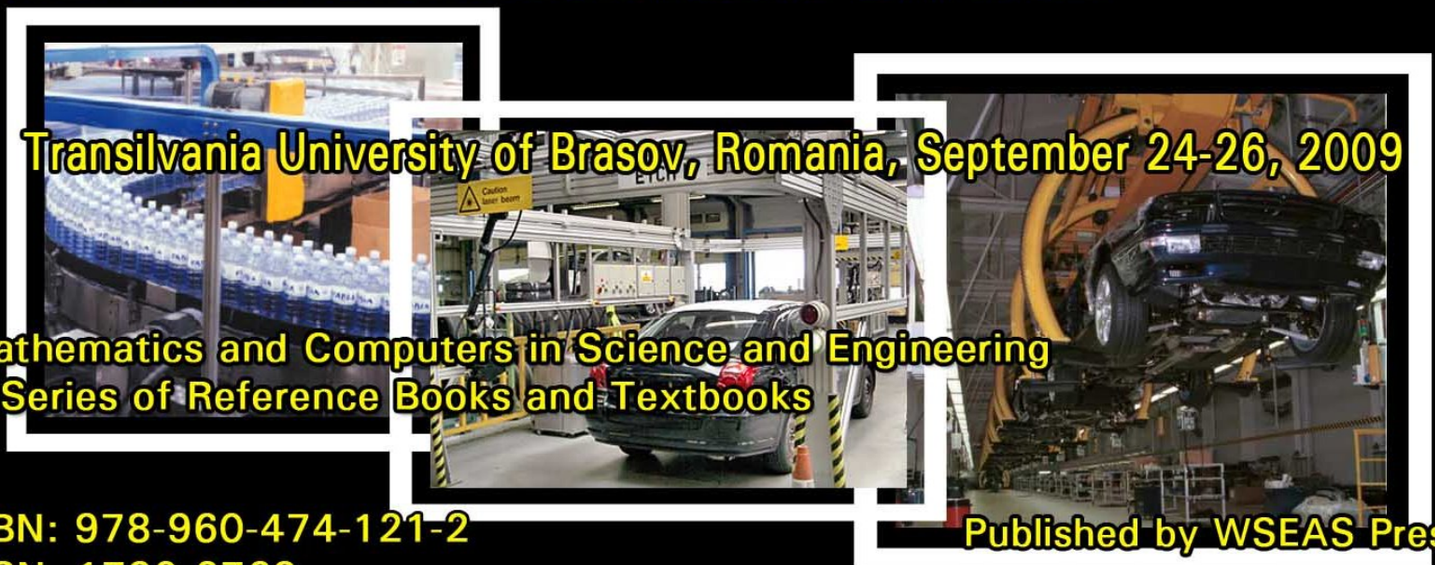
Advances in Manufacturing Engineering, Quality and Production Systems

Volume I

Proceedings of the 1st International Conference on MANUFACTURING ENGINEERING, QUALITY and PRODUCTION SYSTEMS (MEQAPS '09) (Volume I)



Transilvania University of Brasov, Romania, September 24-26, 2009

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ISBN: 978-960-474-121-2
ISSN: 1790-2769

Published by WSEAS Press
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World Scientific and Engineering Academy and Society

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Preface

This year the 1st International Conference on MANUFACTURING ENGINEERING, QUALITY and PRODUCTION SYSTEMS (MEQAPS '09) was held in Brasov, Romania, September 24-26, 2009. The Conference remains faithful to its original idea of providing a platform to discuss numerical modelling and experimental analysis of manufacturing processes, machining processes, forming and shaping of composites, complex systems engineering, emerging technology, manufacturing systems, industrial systems engineering, systems modeling and simulation 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

Quality Improvement in Production Systems with Modern Control Techniques for Electrical Drives

Professor Constantin Volosencu
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Abstract: Production systems are using mechanical machines with motion control systems based on electrical motors. Assurance of good empirical control quality criteria is the main condition in electrical drives. The control of electrical drives provides strong incentives to control engineering in general, leading to the development of new control structures and their introduction to the other area of control. The paper presents a short survey of control quality criteria defined on speed and load torque disturbance responses and their importance in production quality. New control methods as fuzzy logic and interpolation between rules assure better values for main quality criteria and robustness at errors at parameter identification and load torque disturbance influence.

Brief Biography of the Speaker: Prof. Constantin Volosencu graduated in 1981 the Faculty of Electrotechnics, "Traian Vuia" Polytechnic Institute of Timisoara, Romania, as an engineer in automatics and computers and he is doctor in control systems at "Politehnica" University of Timisoara. In present he is professor at "Politehnica" University of Timisoara, Faculty of Automatics and Computers, Department of Automatics and Applied Informatics. His research interest is in linear control systems, fuzzy control, neural networks, control of electrical drives, modelling, simulation, identification and sensor networks. He is author of 9 books and more then 100 scientific papers, published at international conferences and journals. He was manager of over 30 national an international research projects.
Constantin Volosencu worked from 1981 to 1990 at "Electrotimis" Enterprise Timisoara, in the field of the control systems for industrial machines, where he developed control equipments for a large scale of machineries, which are the objects of 27 patents.

