IEEE Transactions on Energy Conversion

CALL FOR PAPERS

Special Section on “Model Predictive Control in Energy Conversion Systems”

The Theme: Model Predictive Control (MPC) refers to a broad range of control strategies that make explicit use of a model of the system/device to be controlled optimally. In order to obtain the optimal control signal (or sequence of control signals), MPC optimizes a certain cost function at regular intervals. Due to its unique capabilities to deal with limitations on actuators and system states as well as its theoretical basis, MPC has been widely received and successfully used for many decades, mostly for control of slow industrial plants. However, with continuous advances of control theory and increasing computational capabilities of modern microprocessors, the MPC has recently also become a technically feasible solution for control of energy conversion systems that operate at much faster times scales. Some notable examples of such systems are non-conventional electric power generating and energy storage equipment, electric machinery and electrical vehicles, where energy conversion process (including maximum power extraction, variable speed operation, charging) is commonly regulated by electrical power converters. These individual systems can also make use of advanced energy conversion and communication technologies in order to coordinately support the legacy grid or to form and effectively control small autonomous grids, also known as microgrids. The aim of this Special Section is to provide a timely opportunity for scientists, researchers and practicing engineers to share and disseminate their latest discoveries and results in the area of MPC applications for control of power and energy conversion systems. The submitted papers need to demonstrate strong original contributions and fall within the scope of IEEE Transactions on Energy Conversion. The topics of interest include, but are not limited to, the following:

- MPC algorithms with reduced computational complexity for electrical power conversion systems
- Power control and energy management of electric power generating and energy storage equipment based on MPC
- Distributed MPC for coordinated operation of non-conventional electric power generating and energy storage equipment
- MPC-based coordination of energy storage systems for frequency and voltage support
- Optimal operation of on-site generating and energy storage equipment for building-to-grid integration based on MPC
- MPC-based communication delay tolerant energy conversion systems
- Optimal operation of cogeneration/trigeneration systems based on MPC
- Stability and robustness of MPC in energy conversion systems
- Specific and innovative MPC applications to electric motor drives

Manuscript Preparation and Submission

Prior to preparing a full paper, an extended abstract of 500-1000 words should be emailed in PDF form to the Guest Editor-in-Chief, Tomislav Dragičević (tdr@et.aau.dk). The abstract should concisely describe the main idea of the paper and make a clear case regarding the novelty and technical contribution of the work. The submitted abstract must include the list of all co-authors and identify the corresponding author and his/her affiliation for the purpose of future communications. The team of Guest Editors will evaluate the submitted abstracts for appropriateness and timeliness. Based on scope and suitability for this Special Section, authors will be invited to submit full papers, which will then undergo a peer review process. The full manuscripts will be submitted in electronic format through the Manuscript Central web site: http://mc.manuscriptcentral.com/tec-pes. On the submitting page #1, in the drop-down list for Manuscript Type, select: Model Predictive Control in Energy Conversion Systems.

Timetable

- Deadline for submission of extended abstracts: November 15, 2019
- Announcement of selected abstracts: December 15, 2019
- Deadline for full paper submission: March 1, 2020
- Completion of first review round: May 1, 2020
- Deadline for submission of revised papers: July 1, 2020
- Manuscript final decision: September 15, 2020
- Estimated publication data: December 2020

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