

MACHINE LEARNING FOR MONITORING AND CONTROL OF CHEMICAL AND BIOLOGICAL PROCESSES

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Motivation

It is widely believed that we are at the beginning of the fourth industrial revolution that is going to be powered by *data*. This revolution is expected to sweep a wide range of industries including Chemical and Biological industries such as Oil & Gas, Petrochemicals, Pharmaceuticals, Biotechnology, Pulp & Paper, and other manufacturing industries. With the advent of the Internet of Things, these industries are poised to generate large volumes of data. This presents an exciting opportunity to exploit data, computers, and algorithms not only to solve traditional problems surrounding monitoring, fault diagnosis and control but also to provide new insights. The massive scale of data and computing resources also open up novel research avenues for large-scale solutions.

These new data driven approaches to automation will alleviate economic, environmental, and competitive pressures on both traditional and modern industries.

Website

For more information visit: <http://dais.chbe.ubc.ca/ifac2020opentrack/>.



Topics of Relevance

The focus of this *open invited session* is on applications of modern machine learning tools for monitoring and control. In particular, articles that illustrate novel ways of visualizing and processing large-scale data; highlight the heterogeneous and massive nature of industrial data (including time series, text, image/video data); explore novel modelling, monitoring, fault diagnosis and control paradigms are desired. Articles with real industrial applications and implementation or development of relevant advanced software tools are of particular interest.

More detailed list of topics include: (1) Advanced methods for process data visualization and pre-processing; (2) Natural language processing, computer-vision, speech-recognition in process industries; (3) Video and image-based soft-sensors; (4) Hybrid and physics guided modelling; (5) Statistical Machine Learning methods for monitoring, fault diagnosis, control, and optimization; (6) Deep learning or its variants and Reinforcement learning for modelling and control; (7) Condition-based maintenance of process equipment.

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