



Editorial



The design, development, implementation and use of *flexible automation and intelligent manufacturing Systems* require an ever-increasing knowledge on enabling technologies and business and operational practices. In that context, the aim of 23rd edition of the FAIM flexible automation & intelligent manufacturing Conference was to discuss **The Challenge of Sustaining Global Competitive Manufacturing Systems** covering current research, best practices and future trends within the areas of global competitiveness and rapidly advancing technologies in flexible automation, information management and intelligent manufacturing.

The aims of both the RCIM journal and the FAIM conference series are to present innovative research best practices and to focus on state-of-the-art trends within the general areas of flexible automation, information management and intelligent manufacturing. This special issue presents several selected and revised papers from FAIM 2013, 23rd edition. This set of selected papers, exploring different topics such as optimization and performance of operations, energy efficiency, data analysis, automation technology, provides a comprehensive overview of the recent advances in the various manufacturing disciplines and tackles the challenge of sustaining global competitive manufacturing issues.

The paper written by Joel Igba et al. focus on the development of a framework oriented to the optimization of the product performance during its entire life cycle and based on the enhancement of in-service knowledge management. Decision support systems oriented to the design of multi-stage manufacturing networks are the focus of the work of Dimitris Mourtzis et al. In particular, this work targets a metaheuristics approach to support decision makers designing multi-stage manufacturing networks, where high-customized products are produced.

Moreover, under the scope of Self-Learning Production Systems, Giovanni Di Orio et al. investigate the integration of context awareness and data mining techniques with traditional monitoring and control solutions to reduce maintenance problems, production line downtimes and manufacturing operational costs while guaranteeing a more efficient management of the manufacturing resources. Finally, Sushma Kumari et al. developed an automated self-adaptive multi agent system to support SMEs to mitigate the uncertainty in supply chain.

Energy consumption is also an important topic in this special issue. Thus, Tim Spiering et al. presents a systematic approach for energy efficiency benchmarking in injection molding. Also, Patricia Munoz de Escalona analyses the optimum combination of cutting parameters to obtain a low value of surface roughness and minimize energy consumption when milling an austenitic

stainless steel in different cutting environments. Cheol-Soo Lee et al. presents an effective model to estimate the electrode wear of EDM-drilling. Finally, Hendrik Hopf et al. developed an energy metering approach called “Energy Cards” to support the continuous acquisition of energy data for benchmarking purposes.

Multidisciplinary data analysis and data mining is more and more a relevant topic in advanced manufacturing. Thus, Michael Donauer et al. in “Identifying nonconformity root causes using applied knowledge discovery” presents an innovative approach to support quality managers to identify root causes of nonconformities (NCs) using a pattern identification approach. From other perspective, Carlos Soares et al. investigate two different data mining approaches for customer segmentation in highly customized fashion business. The paper “Simulation of the behavior of pneumatic drives for virtual commissioning of automated assembly systems” presents a simulation model for the pneumatic behavior that can be used in virtual commissioning.

In the paper presented by Bo Svensson et al. a novel approach, based on P-SOP, is proposed to handle multi-agent based control and verification. With this input, it will be possible to decrease the importance of experts in PLC programming as well as reduce deployment time, towards more efficient ramp-up phases. Finally, the work of Rainer Müller and colleagues address the development of a robot-guided bolt tensioning tool and an adaptive tensioning process to show that the tightening process for rotor blade bearings of wind turbines can be automated.

These works represent relevant contributions and results to research domains covered by the international conference FAIM – Flexible Automation & Intelligent Manufacturing. The guest editors wish to express their gratitude to the participants of FAIM 2013 and in particular, we would like to acknowledge all the authors and reviewers who made this Special Issue possible for their excellent contributions. Finally, we believe that the contributions of this Robotics and Computer-Integrated Manufacturing special issue will facilitate the research in this scientific domain.

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