



# ANNUAL CONFERENCE OF THE IEEE INDUSTRIAL ELECTRONICS SOCIETY

Chicago | Illinois, November 3-6, 2024

## Special Session on

### Application Of Predictive Control In Drives, Converters And Renewable Energy

#### Organized and co-chaired by:

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## Call for Papers

### Technical Outline of the Session and Topics:

Recently, Model Predictive Control (MPC) methods have gained considerable attention due to their straightforward design, simple inclusion of different objectives and their discrete nature that is natural for control of power converters. Therefore, it has been designed for a lot of different converter topologies targeting wide range of applications. The basic idea behind this technique is using the system's mathematical model to predict its future behavior according to the different switching states. By solving an optimization problem that includes the control objectives, the predicted variables, and possible constraints of the system, the control actions are applied. However, MPC's design and implementation can impose some limitations due to the high computational burden and/or variable switching frequency operation and/or weighting factors design. Improvements of MPC algorithms and their combination with intelligent controllers were proposed. Therefore, this special session concentrates on the latest advancements of model predictive control algorithms design.

### Topics of the Session include, but are not limited to:

- Latest development and improvements of predictive control algorithms.
- Recent model predictive control solutions for weighting factor elimination.
- New model predictive control methods for switching frequency reduction and control, and computation burdens reduction.
- Model-Free predictive control solutions for power converters in grid connected and motor drive applications.
- Model predictive control designs for power converters: multilevel converters, matrix converters, DC-DC, DC/AC and AC/DC etc.
- Model predictive control for grid connectivity applications: grid-tied converters, active front end rectifiers etc.
- Model predictive control methods for power quality application: active filters, STATCOM, etc...
- Model predictive control for drives applications: induction motors, PMSM machines, etc...
- Hybrid control with model predictive technique: MPC with artificial neural network ANN, MPC- fuzzy logic, MPC-sliding mode, etc.
- Machine learning with model predictive control

### Author's schedule:

Deadline for submission of special session papers April 15, 2024

Notification of acceptance June 10, 2024

Deadline for submission of final manuscript July 01, 2024

Early submission is highly encouraged for early decision notifications!

All the instructions for paper submission are included in the conference website:

[www.iecon-2024.org](http://www.iecon-2024.org)

