

Special Session on

“Contemporary aspects of model predictive control in power electronics”

Organized by

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Call for Papers

Conventional, linear control algorithms are designed based on averaged dynamics of the power electronic systems. In doing so, the switching nature of the converters is bypassed, which can potentially lead to a performance deterioration. To avoid this, control techniques that take the switching aspect of power electronic systems are to be preferred. To this end, model predictive control (MPC) is particularly promising, since it can address switched nonlinear systems, constraints, and systems with multiple inputs and outputs. Hence, MPC can fully exploit the potential of power converters, by operating the system close to its physical limits. As a result, favourable steady-state operation and fast control during transients can be achieved.

Accordingly, the objective of this special session is to bridge the gap between modern control methods and power electronics systems, and to highlight the contemporary aspects and challenges of MPC methods for power electronic systems.

Topics of the Session:

Topics of interest include, but are not limited to:

- Applications of MPC in power electronic systems
- Direct and indirect MPC methods (i.e., MPC without and with a modulator)
- MPC methods for power electronics used in power generation, power transmission/distribution and end-user applications
- Computational methods to solve the underlying optimization problems
- Robustness of MPC algorithms
- Implementation aspects (DSP, FPGA, etc., based)
- Robustness of MPC algorithms
- Stability issues of MPC
- Utilization of system constraints with MPC