

### Smart Process Manufacturing Driven by Artificial Intelligence

**Theme:** Process industry, which mainly involves elementary raw material industries, such as petroleum, chemical, steel, nonferrous metal, and building, is a fundamental industry. It is now at a critical and historic moment of transformation, which is confronted with a series of problems such as inaccurate perception of industrial data, low production efficiency, high materials consumption and limitations in safety and environment protection. In order to solve these restriction problems in resources, energy, and environment protection, and to increase efficiency in manufacturing, we must pursue the goal of efficient, green, and smart processes in manufacturing and marketing. On the other hand, artificial intelligence includes perception, knowledge representation, learning, reasoning, planning and so on, which has been successfully utilized in diverse areas, such as autonomous vehicles, robotic manipulators, image analysis, art creation, game playing, online assistants, time-series analysis, and target online advertisement. Considering powerful strengths of artificial intelligence in the above fields, it is promising to have deep and tight integration between artificial intelligence and process industry, to achieve “smart process industry”. Based on artificial intelligence, technological process optimization and plant-wide optimization will be realized for production, management, and marketing in process industry, which will then achieve smart, optimal, green and high-end manufacturing. It remains interesting to see how artificial intelligence works for issues related to smart process manufacturing, which has been a subject of significant research interests. With the advent of new developments in artificial intelligence, it has become possible to present new algorithms/strategies for decision-making, production operation, efficiency and safety, information integration, and so forth, which thereby further promotes AI applications in process industry.

The main focus of this Special Issue will be on the new algorithms/strategies/techniques with application of artificial intelligence in process industry, e.g. petroleum, chemical, steel, nonferrous metal, and building materials, while enhancing the applicability of artificial intelligence. This Special Issue provides a platform to facilitate interdisciplinary research and to share most recent developments in various related fields. Detail topics include, but are not limited to, the following subjects:

#### **This special section will focus on (but not limited to) the following topics:**

Smart sensors in process industry, Plant-wide optimization in process industry via artificial intelligence, Coordinate optimization in process industry, Image/video processing in process industry, Natural language processing in process industry, Fault diagnosis/detection via machine learning, Human-computer cooperative co-learning in process industry, Deep learning/Reinforcement learning in process industry, Unbalanced learning/One-shot learning/Zero-shot learning in process industry, Big-data driven modeling, optimization and decision making, Human cyber-physical systems in process industry, Robotics in process industry, Virtual manufacturing in process industry, Internet of things and application in process industry, Safety monitoring and environmental protection in process industry

#### **Manuscript Preparation and Submission**

Follow the guidelines in “Information for Authors” in the IEEE Transaction on Industrial Informatics <http://www.ieee-ies.org/pubs/transactions-on-industrial-informatics> . Please submit your manuscript in electronic form through Manuscript Central web site: <https://mc.manuscriptcentral.com/tii> . On the submitting page #1 in popup menu of manuscript type, select: SS on **Smart Process Manufacturing Driven by Artificial Intelligence**

Submissions to this Special Section must represent original material that has been neither submitted to, nor published in, any other journal. Regular manuscript length is 8 pages.

**Note:** The recommended papers for the section are subject to final approval by the Editor-in-Chief. Some papers may be published outside the special section, at the EIC discretion.

<b>Timetable:</b>	<b>Deadline for manuscript submissions</b>	<b>June 30, 2019</b>
	<b>Expected publication date (tentative)</b>	<b>November 2019</b>

#### **Guest Editors:**

Prof. Feng Qian, East Chian University of Science and Technology, China, [fqian@ecust.edu.cn](mailto:fqian@ecust.edu.cn)

Prof. Huijun Gao, Harbin Institute of Technology, China [hjgao@hit.edu.cn](mailto:hjgao@hit.edu.cn)

Prof. Biao Huang, University of Alberta, Canada [biao.huang@ualberta.ca](mailto:biao.huang@ualberta.ca)

Prof. David Bogle, University College London, United Kindom, [d.bogle@ucl.ac.uk](mailto:d.bogle@ucl.ac.uk)