

Special Issue on Digital Enterprise Technologies in Manufacturing

Editorial

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The guest editors are delighted to present this special issue on Digital Enterprise Technologies in Manufacturing to international researchers and practitioners in the manufacturing and related technology and service sectors. The special issue includes carefully selected papers presented at the 9th International Conference on Digital Enterprise Technology held on 29-31 of March 2016 in Nanjing, China. Authors were invited to re-write, extend and significantly improve their papers presented at DET2016.

The main aim of the conference was to provide an international forum for the exchange of leading edge scientific knowledge and industrial experiences regarding the development, integration and applications of the various aspects of digital enterprise technologies in the global manufacturing and knowledge economy era.

Digital Enterprise Technology is defined by the conference scientific committee as the collection of systems and methods for the digital modelling, simulation and optimisation of the collaborative product development, factory and manufacturing processes planning along their lifecycle. The guiding idea of the conference is to find a common understanding of employing digital enterprise technologies in the factories of the future, moving from automated to flexible, digital, sustainable, smart and intelligent manufacturing.

In total, 187 delegates from 15 countries and regions attended the conference, of which 27 delegates were from multi-national companies. A total of 121 papers were accepted for presentation at the conference, of which 25 papers were selected for potential inclusion in this special issue. All selected papers had gone

through the journal's standard review process. Based on the recommendations of international reviewers, 15 papers have been finally selected by the guest editors.

The special issue starts with an overview paper written by James Gao and Andrew Nee (in addition to the 15 selected papers), which provides an introduction of the main issues and future research directions in knowledge management in the manufacturing industry with an emphasis on the sharing of manufacturing knowledge in the product development process. The 15 technical papers can be broadly grouped into the following interrelated topics:

Two papers reported research on issues related to **virtual reality and human-computer interface** in product design and part production design, i.e., 'Improvement of user experience using virtual reality in open-architecture product design' authored by Song, *et al*; and 'An interactive and immersive human-computer interface for rapid composite part production design' authored by McConnell, *et al*.

One research group reported their work on **knowledge sharing frameworks** for global product development and testing processes, i.e., 'A knowledge capturing and sharing framework for improving the testing processes in global product development using storytelling and video sharing' authored by Zammit, *et al*; and 'A new paradigm for virtual knowledge sharing in product development based on emergent social software platforms' authored by Evans, *et al*. Another research group (Li, *et al*) reported an **integrated framework** for the simulation of design and computational fluid dynamics optimisation in their paper entitled 'Association of design and computational fluid dynamics simulation intent in flow control product optimization'.

In the area of **manufacturing systems**, three papers reported research work in cyber-physical, social and smart systems including internet of things and sensor technologies, i.e., 'Incorporating social sensors, cyber-physical system nodes, and smart products for personalized production in a social manufacturing environment' authored by Ding and Jiang; 'A resource-oriented middleware in a prototype cyber-physical manufacturing system' authored by Liu, *et al*; and 'An Internet of Things based framework to enhance just-in-time manufacturing' authored by Xu and Chen.

Two papers reported research in **metrology and inspection** dealing with either large volumes or large complex surfaces in aerospace applications, i.e., 'Thermal compensation using the hybrid metrology approach compared to traditional scaling' authored by Ross-Pinnock and Mullineux; and 'A posture adjustment optimization method of the laser inspection device for large complex surface parts' authored by Zhou, *et al*.

Two papers reported the use of **knowledge base and data mining** technologies in robotic welding and numerical control machining, i.e., 'Optimal pass planning for robotic welding of large-dimension joints with nonuniform grooves' authored

by Yan, *et al*; and 'Data acquisition and data mining in the manufacturing process of computer numerical control machine tools' authored by Wang, *et al*.

Finally, three papers reported research in **precision machining** through toolpath optimisation, analysing machining errors caused by tool rotation and cutting force in numerical machining, i.e., 'A locally optimal transition method with analytical calculation of transition length for computer numerical control machining of short line segments' authored by Du, *et al*; 'Influence of tool rotation errors on flank machined surface' authored by Cao, *et al*; and 'Investigations on the axial cutting force during drilling of carbon fiber composite material' authored by Wu, *et al*.

We would like to express our sincere thanks to all the authors and international peer reviewers for their contribution to this special issue, and hope that the high quality papers in the special issue will enrich the knowledge and stimulate future research interests in this important field.

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