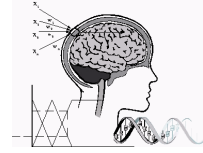# *International*

Innovation in Knowledge Based and Intelligent Engineering Systems

INVITED SESSION SUMMARY

Title of Session:
A*I*, *R*obotics, and *H*uman *M*achine *S*ystems (IROHMS) for smart manufacturing

Name, Title and Affiliation of Chair:
Dr Ze Ji, Cardiff University, UK
Prof Wenjun Xu, Wuhan University of Technology, China
Dr Guoliang Liu, Shandong University, China
Prof Rossi Setchi, Cardiff University, UK

Details of Session (including aim and scope):

Digital technologies, such as AI, Robotics, Big Data, IoT, and human machine interfaces, provide a great potential for developing innovative automated driving functions and mobility solutions for the future manufacturing. The digitisation of manufacturing industry and in particular the application of AI and Robotics in the manufacturing processes will lead to many benefits for customised products satisfying individual preferences with fewer delays and fewer defects as well as providing opportunities of new smart business models with local or distributed manufacturing.

However, current smart manufacturing is not smart enough. The gap between the manufacturing sector and research in artificial intelligence, robotics, and human machine interaction, remains large. For example, robots are mostly deployed for pre-programmed tasks nowadays, despite the advancement in robotics, computer vision and AI research. To form a flexible and intelligent production line, machines or robots should be, on one hand, highly smart and autonomous, and, in some cases, capable of collaborating with human operators or other machines and robots.

To address these needs, the aim of this invited session is to present and discuss the recent advances in the field of AI, Robotics, Human Machine Systems, and related digital technologies that can improve manufacturing capabilities, quality, safety, efficiency and intelligence.

This invited session will collect papers of the following subjects, but not limited to:
- Artificial Intelligence, including machine learning and deep learning, for manufacturing
- Robot learning for enhanced skills
- Robot perception, including robot vision and tactile sensing
- Digital manufacturing, including Digital Twin and Cyber-Physical Systems
- Human pose tracking and estimation
- Human robot/machine interaction and collaboration
- Novel measurement and metrology technologies
- Mobile robot autonomous navigation, including SLAM, path planning, and task allocation
- Smart robotics-enabled production, including case studies
- Industrial big data
- Operation optimisation
- Multi-modal human robot/machine interfaces

Main Contributing Researchers / Research Centres (tentative, if known at this stage):

Website URL of Call for Papers (if any):

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