Editorial

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Biographical notes: P. Franco is Technical Director of Laboratorio Universitario de Metrología (LUM) of Universidad Politécnica de Cartagena (UPCT), Spain. He belongs to Departamento de Ingeniería de Materiales y Fabricación of UPCT, and is mainly interested in numerical modelling of manufacturing processes, surface and geometrical precision in final parts and production equipment, modelling of wear resistance in cutting tools, moulds and other devices, dimensional metrology procedures and techniques, CAD/CAE/CAM, quality assurance, and other topics of manufacturing engineering. He is member of the scientific committee of different international meetings, the editorial board of distinct scientific journals, and technical committees such as Commissions of Scientific Meetings and Technology Dissemination of Manufacturing Engineering Society (SIF).

J. Paulo Davim received his PhD in Mechanical Engineering from the University of Porto in 1997 and the Aggregation from University of Coimbra in 2005. Between 1986 and 1996, he was a Lecturer in University of Porto. Currently, he is Aggregate Professor in Department of Mechanical Engineering of the University of Aveiro and Head of MACTRIB – Machining and Tribology Research Group. He has more than 20 years of teaching and research experience in machining, tribology and manufacturing processes. He is Editor-in-Chief of several international journals, and guest editor, member of editorial board, reviewer and scientific advisor for many international journals and conferences. He has also published more than 250 papers in refereed international journals and conferences.

The current production systems must be oriented to solve the strict requirements associated to the increasing demands in terms of dimensional precision, tensile strength, fatigue response, energy efficiency and overall costs in manufactured components, as well as the exigent conditions derived from the strong competence with other companies of the same markets. In order to guarantee the success of enterprise activity in spite of the exigent needs provoked by these factors, the totality of phases involved

in the production chain should be subject to a continuous analysis and optimisation oriented to minimise the dispersion in the control parameters of manufacturing methods, and enhance the reliability of components and systems that can be obtained.

For that reason, a great effort is needed not only in the promotion of advance techniques for material processing, the optimisation of existent manufacturing equipment and processes, and the modelling and characterisation of workpiece behaviour according to selected working conditions, but also in the development of new solutions based on automation of manufacturing operations by robotic applications, the refinement of prior phases dedicated to identification of required functionalities and generation of product design, the prediction of possible failures and upsets in the machines and devices employed for the consecutive operations, and the improvement of frictional behaviour and energy wastes during the expected life of final components.

In accordance to these purposes, a series of research articles specially selected about some of the different aspects to be dealt to improve the manufacturing systems and technologies are contained in this special issue. In the articles published in this journal number, theoretical and experimental studies about different topics such as material removal, product design, advanced manufacturing systems, dimensional metrology, friction conditions, metal forming and supply chain can be found. Grenmyr et al. analyse the wear mechanisms that determine the wear resistant of coated inserts during chip removal in compact graphite iron, including the effect of nodularity and cutting speed. The research work of Bell et al. is focused on structured methodologies for solution of complex tasks associated to product design in the current global markets, in this case applied to optimisation of variable transmissions. Singh and Khamba investigate the barriers to be solved for the optimisation of production systems. The possible influence of the existent barriers is weighted by the Interpretive Structural Modelling (ISM) approach.

For enhanced calibration of articulated arm coordinate measuring machines (AACMM) and robots, the kinematic model developed by Aguilar et al. can be adopted if identification of not geometric errors such as assembly inaccuracies or joints eccentricities must be considered. Kalogiannis et al. centred their effort in the variations provoked in performance of elastohydrodynamic films as a consequence of forced vibrations, in order to understand the response of rotational elements of machine tools and other mechanisms. The behaviour of welded tubes subject to hydroforming techniques is analysed by Ayadi et al. Experimental and numerical results are obtained for tube displacement, wall thickness and internal pressure in base metal and heat-affected zone. The optimisation of supply chain can be achieved by methodologies such as those applied by Chaharsooghi and Heydari, from the statistical distributions assumed for lead time.

It is expressed the acknowledgement to the authors of the totality of articles selected for this special issue, for their contribution to the advance of mechatronics and manufacturing systems by means of the conclusions deduced from their research studies. We are also grateful to the referees that have participated in the reviewing process of this journal number, since they greatly contributed to the respect to the expected quality standards for this scientific publication. The effort of both authors and referees helped to the accuracy and interest of the works disseminated by this special issue of journal IJMMS.