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Special Session on

Learning-Based Modeling, Estimation and Control of Complex Industrial Systems

Organized and co-chaired by:

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Call for Papers

Technical Outline of the Session and Topics:

With the ever-increasing scale and complexity of modern industrial systems, several factors, such as strong nonlinearities, uncertainties, unknown model structures and changeable operating conditions, can be ubiquitous nowadays. Therefore, it is usually troublesome to model, estimate and control complex industrial systems using traditional first principle methods. By exploiting abundant information revealed in the collected industrial data, the learning-based approach can be an appealing alternative to perform modeling, estimation and control strategies for industrial systems through neural networks, statistical inferences and other machine learning techniques. As a result, learning-based industrial modeling, estimation and control has attracted the attention of both theorists and industrial practitioners.

Due to the diversity of industrial data, this special issue focuses on analysis and learning-based techniques for time-series process data, images, and videos and aims at building a bridge between theoretical analysis of these massive data and learning-based industrial applications. The explosive growth of collected data and the complex and changeable operating environment in modern industry have brought great challenges to data acquisition, signal preprocessing, feature extraction, model construction, parameter estimation, fault diagnosis, controller design, etc. This prompts the academic researcher and engineering practitioners to make unremitting efforts to promote the development of learning-based modeling, estimation and control technologies and their applications in various industrial fields.

Topics of the Session include, but are not limited to:

- Advanced learning-based modeling, estimation and control methods for complex industrial systems
- Nonlinear/time-varying system identification based on time-series process data
- Parameter, state, and output estimation for complex industrial systems
- Soft sensor development based on multivariate data analysis
- Intelligent monitoring, fault diagnosis of complex industrial systems on analytical and learning-based methods
- Learning-based control of industrial systems with complex uncertainties
- Machine learning and deep learning based industrial data analysis
- Image and video processing based soft sensor development
- Model validation and optimization

Author's schedule:

Deadline for submission of special session papers	April 15, 2024
Notification of acceptance	June 10, 2024
Deadline for submission of final manuscript	July 01, 2024

Early submission is highly encouraged for early decision notifications!

All the instructions for paper submission are included in the conference website:
www.iecon-2024.org