
Introduction

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Biographical notes: Yiming Kevin Rong is a Professor at Worcester Polytechnic Institute. He received a BS and an MS in ME from Harbin University of Science and Technology and Tsinghua University, in 1981 and 1984, respectively. He also received an MS in IE from the University of Wisconsin and a PhD in ME from the University of Kentucky, in 1987 and 1989, respectively. He was a Faculty Member at Southern Illinois University from 1990 to 1998. His research areas include computer-aided manufacturing, manufacturing systems, machining and heat treatment processes and computer-aided fixture design. He is a Fellow of ASME and a member of SME and ASEE.

Xiaoping Li received his PhD from the University of New South Wales, Australia in 1991, and joined the National University of Singapore in 1992, where he is currently an Associate Professor in the Department of Mechanical Engineering and Division of Bioengineering. His current research interests include neurosensors and nanomachining. He is a Guest Editor of *International Journal of Computer Applications in Technology*, USA. He is a regular reviewer of *ASME Journal of Manufacturing Engineering*, USA; *Transactions of NAMRI/SME*, USA; *Journal of Materials Processing Technology*, UK; *International Journal of Machine Tools and Manufacture*, UK and *IMEchE Journal of Engineering Manufacture*, UK.

Manufacturing involves intensive tooling operations. Preparation of manufacturing tooling, which includes fixtures, processing tools, inspection tools, and dies and moulds, makes significant contribution to production quality, cost, and cycle time. Since tooling is part of manufacturing systems and also part of manufacturing processes, it is necessary to integrate the tooling development, such as design, analysis, simulation, control, and management, into system planning and process verification. As new manufacturing technologies, systems and processes, such as laser processing and micro/nano-manufacturing, are being developed rapidly, the tooling becomes a contributive factor in reducing the product/process development cycle time with ensured quality and low cost. Nowadays, with more and more outsourcing in manufacturing, tooling techniques face new challenges to adapt and be driven by supplier-based manufacturing strategy. In recent years, the application of

computer modelling, simulation, analysis, optimisation, and management techniques in tooling has been increasingly studied and has played important roles in supporting the development of new products and the improvement of existing production systems, especially in supporting mass customisation. The purpose of this special issue is to provide a forum for the dissemination of information in the state-of-the-art research.

This special issue includes 15 papers, covering topics from traditional machining to micro-nanoscale machining processes; from fixture moulding to machining tools; from cutter design to laser sintering-based rapid tooling; and from tool-condition monitoring to manufacturing process optimisation. These papers represent a state-of-the-art knowledge and development of research in manufacturing tooling and, hopefully, provide valuable information for the research and technological community of manufacturing systems and processes.