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Special Session on

**“Impedance Source Converters—Improved Topologies,
Advanced Control, and Emerging Applications”**

Organized by

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Organizer 1: Yushan Liu

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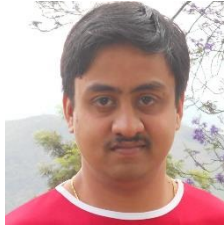
She is an Associate Professor in the School of Automation Science and Electrical Engineering, Beihang University, Beijing, China. She was a Research Assistant, a Postdoctoral Research Associate, and an Assistant Research Scientist in the Department of Electrical and Computer

Engineering, Texas A&M University at Qatar, Doha, Qatar, from 2011. She has published more than 60 journal and conference papers, one book, and one book chapter in the area of expertise. Her research interests include impedance source inverters, cascade multilevel converters, photovoltaic power integration, renewable energy systems, model predictive control, and smart transformers, etc.

Dr. Liu received the “Research Fellow Excellence Award” from Texas A&M University at Qatar, the “Excellent Doctoral Dissertations” Prize from Beijing Jiaotong University, and many other prestigious research awards.

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Nimesh Vamanan received the B.Tech degree in Electrical and Electronics Engineering from College of Engineering, Thiruvananthapuram – Affiliated to Kerala University, Kerala, India in 2004, M.Tech in Power Electronics and Power Systems in Indian Institute of Technology, Bombay, Mumbai, India in 2008, and Ph.D. degree in Electrical Engineering from Indian Institute of Science Bangalore, India in 2018.

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Impedance source converters overcome the boost ratio limitation of traditional solutions in a single-stage topology through embedding a network with inductors, capacitors, and switches/diodes. In addition, it is possible to get rid of the dead time between phase-leg switches thus to enhance the reliability of the entire power system. For this challenging topology, widespread investigations have been performed on improved topologies, modified modulation techniques, advanced control methods, and various applications including electric drives, renewable energy systems, transportation, battery energy storage, etc. The aim of this special session is to concentrate all related contributions on impedance source converters to provide a common environment for presentation and discussion on their emerging research, development, and applications.

Topics of interest include, but are not limited to:

- Improved topologies
- Advanced modulation and control strategies
- Multilevel / Multiphase impedance source converters
- Impedance source isolated/non-isolated DC-DC converters
- Impedance source DC-AC/AC-DC converters
- Fault detection and fault-tolerant control for impedance source converters
- Estimation techniques for impedance source converters
- Impedance source matrix converters
- Wide Band Gap devices implementation in impedance source converters
- Techniques of optimizing impedance source network parameters
- Applications in renewable energy power systems
- Applications in electric vehicles and motor drives
- Application in battery energy storage
- Novel applications