic algorithm is employed to resolve the problem of an optimization that diminishes an objective function, id est, the Integrated Absolute Error (IAE) criterion. Furthermore, the principle of HFFC, for the purpose of overcoming the shortcoming of the FOC technique is established during the acceleration-deceleration stages to regulate the speed of the rotor using the fuzzy frequency controller. On the other hand, during the steady-state stage, the rotor stator current magnitude controller is engaged. A simulation is conducted via MATLAB/Simulink to observe the performance of the controller. Thus, from a series of simulations and experimental tests, the controller shows to perform consistently well and possesses insensitive behavior towards the parameter deviations in the system, as well as robust to load and noise disturbances.

Theory and Applications Physica

This book is focused on the use of intelligent techniques, such as fuzzy logic, neural networks and bio-inspired algorithms, and their application in medical diagnosis. The main idea is that the proposed method may be able to adapt to medical diagnosis problems in different possible areas of the medicine and help to have an improvement in diagnosis accuracy considering a clinical monitoring of 24 hours or more of the patient. In this book, tests were made with different architectures proposed in the different modules of the proposed model. First, it was possible to obtain the architecture of the fuzzy classifiers for the level of blood pressure and for the pressure load, and these were optimized with the different bio-inspired algorithms (Genetic Algorithm and Chicken Swarm Optimization). Secondly, we tested with a local database of 300 patients and good results were obtained. It is worth mentioning that this book is an important part of the proposed general model; for this reason, we consider that these modules have a good performance in a particular way, but it is advisable to perform more tests once the general model is completed.

Uncertainty Management with Fuzzy and Rough Sets Springer Science & Business Media

We describe in this book, new methods and applications of hybrid intelligent systems using soft computing techniques. Soft Computing (SC) consists of several intelligent computing paradigms, including fuzzy logic, neural networks, and evolutionary algorithms, which can be used to produce powerful hybrid intelligent systems. The book is organized in five main parts, which contain a group of papers around a similar subject. The first part consists of papers with the main theme of intelligent control, which are basically papers that use hybrid systems to solve particular problems of control. The second part contains papers with the main theme of pattern recognition, which are basically papers using soft computing techniques for achieving pattern recognition in different applications. The third part contains papers with the themes of intelligent agents and social systems, which are papers that apply the ideas of agents and social behavior to solve real-world problems. The fourth part contains papers that deal with the hardware implementation of intelligent systems for solving particular problems. The fifth part contains papers that deal with modeling, simulation and optimization for real-world applications.

Fuzzy Hybrid Computing in Construction Engineering and Management Emerald Group Publishing

A number of academic and industrial researches in control systems have exposed the inherent weaknesses of PID control which are: rigidity, prohibitive computational complexity and non-applicability for intelligent and complex systems. Consequently, a group of researchers have

proposed fuzzy logic control as a better alternative to PID control. This notion has spawned numerous debates among researchers, experts and professionals in the field of control systems. As a result, this book investigates and compares the performance of traditional control techniques with fuzzy logic control which will be optimized and made adaptive to the variations of the sensor input. It will also be proven that fuzzy logic control is far more superior in performance to the existing traditional control techniques. These objectives were achieved through the use of MATLAB and SIMULINK to simulate, tweak and fine-tune the different cases for the response and their respective performance metrics. Interestingly as expected, the results of the simulations show that fuzzy logic control, optimized or not, is better than the traditional control techniques, especially, PID control.

Neuro-Fuzzy Architectures and Hybrid Learning A Hybrid of Fuzzy and Fuzzy Self-Tuning PID Controller for Servo Electro-Hydraulic System
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It is really important to diagnose jaw tumor in its early stages to improve its prognosis. A differential diagnosis could be performed using X-ray images; therefore, accurate and fully automatic jaw lesions image segmentation is a challenging and essential task. The aim of this work was to develop a novel, fully automatic and effective method for jaw lesions in panoramic X-ray image segmentation.

Fuzzy Systems Physica

While several books are available today that address the mathematical and philosophical foundations of fuzzy logic, none, unfortunately, provides the practicing knowledge engineer, system analyst, and project manager with specific, practical information about fuzzy system modeling. Those few books that include applications and case studies concentrate almost exclusively on engineering problems: pendulum balancing, truck backer-upper, cement kilns, antilock braking systems, image pattern recognition, and digital signal processing. Yet the application of fuzzy logic to engineering problems represents only a fraction of its real potential. As a method of encoding and using human knowledge in a form that is very close to the way experts think about difficult, complex problems, fuzzy systems provide the facilities necessary to break through the computational bottlenecks associated with traditional decision support and expert systems. Additionally, fuzzy systems provide a rich and robust method of building systems that include multiple conflicting,

cooperating, and collaborating experts (a capability that generally eludes not only symbolic expert system users but analysts who have turned to such related technologies as neural networks and genetic algorithms). Yet the application of fuzzy logic in the areas of decision support, medical systems, database analysis and mining has been largely ignored by both the commercial vendors of decision support products and the knowledge engineers who use them.

An Optimized Hybrid Fuzzy-Fuzzy Controller for PWM-driven Variable Speed Drives

This book offers a timely overview of fuzzy and rough set theories and methods. Based on selected contributions presented at the International Symposium on Fuzzy and Rough Sets, ISFUROS 2017, held in Varadero, Cuba, on October 24-26, 2017, the book also covers related approaches, such as hybrid rough-fuzzy sets and hybrid fuzzy-rough sets and granular computing, as well as a number of applications, from big data analytics, to business intelligence, security, robotics, logistics, wireless sensor networks and many more. It is intended as a source of inspiration for PhD students and researchers in the field, fostering not only new ideas but also collaboration between young researchers and institutions and established ones.

A HYBRID FUZZY/GENETIC ALGORITHM FOR INTRUSION DETECTION IN RFID SYSTEMS.

Biological systems are inherently stochastic and uncertain. Thus, research in bioinformatics, biomedical engineering and computational biology has to deal with a large amount of uncertainties. Fuzzy logic has shown to be a powerful tool in capturing different uncertainties in engineering systems. In recent years, fuzzy logic based modeling and analysis approaches are also becoming popular in analyzing biological data and modeling biological systems. Numerous research and application results have been reported that demonstrated the effectiveness of fuzzy logic in solving a wide range of biological problems found in bioinformatics, biomedical engineering, and computational biology. Contributed by leading experts world-wide, this edited book contains 16 chapters presenting representative research results on the application of fuzzy systems to genome sequence assembly, gene expression analysis, promoter analysis, cis-regulation logic analysis and synthesis, reconstruction of genetic and cellular networks, as well as biomedical problems, such as medical image processing, electrocardiogram data classification and anesthesia monitoring and control. This volume is a valuable reference for researchers, practitioners, as well as graduate students working in the field of bioinformatics, biomedical engineering and computational biology.

A Hybrid of Fuzzy and Fuzzy Self-Tuning PID Controller for Servo Electro-Hydraulic System