Keynote Talk
At Hamburg University of Technology (TUHH), Hamburg, 13-July-2023
Title: Resilient Energy and Transportation Infrastructures

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Abstract:
This talk will present design and operation scenarios of resilient energy and transportation infrastructures. The talk will discuss development strategies of hybrid charging stations and their integration witihn energy and transportation infrastructures. The design and control strategies of fast charging stations will be presented with hybrid energy storage. Hardware-in-the-loop and real time simulation are used to evaluate the proposed design and implementation scenarios. Integrated nuclear-renewable hybrid energy systems using Small Modular Reactor (SMR) or Micro Modular Reactor (MMR) wihitn micro energy grids are used to achieve resilient energy supply within charging stations. Intergation betweeen hyrdogen and fuel cell systems are demonstrated to achieve hybrid charging stations and support the transition to clean transportation. Transactive mobility will be discussed to support the deployment of charging stations within energy and transportation infrastructures, as integrated with community applications in city, urban, and remote communities. Performance measures are modeled and evaluated for different design and operation strategies. Resiliency and performance measures will be discussed in view of number of operation and control strategies to meet user requirements.

Bio

Dr. Gabbar is a full Professor in the Department of Energy and Nuclear Engineering, the Faculty of Engineering and Applied Science, at Ontario Tech University (UOIT), where he has established the Energy Safety and Control Lab (ESCL), Smart Energy Systems Lab, and Advanced Plasma Engineering Lab. He is the recipient of the Senior Research Excellence Aware for 2016, UOIT. He is recognized among the top 2% of worldwide scientists with high citation in the area of energy. He is a Distinguished Lecturer of IEEE NPSS. He is leading national and international research in the areas of smart energy grids, energy safety and control systems, and waste to energy using advanced plasma technologies. Dr. Gabbar obtained his B.Sc. degree in 1988 with first class of honor from the Faculty of Engineering, Alexandria University (Egypt). In 2001, he obtained his Ph.D. degree from Okayama University (Japan). From 2001 till 2004, he joined Tokyo Institute of Technology (Japan), as a research associate. From 2004 till 2008, he joined Okayama University (Japan) as an Associate Professor, in the Division of Industrial Innovation Sciences. From 2007 till 2008, he was a Visiting Professor at the University of Toronto. He also worked as process control, safety, and automation specialist in energy and oil & gas industries. Dr. Gabbar has more than 230 publications, including patents, books / chapters, journal, and conference papers.