Editorial

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Biographical notes: L. Norberto López de Lacalle is a Full Professor of the High Performance Machining group in the Department of Mechanical Engineering of the Faculty of Engineering of The University of Basque Country, Bilbao in Spain. He received his Engineering MSc in 1988 and PhD in 1993. In the same year, he began his research about the milling and turning of titanium and nickel alloys, using high-pressure coolant assisted machining. His other important projects include introduction of high speed machining in several die and mould companies in Basque Country. Presently, he has been working on some new projects about five-axis milling and simulation of ball-end milling operations using semi-empirical models. He is a member of Society of Manufacturing Engineers (SME) and American Society of Materials (ASM), and a member of regional committees about machining innovation and industrial development.

T. Özel is an Associate Professor of Industrial and Systems Engineering and the Director of Manufacturing Automation Research Laboratory at Rutgers University. He received his PhD in Mechanical Engineering from The Ohio State University in 1998. His current research interests include advanced manufacturing, computational modelling of machining processes, mechatronics, automation, control of manufacturing systems, and micro/nano manufacturing sciences. He has extensive experience in teaching and researching about high speed machining, manufacturing processes and systems and manufacturing automation. He has been an Editor, Guest Editor, Reviewer, and Editorial Board Member for several international journals and member of scientific committee for many international conferences. He has published over 80 refereed articles in international journals and conferences.

This special issue of the *International Journal of Mechatronics and Manufacturing Systems (IJMMS)* includes ten research articles related to multi-axis machining, machine tool control and mechatronics issues in machine tools. Multi-axis machining is an umbrella term that covers several different machining concepts. The traditional 'multi-axis' unit is a three-axis milling machine with two additional rotational axes, located either in the spindle head or on the machine table. Nowadays, however, any configurable combination of linear and rotational axes can be employed. Broader multi-axis concept includes robots and hexapod machines, which offer higher speeds, higher accelerations, and better stiffness at lower cost. Modern multi-axis complete machining refers to a machine concept that can perform both turning and five-axis milling. A brief summary of the main contributions presented in this special is discussed below.

In this special issue, various aspects of mechatronics issues in multi-axis machine tools such as feed drive modelling for tool path tracking, translational and rotational axes dynamics, accuracy evaluation methods for multi-tasking, modelling and calculation of static and dynamic machine tool stiffness, active vibration control are presented by several articles from leading research groups.

Five-axis milling processes, tool path planning, dynamic effects of lead and tilt angles, and analytical methods to improve tool paths and productivity are also presented by internationally renowned researchers in this field.

The special issue also includes interesting research articles on multi-axis challenges and issues in various advanced machining processes and application including finish milling, centreless grinding and burnishing processes of difficult-to-process materials such as Ti-6Al-4V alloy.

Finally, the 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.