

Annual Conference of the IEEE Industrial Electronics Society (IECON 2021)

Special Session on

“Hybrid Control Techniques and Topologies for Multilevel Power Converters”

Organized by

Principal Organizer: Mohammad SHARIFZADEH (mohammad.sharifzadeh@ieee.org)

Affiliation: Ecole de Technologie Supérieure, Montreal, Canada

Background : Multilevel Converters, Modulation Techniques, Grid-Tied Converters

Organizer 1: Hadi Y. KANAAN (hadi.kanaan@usj.edu.lb) Affiliation: Saint-Joseph University of Beirut, Faculty of Engineering – ESIB, Lebanon Background: Modeling and Control of Switch-Mode Converters, Power Quality, Grid-Connected Inverters for Renewable Sources

Organizer 2: Kamal Al-Haddad (kamal.al-haddad@etsmtl.ca)

Affiliation: Ecole de Technologie Supérieure, Montreal, Canada

Background: Topology and Control of Power Converters, Power Quality

Call for Papers

Theme:

Multilevel converters are used in various industrial, commercial, and domestic applications such as grid-connected systems, rectifiers, active power filter, UPS, electrical drives, etc. This type of converter makes use of abundant number of power semiconductor devices for dividing a fraction of DC voltage and generating more voltage levels. Because of high number of semiconductor devices, multilevel converters have high nonlinear behavior which demands an advanced control technique to fulfill the control objectives. In recent years, it has been deeply investigated that the hybrid control technique are the suitable alternative compared to the conventional strategies to control multilevel converters in industrial applications particularly when they are employed grid-connected mode of operation. Various hybrid modulation techniques have been presented which are comparative in different aspects with the conventional pure techniques in terms of better current/voltage harmonic profile, lower switching frequency, excellent capacitor self-voltage balancing

performance and supplying different loads conditions etc. Also, the hybrid advanced non-linear control techniques such as the combination of mode-based control techniques with intelligent-based controls have been proposed to improve grid-connected converters performance under different dynamical and steady states conditions. Therefore, this special session concentrates on the latest development of the hybrid advanced control and switching techniques for grid-connected converters and other possible industrial applications, but not limited to.

Topics of interest include, but are not limited to:

- Hybrid non-linear control for grid-connected (AC-DC/DC-AC) multilevel converters
- Novel hybrid intelligent-based non-linear control techniques
- Machine and deep learning application in power converter controls
- Novel current based control for renewable energy generation applications
- Hybrid PWM switching techniques
- Hybrid cascaded converter topologies for voltage levels multiplication
- Industrial applications of hybrid control techniques in the area of electrification and transportation, UPS, etc.
- New switching and control technique and topologies for multilevel converters

Submissions Procedure: All the instructions for paper submission are included in the conference website: <https://attend.ieee.org/iecon-2021/>

Sponsoring IES Technical Committees

Technical Committee on Power Electronics (TCPE)
Subcommittee on Control in Power Electronics

Deadlines:

Full paper submission:	June 25, 2021
Paper acceptance notification:	July 30, 2021
Camera-ready paper submission	Aug. 27, 2021