

CALL FOR PAPERS

Sustainability of industrial implementations of advanced process control (APC)

Manuscript submissions must be made by 31 August 2022.

Advanced Process Control (APC) has gained common acceptance in industry and is considered as a valuable solution to real industrial problems. APC notion is quite broad as it includes various combinations of nonlinear, multivariate and optimization techniques that can improve over standard PID-based control templates. Although the number of reported successful APC applications continually increases and covers more and more processes and control tasks, there remains an issue of sustainability of such solutions. When it is nowadays relatively straightforward to implement APC the problem is to keep its high performance over a long period of time.

The performance degradation over time can be related to human factors, changes in processes, changes in control objectives and set-points, changes in external disturbances and many more.

Therefore, the sustainability requires specific approaches and measures that support performance engineer with clear and reliable information. Measuring of changes in the process performance and the assessment of control performance requires close attention. Industrial applications are characterised by significantly nonlinear and complex properties. The signals used for the analysis are contaminated with noises, trends, missing data, outliers and other “data artefacts”.

Moreover, the online real-time assessment should be performed to indicate potential degradation factors as fast as possible.

The similarities and differences between control system’s degradations and weariness of equipment opens new analysis perspectives.

Potential topics of interest include, but are not limited, to the following:

- Control performance assessment
- Process performance monitoring
- Minimum variance benchmarking
- Outliers detection and filtering
- Oscillations detection
- Causality analysis
- Non-Gaussian statistical analysis
- Fractional-order filtering and assessment
- Fault diagnosis and fault tolerant control
- Real-time monitoring
- Modelling of long -term process /sensor /actuator degradation
- Surveys of Industrial applications

Applications areas, which are normally associated with process control assessments are process industry, chemical engineering, energy systems. However, cross fertilisation of ideas and techniques from other areas, for example: automotive, defence, communication, distribution networks, space industry will be welcomed.



Special Issue Guest Editors

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