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## Editorial

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**Biographical notes:** Liping Fang is a Professor and the Chair of Mechanical and Industrial Engineering at Ryerson University, Toronto, Ontario, Canada, and an Adjunct Professor in the Department of Systems Design Engineering, University of Waterloo. He co-authored two books and is the co-editor of a book. He has published extensively in international journals and conferences. He is an Associate Editor of the *IEEE Transactions on Systems, Man, and Cybernetics, Part A* and *International Journal of Business Process Integration and Management* and a Member of the Editorial Board of the *International Journal of Industrial and Systems Engineering*. He is a registered Professional Engineer in the Province of Ontario, Canada, a Fellow of the Canadian Society for Mechanical Engineering (CSME), a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) and of the Institute of Industrial Engineers (IIE) and a Member of the Institute for Operations Research and the Management Sciences (INFORMS).

Fengfeng Xi is a Professor and the Ryerson Research Chair in the Department of Aerospace Engineering at Ryerson University, Toronto, Ontario, Canada. He obtained his PhD from the University of Toronto in 1993 and worked as a Research Officer for the National Research Council of Canada for seven years prior to joining Ryerson University in 2001. He has published over 60 journal papers and over 60 conference papers, co-edited two books and received a number of awards including a best paper award from the FAIM conference in 2004. He has served as Guest Editor for a number of international journals

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Saeed Zolfaghari is an Associate Professor and the Coordinator of Industrial Engineering Program at Ryerson University, Toronto, Ontario, Canada. He is also an Adjunct Professor in the Department of Mechanical Engineering, University of Ottawa. He received his PhD from the University of Ottawa in 1997. His research interests include cellular and flexible manufacturing systems, scheduling, logistics, transportation planning, simulation of production and service systems and computational intelligence. He is a registered Professional Engineer in the Province of Ontario, Canada, a Senior Member of the Institute of Industrial Engineers (IIE) and a Member of the Institute for Operations Research and the Management Sciences (INFORMS) and the Canadian Operational Research Society (CORS).

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Recent technological developments in telecommunication, transportation and information systems have created greater challenges for manufacturers. In their efforts and search for competitive advantage, manufacturers have to continuously adopt new strategies to deal with unpredictable changes in the environment in which they operate. Companies that respond quicker to changes possess competitive advantage over their rivals. In an attempt to address some of the important problems faced by manufacturers, this Special Issue on Manufacturing under Changing Environment aims to explore current research and practices related to this topic including mass customisation, agile manufacturing, reconfigurable manufacturing, change management and other related areas. A total of 16 papers were submitted for consideration for this Special Issue. Among them, eight papers were accepted through a double-blind review process.

The first problem dealt in this Special Issue is mass customisation that aims to enhance overall product design and manufacturing through information gathered from customer preferences. Mass customisation owes its success to some extent to an efficient interaction between product developers and production data. The first paper, ('A visualised manufacturing information system for mass customisation' by Peng and Yu), introduces a visualised manufacturing information system to integrate product models and production data. They utilise Virtual Reality (VR) technology as a visualised tool for the production data retrieval during the process of product model review and evaluation in the product development. In their system, a manufacturing system can be reviewed and configured rapidly according to the need of individual customised products. Another approach to improving mass customisation is to control the variety of customer orders through product portfolios. This is the focus of the second paper, ('A web-based product portfolio decision support system' by Zhang and Jiao), in which a web-based product portfolio decision support system is developed to enable more accurate and rapid product portfolio decision making.

The second problem addressed in this Special Issue deals with responsiveness of manufacturing systems to rapid changes in the environment through reconfigurable manufacturing systems, agile systems and adaptive enterprises. Owing to the

high-frequency change in manufacturing systems, instead of using conventional Dedicated Machine Lines (DML), the concept of Reconfigurable Manufacturing Systems (RMS) has emerged. RMS would allow for reconfiguration of the existing manufacturing systems with the exact capability and functionality when needed to produce a new product. The third paper, ('Using model engineering for the criticality analysis of reconfigurable manufacturing systems architectures' by Lamotte, Berruet and Philippe), introduces a model for the representation of RMS that takes into account the concepts of architecture (the components of the system) and configuration (the relations among the components). The fourth paper, ('The integration of manufacturing systems using visualised CAPP for agile manufacturing' by Peng and Chung), aims to improve the responsiveness of manufacturing systems through a visualised Computer-Aided Process Planning (CAPP) system. The proposed CAPP system can help improve users' interactive ability in process planning to enhance the integration of manufacturing systems. Another approach to improving responsiveness in manufacturing systems is to adopt the notion of cellular manufacturing systems, which takes advantage of similarities among products and processes. This notion is addressed in the fifth paper, ('An integrated method for multi-objective cell formation in cellular manufacturing systems' by Hu, Chen and Defersha). The sixth paper, ('Building an adaptive manufacturing enterprise for the Hong Kong watchmaking industry' by Noori, Lee and Lau), views the problem at enterprise level and, in particular, issues inherent in evolving Dispersed Manufacturing Networks (DMN). The paper chooses the watchmaking industry in Hong Kong as the case study to discuss the development of a prototype DMN as a portal-based information exchange system for the design, manufacture and distribution of customised products.

Finally, the third problem dealt with in this Special Issue is the responsive scheduling in production systems under highly dynamic working environment. The seventh paper, ('Manufacturing scheduling in decentralised holonic systems using artificial intelligence techniques' by Babiceanu and Chen), addresses the issue of reactive scheduling in decentralised manufacturing systems and proposes one optimal and three heuristic algorithms based on artificial intelligence techniques for a holonic system. The last paper, ('Framework for the dynamic scheduling of complex job shops' by Álvarez and Díaz), discusses heuristic approaches for a dynamic scheduling problem in discrete manufacturing where unexpected disturbances take place.

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