

Talk Title – Novel Power Electronic Converters-topology, modulation and Control for E-Mobility and Smart Grid

Abstract: As the world transitions towards sustainable energy solutions, the integration of electric mobility and smart grid technologies stands at the forefront of innovation. Key to the success of energy transition to achieve net-zero are power electronic converters that facilitate efficient energy transfer, management, and control. This seminar presents some development in the multiphase (>3-phase) and multilevel (>2 Level) power electronic converter topologies, modulation techniques, and control strategies tailored for the unique demands of e-mobility and smart grid applications. From compact and high gain converters enhancing the performance of electric vehicles to grid-connected converters enabling bidirectional power flow, the presentation will discuss the latest trends, challenges, and opportunities in this dynamic domain. The seminar will elaborate i) a single-stage quasi impedance based multilevel inverters for integrating Solar PV system with the utility grid, ii) the novel switched capacitor based multilevel inverter topologies with the aims of reducing the component count and reduced switch stress, iii) High gain DC/DC converter with single input and multiple output, iv) Pole-phase modulation applied to multiphase Induction motor drive to achieve wide speed range drive system



Biodata: **ATIF IQBAL** (Fellow IEEE (USA), Fellow IET (UK), Fellow IE (India)) received the B.Sc. and M.Sc. degrees in Electrical Engineering from the Aligarh Muslim University (AMU), Aligarh, India, in 1991 and 1996, respectively, and Ph.D. degree from Liverpool John Moores University, Liverpool, U.K., in 2006. He received D.Sc. degree (Habilitation) in control, informatics, and electrical engineering from the Gdansk University of Technology, Gdansk, Poland in 2019. He is a Full Professor with the Department of Electrical Engineering, Qatar University, Doha, Qatar, and a former Full Professor of the Department of Electrical Engineering, AMU, Aligarh, India. Dr. Iqbal has been

listed in top 2% highly cited scientists of the world (Stanford University, USA) since 2019. He has published widely in international journals and conferences on his research findings related to power electronics, variable speed drives, e-mobility, smart grid, complex energy transition, micro and nano grids and renewable energy sources. He has authored or coauthored more than 570 research articles, 8 patents, and four books and several chapters in edited books. He has supervised several large research and development projects worth several million USD. He has supervised 21 PhD He was also a recipient of the Outstanding Faculty Merit Award for year 2014–2015 and the Research Excellence Awards at Qatar University, in 2015, and 2022. He has received Research Excellence Award from the College of Engineering, Qatar University in 2019. He has received several best research papers awards in top International Conferences. He is serving as the Vice-Chair of the IEEE Qatar Section. He is an Associate Editor of the IEEE Transaction on Industrial Electronics and Senior Editor IEEE Access.

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