Plenary Lecture 2

Design Criteria and Solutions for the NERVA Solid Rocket Cluster

Professor Radu Dan Rugescu
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Abstract: The Romanian orbital launcher project NERVA includes as the first, booster stage, a new propulsion system comprising of a cluster of three to five solid rocket motors with an individual thrust of 400-800 kN, level that depends on the environmental temperature. The total maximum thrust of the cluster equals from 2.4 MN to 4 MN, which represent an impressive challenge for the team of experimental engineers. This also gives to the entire vehicle a very high thrust enhancement that is currently solved through a series of design and manufacturing solutions which are approached for the first time in the country. The challenges and constraints, which were solved in the first stage of the design process, are presented, along with the adopted engineering solutions. They stand as an advanced manufacturing technology contribution to the NERVA space project. Experimental planning and data processing is presented as a part of the quality assurance process, developed by a team of six research and industrial partners.

Brief Biography of the Speaker: Dr. Radu D. Rugescu, Romania, is affiliated with University "Politehnica" of Bucharest, Chair of Aerospace Sciences "Elie Carafoli", Space Sciences Division since 1969, successively as Assist. Professor and Full Professor. With expertise in Astronautics, Thermochemistry, Propulsion Systems, Robotics, Optimization and Statistics, he teaches courses in Romanian, English and German on "Numerical methods", "Processes in Rocket Engines", "Manufacturing technology of aerospace systems", "Astrodynamics", "Turbomaschinen".

His research firsts include a Genuine Rocket Solid Propellant in 1959, The first Romanian liquid propellant rocket engine in 1969, the first Capture of freezing temperature of water-gas reaction in 1982, the first Romanian air-breathing rocket engine in 1987, a New variational method for discontinuous integrands in 1997, a new technology for Air captured imaging and TV live transmission from high altitude airplanes of solar eclipse in 1999, non-Keplerian gravity coupling of very large space structures in 2004. Currently he is the Project Director of the NERVA grant ($800,000) aimed on building the first small orbital launcher in Romania.

He is participating in EU funded space research projects, manages a five-year collaborative research in Space and Energy with Texas A&M University, USA, where he had performed a Fulbright research grant under the sponsorship of the State Department in Space Ecology. and a cooperative research with Stanford University in Combustion Thermochemistry. He is known for 200 publications, including 9 books. His works benefit of 126 quotations, 115 of which are international. He was honored with more than 10 awards (including Who's Who in the World 2007, 2008, 2009, Medal of Freedom 2007, Experts & Expertise 2007, Man of the Year 2007, Gold Medal for Romania 2007, International Peace Prize 2007, Outstanding Intellectuals 2008, Top 100 Engineers 2008, Leading Engineers 2008, Leading Scientists of the World 2008).

He is active member of the Astronautics Commission of the Romanian Academy since 1975, member of the International Institute for Acoustics and Vibrations since 2002 and in other societies.

Plenary Lecture 3

Open Source ERP

Professor Claudia-Georgeta Carstea
Department of Mathematics
Informatics and Social-Human Sciences
"George Baritiu" University
Brasov, ROMANIA
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Abstract: The paper presents a sustainable business model for open source software tools, managing and disseminating documents in heterogeneous software (source code files, database objects, graphical objects, text files) for concurrent economic applications.
The paper motivates the utilization of open source models for the maintenance and adaptation of the application or generic software. It describes the representation of the software Internet computing, the architecture of the open source-based XML repository manager and the most important issues for its implementation.
The system uses encryption and other security mechanisms to ensure that only authorized users can access a concurrent economic application and the date can not be intercepted.

Brief Biography of the Speaker:
Academic Positions:
-Associate Professor, Department of Mathematics, Informatics and Socio-Human Sciences, Faculty of Economic Sciences, Head of the ECDL Department at "George Baritiu" University of Brasov, Romania, where, since 2006, he has held several academic positions.
-experience in Analise and Design Information systems, Databases, Information Technology & Communication, ECDL, Office Automation and Education.
Scientific activity:
-published a total of 17 books (1 book abroad), has participated in 5 national research projects, has published 79 various papers in conference proceedings or refereed journals (22 papers have been published abroad), has participated with 8 papers at the WSEAS Conferences, has published 6 articles in WSEAS Transactions.
Studies:
-Ph.D. in Statistics, Cybernetics and Economic Informatics, Academy of Economics Studies, Bucharest (2006);
-graduate Pedagogic High school, Brasov
-Licensed in Accounting and Economic Informatics
-post-graduate Course in psycho-Pedagogical and methodical training for teaching personnel, Transilvania University of Brasov,
-Bucharest, post-graduate Course Management of projects and programs, Academy of Economics Studies, Statistics, Cybernetics and economic informatics Faculty
-Complete European Computer Driving License Ro 007690;
-Advanced European Computer Driving License, Module 5, Databases, Ro MA5 000044.
Experience:
-Assistant of the Department of Mathematics, Informatics and Socio-Human Sciences, Faculty of Economic Sciences,
-Director of the Education Planning and Organization Department, "George Baritiu" University of Brasov 2005;
-Dean – Faculty of Economics, "George Baritiu" University of Brasov - present

