**DOCS 2023 Special Session Proposal**

**Special Session on “Data-driven Intelligence and Services for Smart Manufacturing (DDAPD)”**

**Organizers:**

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**Aim and Scope**

The volume of data collected in manufacturing is growing. Big data offers a tremendous opportunity in the transformation of today’s manufacturing paradigm to smart manufacturing. Smart manufacturing aims to convert data acquired across the product lifecycle into manufacturing intelligence in order to yield positive impacts on all aspects of manufacturing. Data-driven intelligence and services use artificial intelligence and machine learning tools to analyze and transform massive data into intelligent data insights, which can then be used to improve services and decision making.

Despite data-driven intelligence and services have attracted a lot of attention in intelligent manufacturing, researchers still have many challenges to explore. For example, many problems in machine design lack explicit optimization objectives or are computationally expensive in objective evaluation, resulting in difficulty of achieving a good design. Machine learning approaches have been applied to assist in optimization, which is called data-driven optimization. Model management techniques still play a significantly important role in data-driven optimization. In addition, securing big data techniques, such as secure computations, validation of inputs from endpoints, and privacy-preserving data analytics, plays a significantly important role in guarding both the data and analytics processes against attacks, theft, or other malicious activities that could harm or negatively affect them. Furthermore, data-driven decision making is beneficial to mitigate bias in decisions, avoid fault diagnosis and operation, improve services, and reduce expenses. Finally, the application problems for verifying the efficiency and effectiveness of different approaches are also indispensable.

This special session aims to promote research on data-driven intelligence and services for smart manufacturing.

The topics of this special session include but are not limited to the following topics:

* Data-driven computational intelligence for smart manufacturing
* Big data analytics in product lifecycle
* Data mining in manufacturing
* Deep learning services in the product lifecycle
* Reliable federated learning on manufacturing data
* Intelligent scheduling in manufacturing
* Block chain
* Data-driven industrial diagnosis
* Data-driven industrial forecasting
* Data-driven decision making for smart manufacturing
* Data-driven industrial digitalization
* Real world data-driven industrial applications

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**Short Biography of the Organizers**

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Dr. Xiaohong Zhang received her B.C. and M.S. degrees in Computer Application Technology from [Shanxi Normal University](http://www.hhu.edu.cn/), Linfen, Shanxi, China and [Shanghai Normal University](http://www.hhu.edu.cn/), Shanghai, China, respectively, and Ph.D. in Mechanical Design and Theory from [Taiyuan University of Science and Technology](http://www.tyust.edu.cn/), Taiyuan, Shanxi, China, in 2015. From December 2018 to December 2020, she was a Postdoctoral Research Fellow in Department of industrial engineering, University of Arkansas. Prof. Zhang is now the director of the Division of Industrial and System engineering, [Taiyuan University of Science and Technology](http://www.tyust.edu.cn/). Her areas of expertise include data-driven fault diagnosis, fault prediction and health management, predictive maintenance decision, intelligent management information system.

She is currently the reviewer for some academic journals including IEEE Trans. on reliability, IIE Trans., European Journal of Operational Research, Reliability Engineering & System Safety, Computers & Industrial Engineering, Journal of Mechanical Engineering, International Journal of Production Research, and so on. She is also a member of CCF, and a senior member of ORSC.

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Dr. Hui Shi received her B.C. degrees in Automation from Taiyuan University of Technology, M.S. degrees in Computer Application Technology from Taiyuan University of Science and Technology, Taiyuan, Shanxi, China. And she received her Ph.D. in Mechanical Design and Theory from Taiyuan University of Science and Technology, Taiyuan, Shanxi, China, in 2015. From November 2019 to November 2020, she was a Postdoctoral Research Fellow in School of Computing and Engineering, University of Huddersfield.

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Gang Xie obtained his bachelor's degree in automation, master's degree in control theory and control engineering, and doctor's degree in circuits and systems from Taiyuan University of Technology, in 1994, 2002, and 2006 respectively. Professor Xie now works at Taiyuan University of Science and Technology, China. He is the head of Shanxi Key Lab of Shanxi Key Laboratory of Advanced Control and Equipment Intelligence, and Shanxi “1331” Engineering Research Center for Key Technologies of Flat Panel Display Intelligent Manufacturing Equipment. His research interest includes Machine perception, Intelligent Manufacturing Automation System, and Big Data. He has published more than 100 technical papers in academic journals and conferences.

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