Area: Power and Energy Systems

Host: Prof Dipti Srinivasan

Jointly Organized By:
Green Energy Management and Smart Grid Research Center (GEMS),
Department of Electrical & Computer Engineering, National University of Singapore
and IEEE Power & Energy Society, Singapore Chapter and
IEEE PES National University of Singapore Student Branch

TOPIC	:	**Microgrid Control and Estimation over IoT Communication Networks**
SPEAKER	:	**Mr. Seyed Amir Alavi,** **Research Scholar,** **Electronic engineering at Queen Mary University of London (QMUL)**
DATE	:	**16 May 2019, Thursday**
TIME	:	**2pm to 3.30pm**
VENUE	:	**E3-06-08, Engineering Block E3, Faculty of Engineering, NUS**

ABSTRACT

Microgrids are small sized power systems, which require special attention due to the lower inertia in stability, comparing to the traditional power systems (AC/DC). This requirement shows itself mainly in the control and estimation problems of the microgrids. In this talk, recent research advances of the real-time control and power system (RCPS) group at Queen Mary University of London (QMUL), will be presented from two different but interrelated viewpoints; first estimating the state of microgrid and second, the distributed secondary-layer control problems. The main challenge in finding a solution for the mentioned problems, is accurate modelling and characterization of the communication network, used in both monitoring and real-time control. This modelling of the network should consider the data flow approach (publish/subscribe, query-based, multi-casting, ...), round-trip delays, measurement strategy, and medium access layer (MAC) limitations. Based on this derived characterization, event-triggered distributed control and estimation strategies will be presented in this talk, which consider both the network limitations and the dynamics of the microgrid. Event-triggered strategies, reduces the traffic over the communication network to a great extent, therefore we will be able to use low speed, low power, and cheap Internet of things (IoT) communication protocols for future smart grid, such as LoRaWAN and IEEE 802.11 protocols.

Seyed Amir Alavi received the B.Sc. and M.Sc. degrees in electrical engineering from Power and Water University of Technology (PWUT), Tehran, Iran, and Shahid Beheshti University (SBU), Tehran, Iran, in 2013 and 2017, respectively. He is currently pursuing the Ph.D. degree in electronic engineering at Queen Mary University of London (QMUL). He is the supervisor of the Real-Time Microgrid Lab. at QMUL. He has conducted a number of industrial projects on implementation of smart energy management services based on IoT solutions. He is also working as an embedded systems designer in a London-based electricity company, Voltaware. His research interests include embedded control systems, microgrids, event-based control and signal processing, networked control systems, and WSNs.

https://www.eng.nus.edu.sg/ece/highlights/events/