الابحاث التي تم نشرها في الفترة من أكتوبر 2008 وحتي أكتوبر 2012 والخاصة بالدكتور محمد عبد العظيم البرديني

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أبحاث تحت النشر

1- Position Control of X-Y Table Using Adaptive Fuzzy iterative Learning Control
2- Intelligent Control for Anesthesia System based on Interval Type-2 Fuzzy Neural Network
3- Real Time Embedded System Based on a Fuzzy Motor Speed Controller
4- Stable Direct Adaptive Wavelet Neural Networks Control of a Nonlinear Boiler-Turbine System Based on Decentralized Excitation
5- Development of a Flexible Robot Controller
6- Speed Control of the CNC Spindle Motor Using fuzzy Controller Based On PLC.
7- Low Cost Implementation of Space Vector PWM for Driving Two Level Voltage Source Inverters

أبحاث لم يتم نشرها بعد

1- Advanced Controller based on interval Type 2 fuzzy System
2- Wavelet Neural Networks Control System
3- FPGA Based Embedded Control System
4- Visions Based Control System
5- Distributed Control System
6- Support Vector Machine
7- Intelligent Modeling and Control System
8- Ant Colony Based Control System

البحث رقم (1)

Puplished In:

Journal of American Science, 2012;8(3)
http://www.americanscience.org

Title

Genetic Algorithm-based Neural Network For Accidents Diagnosis of Research Reactors On FPGA

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Abstract:

In a nuclear research reactors plant, a fault can occur in a few milliseconds, so locating the fault might be of utmost importance due to safety, and other reasons. Accordingly, there is an increasing demand for automated systems to diagnose such failures. Both Genetic algorithms and neural networks, which are inspired by computation in biological systems, are emerged as established techniques for optimization and learning. So, using Genetic Algorithm (GA)-Based Artificial Neural Network (ANN) to obtain the optimum construction of an Artificial Neural Network, and then implementing it on a field programmable gate array (FPGA) is very interesting due to its high performance and can easily be made parallel. This paper presents a hardware implementation of a neural network that had obtained from Genetic Algorithm (GA) using MATLAB's toolbox. The excellent hardware performance has been performed through the use of field programmable gate array (FPGA), on Xilinx chip, to diagnosis the Multi-Purpose Research Reactor of Egypt accidents patterns, to avoid the risk of occurrence of a nuclear accident. The neural network hardware model has been designed using Xilinx Software environment. [Abdelfattah A. Ahmed; Nwal Ahmed Alfishawy; Mohamed A. Albrdin and Imbaby I. Mahmoud Genetic Algorithmbased Neural Network For Accidents Diagnosis of Research Reactors On FPGA] Journal of American

Science 2012; 8(3):228-234]. (ISSN: 1545-1003).
http://www.americanscience.org. 30

Keywords:

Genetic algorithms (GA), Artificial Neural Networks (ANN), Nuclear Reactors, field programmable gate array (FPGA), Hardware Description Language (HDL).

البحث رقم (2)

Puplished In:

Ain Shams Engineering Journal (2011) 2, 149–160

Title

Direct adaptive interval type-2 fuzzy logic controller for the multivariable anaesthesia system

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KEYWORDS:

Anaesthesia system; Interval type-2 fuzzy sets; Interval type-2 fuzzy logic system; Adaptive interval type-2 fuzzy logic control
Received 9 February 2011; revised 9 August 2011; accepted 25 August 2011
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Abstract :

Direct adaptive fuzzy controller is a class of adaptive fuzzy controllers which use fuzzy logic system (FLS) as controller. Interval type-2 fuzzy sets are able to model and minimize the numerical and linguistic uncertainties associated with the inputs and outputs of fuzzy logic controller (FLC). In this paper, a direct adaptive interval type-2 FLC is proposed for controlling the multivariable anaesthesia system to overcome the uncertainty problem that introduced by large inter and intra-individual variability of the patient's parameters. Simulation results show good performance over a wide range of inter-individual variability of parameters. Also, results show better performance for the proposed controller under the effect of intra-individual variability of parameters than interval type-2 FLC. So, adaptive interval type-2 FLC affords some improvements in performance over the interval type-2 FLC.

