

# IEEE Transactions on Control Systems Technology

## Special Issue on State-of-the-art Applications of Model Predictive Control

Guest Editors:

Fabrizio Dabbene

Mark Cannon

Mohammadreza Chamanbaz

Alf Isaksson

Martina Mammarella

Davide Raimondo

Advancements in computing hardware and refinements of numerical solvers for convex optimization problems have prompted a burst of interest in the utilization of Model Predictive Control (MPC) to a myriad challenging control problems and scenarios. Undoubtedly, the tremendous success enjoyed by model-predictive controllers across a wide variety of industrial and technological settings is ascribable to the potential for optimizing performance while guaranteeing systems constraints satisfaction via recursive on-line optimization. This unique capability represents a most appealing feature in contexts where autonomy, safety, reliability, flexibility, and cost-effectiveness are important or essential requirements. Fueled by the growing success of MPC as a powerful and versatile tool, both in traditional and unconventional control domains, this special issue aims at providing a comprehensive snapshot of the state of the art of advanced applications of Model Predictive Control. On one hand, emphasis will be given to highlighting the benefits provided by the MPC techniques within the context of a given technological problem; on the other hand, to unveiling the challenges encountered when implementing novel theoretical findings to problems with stringent performance specifications and constraints. Within the special issue, the reader will be presented with demanding applications where different MPC techniques have been developed or tailored to achieve the required objectives while abiding by available computational resources. Topics relevant to the special issue include (but are not limited to) the following application areas:

Aerospace

Agriculture 4.0

Automotive

Biotechnology

Chemical Process

Building and Facility Automation

Embedded Systems

Energy Systems

Healthcare

Infrastructures

Marine Systems

Networks

Power Converters and Batteries

Robotics

Water Systems

Submitted articles are expected to present advancements in the MPC design and practice, driven by the specific needs of the considered applications. Off-the-shelf applications of standard MPC schemes with no added value will not be considered. Experimental validation of the proposed design is preferable, but numerical validation based on realistic simulation environments may be also considered. **Only Regular Papers may be submitted to the special issue.** Authors are invited to submit their manuscripts via the Transactions submission portal <https://css.paperplaza.net/journals/tcst/scripts/login.pl>

- Submission Site Opens: January 1, 2022
- Paper Submission Deadline: **September 17, 2022**
- Notification of Final Decision: **March 15, 2023**
- Final Manuscript Submissions: **April 15, 2023**
- Special Issue Publication: **Autumn 2023**