Editors: Nikos Mastorakis, Valeri Mladenov, Badea Lepadatescu,
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Recent Advances in Manufacturing Engineering

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Preface

This year the 4th International Conference on MANUFACTURING ENGINEERING, QUALITY and PRODUCTION SYSTEMS (MEQAPS '11) was held in Barcelona, Spain, September 15-17, 2011. The conference provided a platform to discuss machining processes, productivity and efficiency improvement, total productive maintenance, flexible/integrated manufacturing systems, surface integrity and geometrical precision, complex systems engineering, integrated systems architecture, systems engineering education, technology assessment, large-scale systems, industrial systems engineering, decision analysis and methods, intelligent systems, operations research, project management, 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

Researches Regarding the Improvement of Workpieces Surface Finish by Machining through Superfinishing Process

Associate Professor Badea Lepadatescu
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Manufacturing Technology Department
Faculty of Technological Engineering
Romania
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Abstract: In the paper is presented a machine for superfinishing external surfaces of cylindrical workpieces with diameters between 5 to 30 mm and length between 10 to 300 mm. The surface finish that is obtained for the workpieces is very high with the roughness values Ra between 0,4 - 0,2 im. The parts are placed between two cylinders that have a rotational movement and with nonparallel axis. This feature allow for the parts to have a rotation motion and a transverse motion simultaneously while the abrasive stones which have a reciprocation motion make the abrasion action on the workpiece surfaces.
The machine is automatically fed with parts and has a great productivity. An operator can work and control two these machines in the same time.

Brief Biography of the Speaker:
Badea Lepadatescu is currently an Associate Professor at the Faculty of Manufacturing Engineering of the Transilvania University of Brasov, Romania. He obtained his doctoral degree in 1998 in the area of machining through superfinishing process. After he gratueted he worked five years as design engineer at Roman truck factory in the field of manufacturing processes where designed many devices and special machines especially for superfinishing process. Started on 1982 he worked as research engineer at Transilvania University of Brasov, and after 1997 he is teaching at Faculty of Manufacturing Engineering department. His main academic interests include Tolerance and Dimensional Control, Manufacturing Engineering Processes, Automation Processes, and Renewable Energy Sources. The research accomplishments are reflected through publications in a six books and authored or co-authored over 120 papers published at international conferences. He has extensive experience in both experimental and theoretical research work having more than 50 contracts with factories to design and produce machines for machining processes. Also in the field of Renewable Energy Sources together with a team he made two wind turbines, one with horizontal axis for taking water, and one with vertical axis to produce electric energy. He has been speaker to international conferences, has moderated forums, organized workshops and sessions at major international conferences.

Plenary Lecture 2

Modeling, Stability Analysis and Synthesis of Semiactive Control Strategies for Vibration Mitigation in Structures

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Abstract: For the past three decades, significant research and development have been conducted in the field of structural control to mitigate excessive responses caused by earthquake, wind, etc. Structures such as buildings, bridges and vehicle suspension systems are subject to vibrations that may cause malfunctioning, discomfort or collapse. In order to make structures more resistant against these phenomena, passive and active dampers were initially proposed. Magnetorheological dampers are highly nonlinear semiactive devices that can produce high damping forces with less energy requirements than other devices of their class. Additionally, these systems are characterized by parametric uncertainties, limited measurement availability and unknown disturbances. The presence of these factors makes mandatory the use of complex control techniques in order to get a reliable performance of the control system. This talk will highlight some new control algorithms that incorporate these problems in their formulation, especially, the dynamics of the damper.

Brief Biography of the Speaker:
Hamid Reza Karimi, born in 1976, is a Professor in Control Systems at the Faculty of Engineering and Science of the University of Agder in Norway. His research interests are in the areas of nonlinear systems, networked control systems, robust control/filter design, time-delay systems, wavelets and vibration control of flexible structures with an emphasis on applications in engineering.
Dr. Karimi is a senior member of IEEE and serves as chairman of the IEEE chapter on control systems at IEEE Norway section. He is also serving as an editorial board member for some international journals, such as Mechatronics, Journal of The Franklin-Institute, International Journal of Control, Automation and Systems, Journal of Innovative Computing Information and Control-Express Letters, and International Journal of Control Theory and Applications, etc. He is a member of IEEE Technical Committee on Systems with Uncertainty, IFAC Technical Committee on Robust Control and IFAC Technical Committee on Automotive Control. He was the recipient of the Juan de la Cierva Research Award in 2008, Alexander-von-Humboldt-Stiftung Research Fellowship in 2006, German Academic Exchange Service (DAAD) Research Fellowship in 2003, National Presidency Prize for Distinguished PhD student of Electrical Engineering in 2005 and National Students Book Agency's Award for Distinguished Research Thesis in 2007, etc.