Plenary Lecture 4

Experimental and Numerical Aspects Concerning the Electromagnetic Shielding in Microwaves Range

Associate Professor Dumitru Cazacu
Department of electrical engineering
The University of Pitesti
Romania
E-mail: cazacu_dumitru@yahoo.com

Abstract: The electromagnetic waves can affect the functionality of certain electric and electronic devices. There has been also an increasing public concern about possible health hazards resulting from exposure to the electromagnetic field that PDCs (personal digital cellulars) radiate. The presentation is regarding to the experimental and numerical investigation of some electromagnetic energy absorbing materials in the microwave range. Films of composite materials have been considered. Certain models of the electromagnetic waves transmission line in a conductive and dielectric and 3D finite element analysis of the electromagnetic waves interactions with the those models will be presented.
Also 3D finite element analysis of the electromagnetic waves interaction with certain human head models will described.

Brief Biography of the Speaker: The speaker is Assoc. Professor at the Electrical Engineering department, Faculty for electronics, communications and computers, University of Pitesti, Romania.
He has collaborated on finite element method applications in electromagnetic systems with several important academic institutions: University of Poitiers, ESIP (1 year postdoc stage), Rheinisch-Westfalische Technische Hochschule Aachen (RWTH), Germany and Linz Research Institute for symbolic computation, Johannes Kepler University.
He participated in more then 15 research projects, published 3 books and more then 40 papers in scientific journals and international conferences proceedings. He is the co-author of the book FINITE ELEMENTS in WSEAS Press, 2007.
He is a reviewer for several international conferences (including WSEAS) and he was plenary lecture at the 9th WSEAS Intl. Conference on mathematical methods and computational techniques in electrical engineering (MMACTEE'07), Arcachon, France, 2007.
His research interests include: finite element analysis of the electromagnetic devices and coupled problems, co-simulation, dynamic system simulation, electromagnetic compatibility.
He is member of IEEE Romania EMC Chapter: Association for Electromagnetic Compatibility ACER.

Plenary Lecture 5

Intelligent Systems and their Reliability in Real-Life Applications

Professor Adnan Khashman
Founder and Head of Intelligent Systems Research Group (ISRG)
Faculty of Engineering, Near East University
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Abstract: Intelligent systems in general, and artificial neural network (ANN) systems in particular, have been popularly gaining interest, and seen as potential future solutions to many problems in real-life applications. Areas of applications usually include production and manufacturing, security and intelligence, finance and banking, and much more. Often, an intelligent system would be used for classification, identification, or prediction. The basic idea behind an ANN-based intelligent system is to mimic our natural way of perceiving an input stimulus (often visual stimulus), and then associating it or categorizing it into a set of known classes. For us, humans, the knowledge of these classes is obtained via what we call "experience". The experience for intelligent systems is obtained by exposing the system to numerous examples of what we would like it to learn.
In this lecture a brief review of intelligent systems with focus on ANNs will be presented. Examples of ANN-based intelligent systems which were developed by the speaker will be described; these include real-life applications to face recognition, as well as coin recognition. The reliability of such systems will be discussed and the potential of using ANN-based intelligent systems in manufacturing and production lines will be discussed. The lecture will be concluded with a discussion on whether intelligent systems are reliable enough to replace their human creators.

Brief Biography of the Speaker: Adnan Khashman received his Ph.D. and M.Sc. degrees in electronic engineering from University of Nottingham, England, UK, in 1992 and 1997, respectively, and his B.Eng. degree in electronic and communication engineering from University of Birmingham, England, UK, in 1991. During 1998-2001 he was an Assistant Professor and Chairman of the Computer Engineering Department, Near East University, Nicosia, N. Cyprus. From 2001-2009 he was an Associate Professor and Chairman of the Electrical and Electronic Engineering Department at the same university. From 2007 till 2008 he was also the Vice-Dean of the Engineering Faculty. Since 2009 he is a full Professor and the Head of the Intelligent Systems Research Group (ISRG) which he founded in 2001 at the same university.
His current research interests include emotion modeling in neural networks and their engineering applications, intelligent systems and their applications, image processing, and pattern recognition. Prof. Dr. Khashman is a Senior Member of IEEE, and a reviewer for many journals. He has authored and co-authored more than 65 scientific publications in books, journals, and conference proceedings.