ICIT 2023

The 24th IEEE International Conference on Industrial Technology

Orlando FL, USA | 4 - 6 April, 2023

ICIT 2023 Special Session Proposal

Title of the Proposal:

Advances in Data-Driven Process Monitoring and Control for Intelligent Industrial Production Systems

Technical Outline of the Session and Topics:

Outline of the Session:

In recent years, driven by the rapid advancements in electronics, information and communication technology, data-driven technology and intelligent systems are increasingly used in industrial production and other fields. Due to the ever-increasing demands on product quality and economic benefit, not only are intelligent components and devices implemented and networked, but real-time supervision and control systems are also running in parallel. Consequently, the degree of complexity and automation in modern industrial production systems is continuously growing. Process monitoring and control are gradually solved by data-driven methods, especially from individual intelligence to swarm intelligence. This fact challenges scientists and engineers to develop advanced process monitoring and control methodologies, using offline, stored, or online process data to solve optimal process monitoring and control issues. This Special Session is to provide a forum for researchers and industrial engineers to exchange their latest results on data-driven process monitoring and control techniques in intelligent industrial production, and to discuss the vital issues, challenges and possible future trends in modern large-scale industrial systems. The papers to be accepted in this Special Session are expected to provide the latest developments in data-driven centralized/distributed design approaches, especially new theoretical results with practical applications.

Topics of the Session:

- Data-driven monitoring and control methods
- Data-driven centralized/distributed monitoring and optimal control system designs
- Data-driven optimization methods and applications in industrial production processes
- Cloud/edge computing-aided performance evaluation, diagnosis, decisions and control approaches
- Lifecycle management of industrial digital twins
- AI-aided applications in contemporary industrial systems

IEEE IES Technical Committee Sponsoring the Special Session (if any):

Data-Driven Control and Monitoring

Short bio and contact details of the Session Organizers

- *Organizer 1:*
  Dr. Mingyi Huo, Department of Control Science and Engineering, Harbin Institute of Technology, 150001, Harbin, P.R. China
  (Email: mingyihuo@hit.edu.cn)

  Mingyi Huo received the B.E. degree in detection guidance and control technology and the Ph.D. degree in control science and engineering from Harbin Institute of Technology, Harbin, China, in 2016 and 2023, respectively. She is currently an Assistant Professor with Harbin Institute of Technology. Her research interests include data-driven process monitoring, fault diagnosis, fault-tolerant control, distributed monitoring and control, and their applications on industrial systems.

- *Organizer 2:*
  Prof. Dr.-Ing. Zhiwen Chen, School of Information Science and Engineering, Central South University, 410083, Changsha, P.R. China
  (Email: zhiwen.chen@csu.edu.cn)

  Zhiwen Chen received the B.S. degree in electronic information science and technology and the M.S. degree in electronic information and technology from Central South University, Changsha, China, in 2008 and 2012, respectively, and the Ph.D. degree in electrical engineering and information technology from the University of Duisburg-Essen, Duisburg, Germany, in 2016. He is currently an Associate Professor with Central South University. His research interests are model-based and data-driven fault diagnosis break and health monitoring, and data analytics.

- *Organizer 3:*
  Dr. Yuchen Jiang, Department of Control Science and Engineering, Harbin Institute of Technology, 150001, Harbin, P.R. China
  (Email: yc.jiang@hit.edu.cn)

Yuchen Jiang received the B.E. degree in Automation and the Ph.D. degree in Control Science and Engineering from Harbin Institute of Technology, Harbin, China, in 2016 and 2021, respectively. He is currently an Assistant Professor with Harbin Institute of Technology. His research interests include data-driven process monitoring, fault diagnosis and prognosis, industrial cyber-physical systems, and artificial intelligence.

- *Organizer 4:*
Prof. Dr.-Ing. Hao Luo, Department of Control Science and Engineering, Harbin Institute of Technology, 150001, Harbin, P.R. China
(Email: hao.luo@hit.edu.cn)

Hao Luo received his B.E. degree in electrical engineering from Xi'an Jiaotong University, China, in 2007, the M.Sc. and the Ph.D. degrees in electrical engineering and information technology from University of Duisburg-Essen, Germany, in 2012 and 2016 respectively. He is currently a Professor with Harbin Institute of Technology. His research interests include model-based and data-driven fault diagnosis, fault-tolerant systems and their plug-and-play application on industrial systems.