
Editorial

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Biographical notes: Tuğrul Özel is Full Professor of Industrial and Systems Engineering and the Director of Manufacturing & Automation Research Laboratory at Rutgers University. He received his PhD degree in Mechanical Engineering from The Ohio State University in 1998. His current research interests include smart manufacturing, precision machining, laser processing, additive manufacturing, machine learning, mechatronics and automation. He has extensive experience in teaching and researching about manufacturing processes and manufacturing automation.

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Panorios Benardos is Associate Professor in Intelligent Manufacturing at School of Mechanical Engineering, National Technical University of Athens (NTUA) in Greece. He received his PhD degree in Mechanical Engineering from NTUA in 2009. His current research interests include Computer Aided Manufacturing (CAM), Design of Experiments (DoE), Modelling and Optimisation of Manufacturing Processes and Systems, Robotic applications in Manufacturing Processes and Systems, Artificial Intelligence, Machine

This special issue of the *International Journal of Mechatronics and Manufacturing Systems* (IJMMS) includes five research papers related to various aspects of applications of artificial intelligence in smart manufacturing and mechatronics.

Due to the rapid development and applications of advanced technologies, we are experiencing a new industrial revolution, Industry 4.0/5.0, which is a revolution towards further developments in smart manufacturing and mechatronics. The traditional definition of Artificial Intelligence (AI) can be given as the “ability of computational platforms to perform various cognitive functions related to human thinking and decision making, such as perceiving, reasoning, learning, and problem solving”. Due to the recent advances in computational capabilities, computer vision, machine learning, and deep learning tools, the AI techniques are well positioned to provide a unique opportunity to gain further insight on the system-machine-operator-material-process-property-quality relationship as an important enhancement towards process understanding, machine/process control, resource efficiency, product quality, system reliability and overall productivity. Nowadays, the literature is full of rich examples which are presented in over the past several decades.

This special issue brings researchers together about the latest progress in the artificial intelligence for smart manufacturing and mechatronics with high-quality research papers related to advances in artificial intelligence (AI) and machine learning (ML) techniques for smart manufacturing, mechatronics, and Industry 4.0/5.0.

In this special issue, various aspects of smart manufacturing and mechatronics are covered ranging from artificial neural network models for machining parameters and parts repairing using additive manufacturing, machine learning methods towards chatter detection and tool wear prediction in machining systems, designing neural network systems for smart industrial maintenance and applying AI powered robotics and automation tools for tool longevity in gear skiving as presented by several papers from leading research groups.

The Editors Profs. Özel, Kyratsis, and Benardos greatly acknowledges Inderscience publishers’ team for their professional support throughout the preparation of this special. Finally, all editors would like to thank all the authors and all the referees for their availability and their thorough evaluations of the papers appear in this issue.