Guest editorial

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Manufacturing is and continues to be an essential part of world's economy. Manufacturing accounts for around 16 % of Europe's GDP. It remains a key driver of R&D, innovation, productivity growth, job creation. 80 % of innovations are made by industries. 75 % of EU exports are in manufacturing products. Each job in manufacturing generates two jobs in service. Manufacturing in the middle of 21st century will look very different from today, and will be virtually unrecognizable from that of 30 years ago. Smart factories will be capable of rapidly adapting their physical and intellectual infrastructures to exploit changes in technology as manufacturing becomes faster, more responsive to changing global markets and closer to customers. The main driver is intelligent and advanced manufacturing technologies.

For meeting challenges, at the beginning of this decade the European Union put forward Europe 2020, a 10-year growth strategy which aims at more than just overcoming the crisis that continues to afflict many of European economies. The next EU framework program for research and innovation, named Horizon 2020, directly supports the policy framework of Europe 2020. According to the European Commission proposal, it starts in 2014 and runs over seven years with total budget of round 80 billion euro. The program's activities related to manufacturing are

mostly concentrated in the activities area called "Leadership in enabling and industrial technology".

We arranged the 3rd International Workshop of Advanced Manufacturing and Automation (IWAMA 2013) on 27–28th October, 2013 at Norwegian University of Science and Technology, Norway. The topics of IWAMA 2013 focused on: (1) intelligent manufacturing technologies; (2) intelligent logistics and supply chains; and (3) intelligent diagnosis and prognosis of wind turbines. After the workshop, we carefully select good papers and ask the authors to modify and extend their papers for further publishing as two special issues in *Advances in Manufacturing*: (1) Intelligent Manufacturing Technologies, and (2) Intelligent Logistics and Supply Chains.

The first special issue is organized as the following: Chapter 1 presents an intelligent label characters recognition approach combining artificial neural networks (ANNs) and machine vision technology. Chapter 2 describes the challenge of using geometric tolerance information to develop intelligent manufacturing systems. A new computer vision approach supported by 3D geometric modeling is presented in Chapter 3. In intelligent quality inspection system, the important issue is to find how accuracy of the geometry of a product made by manufacturing process. Therefore, Chapter 4 develops a hybrid point cloud alignment method which combines swarm intelligence and iterative closest point approach. Chapter 5 is about phase error correction for the fringe projection profilometry by using constrained cubic spline. Chapter 6 presents the importance of virtual digital methods for reaching intelligent manufacturing. Chapter 7 describes how a graph representation can be created for the mesh which is a discrete approximation of n -dimensional space. Intelligent fault diagnosis and prognosis are the key approaches to reach zero-defect manufacturing. Chapters 8, 9, 10 and 11

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turn attention to a Norwegian project of WINDSENSE (add-on instrumentation system for wind turbines) which is supported by Norwegian Research Council. Chapter 8 summarizes and illustrates key data-driven approaches, including ANNs, fuzzy logic systems, genetic algorithm and data mining techniques for supervisory control and data acquisition (SCADA) data analysis and interpretation. Chapter 9 uses ANNs to detect and predict the failures based on SCADA data from a real wind farm. Chapter 10 summarizes the most useful models and approaches for

predicting the remaining useful lifetime (RUL) of wind turbines. The last paper describes a thermal imaging system and thermal radiation detector for real-time condition monitoring of high power frequency converters in wind turbines.

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