Editorial

Tugrul Özel

Department of Industrial and Systems Engineering,
Rutgers University,
96 Frelinghuysen Road,
Piscataway New Jersey 08854, USA
E-mail: ozel@rci.rutgers.edu

Asif Sabanovic

Faculty of Engineering and Natural Sciences,
Sabanci University,
Orhanli, 34956 Tuzla, Istanbul, Turkey
E-mail: asif@sabanciuniv.edu.tr

Erol Uyar

Department of Mechanical Engineering,
Dokuz Eylül University,
Bornova 35100, İzmir, Turkey
E-mail: erol.uyar@deu.edu.tr

Biographical notes: Tugrul Özel received his PhD in Mechanical Engineering from The Ohio State University in 1998. He is an Associate Professor of Industrial and Systems Engineering at Rutgers University and the Director of Manufacturing Automation and Research Laboratory. His current research interest includes computational modelling of manufacturing processes, machining, mechatronics, automation, control and optimisation of manufacturing systems, and micro/nano manufacturing sciences. He has over ten years of experience in teaching and researching about machining systems and manufacturing automation. He has been reviewer, symposium organiser, guest editor and editorial board member for several international journals and conferences. He has published over 60 refereed papers in international journals and conferences.

Asif Šabanović (Member IEEE 1985-SM IEEE 2003) received BS, MS, and PhD in Electrical Engineering all from University of Sarajevo, Bosnia and Herzegovina in 1970, 1975, and 1979, respectively. Currently, he is Professor at Mechatronics Programme, Sabanci University, Istanbul, Turkey, and Adjunct Professor at Faculty of Electrical Engineering, University of Sarajevo. Previously, he had been Visiting Professor at Caltech, USA, Keio University, Japan, and Yamaguchi University, Japan, Head of CAD/CAM and Robotics Department at Tubitak – MAM, Turkey. His fields of interest include

power electronics, sliding mode control, motion control and mechatronics. He received the Best Paper Awards from the IEEE.

Erol Uyar was educated at Technische Universitaet Stuttgart in Germany where he received his MSc in Energy Engineering and the PhD in Automatic Control of Power Plants. He worked on electrical welding processes as a visiting scientist at Technische Universitaet Hannover, Germany. His interests cover broad aspects of automatic control, stochastic control, system identification, adaptive control, and computer-aided control engineering. He is a member of National Automatic Control Committee, Turkey.

The advances in low-cost robotic devices, sensor technology, computational methods and intelligent software algorithms and agents create ever-more effective solutions to automation problems in a variety of manufacturing industries. The trend in product miniaturisation poses specific problems to microparts assembly. The premise of automated manufacturing systems is that with the better utilisation of sensors, system models, control algorithms and computational methods offer substantial improvements to the production cost and operational quality. This special issue of IJMMS includes research papers related to robotics, mechatronics, and software-based intelligent approaches for automation of manufacturing, material handling, and assembly systems.

This issue begins with an paper on Radically Innovative Mechatronics and Advanced Control Systems (RI-MACS) that is a European funded research project to address some challenges in future automated manufacturing systems. In this paper, Checcozzo et al. provide a broader vision for future of robotics and manufacturing automation and discuss specific approaches to the problem. Next, Bruzzone et al. introduces microtechnonolgies for smart assembly of micro-products that are essential for automation of micro-manufacturing systems. Noureddine et al. discuss fault tolerance in robotics and investigate stages from fault detection, analysis and control with generation of alternative robotics trajectory. Ahmad discusses challenges in vibrations of flexible robot manipulators and introduces an active vibration control technique based on delayed feedback signal and fuzzy logic control. Ozkul studies improvements to the articulated legacy robots with added vision systems. A case study with performance analysis regarding the availability of the robot is provided. Paramasivam and Sornakumar have introduced mobile robotics for box-pushing problem to enhance automated distribution systems. Uyar et al. utilise global positioning system and Kalman filtering techniques as guidance for mobile robots in the outdoor environments with a prototype model. Çetin and Uyar introduce their design of a mechanical manipulator with stereo vision guidance as a mobile robotics solution. Finally, Suebsomran and Butdee introduce a control strategy for automated guided vehicle for use in manufacturing distribution systems.

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