البحث رقم (3)

Puplished In:

Journal of Engineering Sciences, Assiut University, Vol. 40, No. 3, pp. 899-911, May 2012 899

Title

FUZZY CONTROLLER DESIGN FOR DC MOTOR USING ANT COLONY OPTIMIZATION ALGORITHM

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(Received February 22, 2012 Accepted March 20, 2012)

Abstract

This paper presents fuzzy controller design using ant colony optimization algorithm (ACO-FC). The objective of ACO-FC is to improve the control performance and design ease of fuzzy controller. In ACO-FC, the antecedent part (IF part) of a fuzzy system is flexibly partitioned in grid type, and the consequent part (THEN part) of each rule is selected by the ants where the route of an ant is regarded as combination of consequent actions selected from every rule. Searching for the best one among all consequence combinations is based mainly on the pheromone matrix among all candidate actions. To verify the control performance of ACO-FC, simulations on position control of a DC motor are performed. Comparison with PID like fuzzy controller demonstrates the advantages of ACO-FC.

KEYWORDS:

Ant colony optimization (ACO), fuzzy controller design, position control.

البحث رقم (4)

Puplished In:

International Journal of Control and Automation Vol. 4 No. 3, September, 2011

Title

Support Vector Machines Based Adaptive Controller for Piston Hydraulic Motor

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Abstract :

Speed control of hydraulic actuator is mainly desirable in diverse hydraulic systems including those for agriculture and most of them are for manufacturing. In all these systems the main demand is to accurately control the speed of the hydraulic actuator under variable operating conditions including various set-points and disturbances. In this paper a generalized predictive control (GPC) which is well known is used based on least squares support vector machines (LS-SVM) as a model reference control. The main drawback of LS-SVM is that the sparseness of standard SVM is lost which means that some of the system parameters are equal to zero. In this contribution a new method for sparseness is introduced. The electro-hydraulic servo system is modeled recursively each sample based on LS-SVM using linear kernel function avoiding linearization when radial basis function (RBF) is employed. Based on the model obtained the control signal is calculated at each sample using GPC. The presented controller performance is compared to that of self-tuning PID controller based on recursive least squares (RLS) algorithm. Keywords: Hydraulic Actuator; Generalized Predictive Controller (GPC); Least squares support vector machines (LS-SVM); Sparseness.

البحث رقم (5)

Puplished In:

Nature http://www.sciencepub.net/nature and Science, 2011;9(5)

Title

Nuclear Research Reactors Accidents Diagnosis Using Genetic Algorithm/Artificial Neural Networks

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Abstract:

The Nuclear Research Reactors plants are expected to be operated with high levels of reliability, availability and safety. In order to achieve and maintain system stability and assure satisfactory and safe operation, there is increasing demand for automated systems to detect and diagnose such failures. In recent

years, both Genetic algorithms and neural networks, which are inspired by computation in biological systems, are emerged as established techniques for optimization and learning. Genetic algorithms have been used in conjunction with neural networks in three major ways: First, genetic algorithms have been used to construct neural network topologies. Second, they have been used to set the weights in fixed architectures. Third, they have been used to select training data and to interpret the output behavior of neural networks. This paper is concerned with the construction of Artificial Neural Networks (ANNs) using Genetic algorithms (GAs) for the nuclear accidents diagnosis. MATLAB
ANNs toolbox and GAs toolbox are employed to optimize an ANN for this purpose. When we apply the results obtained from genetic algorithms on the back-propagation algorithm, the results are similar but the design of ANNs using GAs is useful in terms of automating and optimizing the design and finding weights and biases for the suggested construction. The results obtained show the efficiency of using genetic algorithm, which can construct the high performance neural network structure for the nuclear reactor's input data. The best structure obtained is two layers ANN with correspondence values of weights and biases that are required to construct such network. [Abdelfattah A. Ahmed; Nwal Ahmed Alfishawy; Mohamed A. Albrdini, and Imbaby I. Mahmoud. Nuclear Research Reactors Accidents Diagnosis Using Genetic Algorithm/Artificial Neural Networks. Nature and Science
2011;9(5):64-74]. (ISSN: 1545-0740). http://www.sciencepub.net.

Keywords:

Genetic algorithms (GA), Artificial Neural Networks (ANN), Nuclear Reactors, Accidents Diagnosis, MATLAB.