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Special Session on

"Advanced Topologies, Control and Switching Techniques of Multilevel Inverters for Renewable Energy Applications"

Organized by

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Call for Papers

Multilevel converters including DC/AC and AC/DC are nowadays used in various industrial, commercial, and domestic applications such as grid-connected systems, rectifiers, active power filter, UPS, electrical drives, etc. This converter makes use of abundant number of power semiconductor devices that should be properly controlled to have maximum efficiency. The primary challenge is to find appropriate topology, design the suitable PWM switching techniques, and apply the appropriate controller. Moreover, since the multilevel converters have nonlinear character, closed loop based system using advanced controllers such as sliding mode, model predictive, adaptive, intelligent methods to meet the targeted application. Therefore, this special session concentrates on the last development of multilevel converters topologies, control and device switching techniques for the renewable energy applications but not limited to.

- Novel circuit topologies for multilevel inverters
- PWM modulation technique for multilevel inverters
- Innovative and intelligent closed loop control strategies
- Novel current based control design for renewable energy generation using grid-connected multilevel inverters
- Recent development techniques for common mode voltage control and drives application

- Industrial applications in the area of power quality, electrification and transportation, UPS, etc.

IES Technical Committee Sponsoring Special Session (if any):

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Additional information to be provided by promoters of the Special Session:

- **Brief CV of SS Organizers (photo, name, email, and short CV** (similar to Transactions paper CV)

Mohammad Sharifzadeh was born in Sari, Iran in 1989. He received the B.Sc. and M.Sc. degrees in power electrical engineering from Babol Noshirvani University of Technology (NIT), Babol, Iran in 2012, and 2015, respectively and the Ph.D. degree (with honors) from École de Technologie Superieure (ÉTS), University of Quebec, Montreal, Quebec, Canada, in 2021. He is currently working as Postdoc Fellow at ÉTS, as a member of Groupe de Recherche en Électronique de Puissance et Commande Industrielle (GRÉPCI). He is author and co-author of 15 IEEE Transaction and Journal papers as well as more than 45 IEEE conference papers. He is also holder of one U.S patent. His research interests include new multilevel converters topologies, PWM switching techniques particularly Selective Harmonic Elimination/Mitigation techniques, advanced control of multilevel voltage source inverters in grid connected applications, optimization methods applications in power system, machine learning applications for power electronic converters, smart power converter, Uninterruptible Power Supply (UPS), Modular Multilevel Converter (MMC) for HVDC applications, multilevel inverter for microgrid system, rectifier converters and battery chargers.

Meysam Gheisarnejad Meysam Gheisarnejad earned B.Sc. degree in Electronic Engineering from Azad University of Lahijan, Iran, in 2009, and subsequently pursued an M.Sc. degree in Control Engineering from Azad University of Najafabad, Iran, in 2013. He was a Research Assistant with the Aarhus University, Arhus, Denmark from 2021 to 2023. His research interests include power system dynamics and control, shipboard microgrids, cyber-physical microgrid, power electronics and renewable energy systems. Meysam has developed a strong proficiency in cutting-edge technologies such as Deep Reinforcement Learning and Quantum Theory.

Kamal Al-Haddad (S'82-M'88-SM'92-F'07) received the B.Sc.A. and M.Sc.A. degrees from the University of Québec à Trois-Rivières, Canada, in 1982 and 1984, respectively, and the Ph.D. degree from the Institute National Polythechnique, Toulouse, France, in 1988. Since June 1990, he has been a Professor with the Electrical Engineering Department, École de Technologie Supérieure (ETS), Montreal, QC, where he has been the holder of the Canada Research Chair in Electric Energy Conversion and Power Electronics since 2002. He has supervised more than 130 Ph.D. and M.Sc.A. students working in the field of power electronics. He is a Consultant and has established very solid link with many Canadian industries working in the field of power electronics, electric transportation, aeronautics, and telecommunications. Dr Al-Haddad and his

team have transferred 23 technologies to the industry in the form of industrial product and integrated technologies along with 3 patents. He has coauthored more than 500 transactions and conference papers. His fields of interest are in high efficient static power converters, harmonics and reactive power control using hybrid filters, switch mode and resonant converters including the modeling, control, and development of prototypes for various industrial applications in electric traction, renewable energy, power supplies for drives, telecommunication, etc. Prof. Al-Haddad is a fellow member of the Canadian Academy of Engineering. He is IEEE- IES President Elect, Associate editor of the Transactions on Industrial Informatics, and IES Distinguished Lecturer. In 2015, he received the prestigious the Dr.-Ing. Eugene Mittelmann Achievement Award.

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