Editorial

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Biographical notes: Shubhabrata Datta received his PhD from Bengal Engineering and Science University, Shibpur in 2003 and currently Assistant Professor of School of Materials Science and Engineering, Bengal Engineering and Science University, Shibpur. His research area includes application of soft computing techniques in the field of Materials Science and Engineering. He has acted as guest editor in many international journal special issues and is a member of the editorial board of an international journal.

Nirupam Chakraborti received his PhD from the University of Washington in 1983 and currently tenured as the Professor and Head of Metallurgical and Materials Engineering at Indian Institute of Technology, Kharagpur. He is also an Adjunct Professor of POSTECH, Korea, affiliated with their Graduate Institute of Ferrous Technology (GIFT). He is a leading researcher in the area of Genetic Algorithms applications in Materials Science and Engineering and written numerous papers on the subject, besides contributing several book chapters and guest editing many international journal special issues, particularly related to the Genetic Algorithms. He is a member of the editorial boards of three international journals and has established active research collaboration with several universities in the USA and Europe.

J. Paulo Davim received his PhD in Mechanical Engineering from the University of Porto in 1997 and his Aggregation from the University of Coimbra in 2005. Between 1986 and 1996 he was a Lecturer in the University of Porto. Currently, he is an Aggregate Professor in the Department of Mechanical Engineering at the University of Aveiro and Head of MACTRIB – Machining and Tribology Research Group. He has more 22 years of teaching and research experience in materials and manufacturing processes. He is the editor of three international journals, guest editor,

editorial board member, reviewer and scientific advisory for many international journals and conferences. He has also published more than 250 papers in SCI journals and conferences.

Manufacturing engineers have the task of catering the demand of increasing productivity, flexibility and quality of the product for its survival in present global competition. The manufacturers have to improve their productivity by automating the production system and optimising their process parameters to achieve maximum efficiency, higher dimensional accuracy, superior mechanical and surface properties of the product. Here comes the demand for different modelling and optimisation techniques in the manufacturing processes to figure out methods and systems to produce in a cost-effective way and provide a marketing edge for the final product. There are several modelling and optimisation techniques to address multi-stage systems with multiple products. Effect of uncertainty factors on the models is another important issue that needs to be addressed. Empirical studies play an important role in this regard, and set the future research directions in the field of manufacturing in this era of mass customisation.

This special issue is to make an attempt to get an insight in this expanding and complex area of demand and to identify some of the major challenges in this area. The main purposes of this issue is to enhance the understanding of some impending methods of manufacturing resource planning by documenting some current state of affairs, and in the process, initiate some fruitful future research by identifying the gaps. The papers in this issue cover a large variety of manufacturing processes including continuous casting, heat treatment, welding, machining, semiconductor manufacturing and material design. The research reported here has also used computing tools varying from conventional statistical methods, wavelets, neural network, fuzzy logic and genetic algorithms. The last five papers in this issue were presented at the *2nd International Conference on Neural Network and Genetic Algorithms in Materials Science Conference (NGMS 2008)* held in Kolkata, India.