Editorial

Miguel A. Sebastián and Ana M. Camacho

Department of Manufacturing Engineering,
National Distance University of Spain (UNED),
Juan del Rosal 12, 28040-Madrid, Spain
E-mail: msebastian@ind.uned.es
E-mail: amcamacho@ind.uned.es

Biographical notes: Miguel Ángel Sebastián received the MSc Degree in Industrial Engineering in 1976 and the PhD Degree in 1980 from the Polytechnic University of Madrid. Nowadays, he works as Professor and Head of the Department of Manufacturing Engineering of the UNED. He has been Dean of the Higher Technical School of Industrial Engineering (1987–1995), and Vice-Rector for Academic Organisation and Teaching Staff (1999–2005) of the UNED. He is also author of numerous works and scientific-technical papers, taking part and managing several Research Projects financed by the Education and Science Ministry.

Ana María Camacho studied at the University of Castilla-La Mancha (UCLM) where she received the MSc Degree in Industrial Engineering in 2001. In 2005, she obtained the PhD Degree from the UNED, where she is an Associated Professor at the Department of Manufacturing Engineering. She is a member of the Scientific Committee of several international conferences and a reviewer of different journals. She is also the author of a book and more than 40 technical papers, some of them published in journals with impact factor and in the ISI-Proceedings of Thomson Scientific.

Advanced Manufacturing Technologies are the key to the future of Industry. Reduced cost and time, high quality and flexibility are constantly pursued by AMT. The aim of this Special Issue is to provide original contributions in the field of processes, machines, systems and methodologies used in manufacturing.

The research presented in this Special Issue covers a wide range of subject areas, mainly including:

- manufacturing processes and systems
- manufacturing technologies
- analysis and simulation of processes
- CNC machine tools and automation processes
- industrial metrology and quality engineering
- manufacturing and environment.

The nine technical papers included in this Special Issue deal with these matters and their quality have been guaranteed with a rigorous and anonymous peer review process

developed by experts in the field of Manufacturing Engineering. This evaluation process has been very useful in the correction and improvement of manuscripts. A brief summary of the contents of each paper is shown below.

The first paper 'Design and production of wind tunnel testing models with FDM technology using ABSi' presents an experimental study comparing a Rapid Prototyping model constructed of FDM Technologies using ABSi material to that of a standard machined steel model. Results from this study show that increased use of RP components in wind tunnel models could dramatically reduce the cost and time associated with wind tunnel model manufacturing.

In the second paper 'Nano-surface generation using Electrolytic in-Process Dressing (ELID) technique in grinding process', an attempt has been made to understand the fundamental characteristics of electrolytic in process dressing (ELID) grinding and their influence on surface finish. This work states that ELID is the most suitable process for dressing metal-bonded grinding wheels during the grinding process and it is one of the processes used for atomic level metal removal and nano-surface finish.

The third paper 'In-process detection of fastener grip length using embedded mobile wireless sensor network-based pull-type tools' illustrates how unique features from the strain gage and LVDT sensor signatures are extracted to determine the quality of the fastening operations for a hand-held pull-type pneumatic tool. The feature extraction-based methodology detects normal, over, and under grip cases during the fastening process by employing simple rules; hence it is practical to implement as a real-time decision-making tool. In addition, the approach facilitates 100% data collection, for future analysis, on each fastener as opposed to traditional statistical process control techniques, which rely on sampling.

In the fourth paper 'A new approach for formation of virtual cells', a new approach for cell formation that integrates machine grouping and layout design, neglecting part-family formation has been presented. The procedure includes four phases and the efficacy of the methodology is demonstrated through an illustrative example.

In the fifth paper 'Comparing Lagrangian-based distributed algorithms for parallel machine scheduling problems', Lagrangian-based distributed algorithms for scheduling jobs on unrelated parallel machines are presented. The focus of this paper is to investigate the performance of different algorithms based on different knowledge degrees of the parallel machine system. Extensive experimental results are reported, allowing to evaluate the trade-off between knowledge degree and system performance.

The sixth paper 'Analysis of the variability of cutting processes when many factors are perturbed' shows a structured analysis of a turning process, based on well known statistical tools, in order to gain useful information, to evaluate experimental data and to define some improvement guidelines. Based on an excellent dataset, the main objective of this paper is to perform statistical analyses in order to estimate the influence of the cutting process critical factors on response variables.

Often when highly accurate components have to be produced in relatively large volumes, manufacturers may not have a clear idea in utilising widely used CNC machines or less commonly used Special Purpose Modular (SPM) machine tools. Consequently, the most economical method may not be selected resulting in waste of capital and time. This is generally attributable to the lack of sufficient knowledge on SPM machines; and non-existence of an adequate basis for an economical analysis of the two approaches. This fact is explained in the seventh paper 'Productivity improvement using

Special-Purpose Modular machine tools', which can help manufacturers in deciding the most practical and economical method.

The eighth paper 'Neutral line-based Robust Profile Reconstruction for adaptive machining of turbine blade tip welds' discusses a Robust Profile Re-construction (RPR) algorithm to reconstruct the post-usage profile of turbine blades based on sectional measurement data, and further generate the tool path based on the 3D profile. Experimental results provide an effective automation solution to difficult-to-automate processes in aero-engine Maintenance, Repair and Overhaul (MRO).

Finally, in the ninth paper 'Parametric study of hole circularity in Nd:YAG laser microdrilling of alumina–aluminium (Al_2O_3–Al) interpenetrating phase composite', a Nd:YAG laser microdrilling of alumina-aluminium has been carried out and the effects of different process parameters on hole circularity at entry and exit have been investigated.

The Guest Editors would like to thank all the authors for their contributions to the Special Issue, as well as the anonymous referees and especially to Professor Lihui Wang, Editor-in-Chief, for his trust and constant support.