Editors: Francklin Rivas-Echeverria, Gloria Mousalli-Kayat

Advances in Computational Intelligence, Man-Machine Systems & Cybernetics

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Preface

This year the 9th WSEAS International Conference on COMPUTATIONAL INTELLIGENCE, MAN-MACHINE SYSTEMS and CYBERNETICS (CIMMACS '10) was held at the University of Los Andes, Merida, Venezuela, December 14-16, 2010. The conference remains faithful to its original idea of providing a platform to discuss neural networks, algorithms, time series analysis, neuro-fuzzy systems. fuzzy sets, simulation, modeling and control, prediction and model identification, data analysis, signal processing etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

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Plenary Lecture 1

Current Trends on Command, Control, Modeling and Simulation of the Induction Machines

Professor Marcel Ionel
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Abstract: AC motor drives have produced and still produce a particular high impact in many technical applications. Advantages of adjusting the frequency of operation can not be fully exploited without adjustment command and control strategies through modeling of the corresponding components. Simulation of drive systems is complicated due to the nonlinear high level that they bring to the power electronics and also due to control, adjustments and protection in the transfer of power flux. Moreover, mathematical models of semiconductor and control functions, which are not yet found in many programs, require from the designer or specialist the introduction of its own version of a simulation program. It is currently known that the use of available multi-level modeling, commonly used to describe static converters and each model, can introduce undesirable effects on the behavior of an electric machine. This lecture presents the current trends of advanced control techniques and control of induction machines used for variable frequency drives, depending on the torque, speed and rotor position. The possibilities of command and control without sensors are analyzed. As well, an estimation of the results obtained by modeling and simulation of the control and an adjustable system are discussed. Finally, in the present lecture recommendations are given about how to run a simulated vector for controlled induction electric machines.

Brief Biography of the Speaker: Dr. Marcel IONEL is actually pro-dean of Electrical Engineering Faculty, Valahia University, Targoviste, Romania. From 2004 to 2008 was the dean of his faculty. Teaching activities: “Electrical and Electronic Measurements” Has an extended expertise on functioning of asynchronous engines, power static converters, electrical energy supplied by photovoltaic systems, etc. Has published over 80 papers and has attended National and International Conferences. He also published 10 books in the field of Electrical Engineering and contributed to the projection and installation of the first system to produce photovoltaic energy in Romania. Actually is working in few international research projects.

Plenary Lecture 2

Approaches to Fuzzy Modeling and Control of Dynamic Processes

Professor Eliezer Colina Morles
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Faculty of Engineering
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Abstract: This talk includes some empirical approaches to fuzzy modeling of physical processes, based on input-output variables measurements. These models may be used to design fuzzy controllers in some feedback control configurations. There will be a reference to the use of fuzzy clustering techniques, such as Gustafson-Kessel and C-means algorithms for constructing Takagi-Sugeno fuzzy type models as well as fuzzy invertible singleton type models, which are appropriated controllers in the Internal Model Control scheme.
The talk also includes some considerations on the design of controllers with fixed and mobile set points for the regulation of some uncertain dynamical systems.

Brief Biography of the Speaker: Eliezer Colina Morles, was born in July 1954 and is a native of Zulia State, Venezuela. He graduated as a Systems Engineer at the University of Los Andes, Merida, Venezuela, the degree of Master of Science in Systems Engineering at Case Western Reserve University, Cleveland, USA and the degree of Doctor of Philosophy at the University Of Sheffield, England. He has held various academic positions, from Instructor in 1979, to Professor today. He has conducted research in the area of Automatic Control Systems, in particular in the fields of Intelligent Control Systems, Supervisory Process Control and Fault Detection and Diagnosis in Dynamic Systems, in which he has published several scientific articles. Likewise, he has served as academic supervisor of many undergraduate, master and doctoral students.
Currently, he serves as Coordinator of the Division of Graduate Studies, Faculty of Engineering of the Universidad de Los Andes, Venezuela.