

**IEEE PES Sri Lanka Chapter and IEEE Sri Lanka Central  
Region Subsection**

**Jointly organizes a talk on**

**“Grid Integration Technologies for Distributed Storage  
Systems”**

By

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**Monday, 10<sup>th</sup> July 2017, 4.00 pm to 5.00 pm**

**@ DEEE Seminar Room, Faculty of Engineering**

**All are Welcome !!!**

**Abstract:** Sustainable generation, transmission and utilization of energy have all become a priority for addressing global concerns in relation to both depletion and irresponsible use of fossil fuel reserves. Various incentives for wider exploitation of renewable energy (RE) resources can be considered as an integral part of this mission. In recent times, decentralized power generation through renewable energy sources at low-medium power levels has gained more popularity and acceptance mainly due to the recognition of economic, social, environmental and sustainability benefits that it offers. A RE system, which typically derives power from wind, solar or biogas, allows the energy to be consumed or grid-connected at or near the point of generation. However, uninterrupted generation of energy through such renewable energy sources can never be guaranteed due to their stochastic nature. Therefore, it is common practice to employ distributed energy storage systems as an essential element to allow for demand management of renewable energy based power networks. Distributed energy storage systems can compose of banks of batteries, a combination of batteries and super-capacitors, or battery storage of electric vehicles (EV). With continual advancements in energy storage technologies, these distributed storage devices are expected to be increasingly used for storage, retrieval as well as sharing of energy in future power networks. In order to successfully implement distributed storage systems for energy storage, retrieval and sharing, they essentially require efficient integration technologies that facilitate bi-directional power flow between the storage devices, loads and energy sources. Consequently, in recent times, a significant amount of research has been carried out in search for effective wired and wireless bi-directional power transfer technologies that are suitable for integration of distributed storage devices into RE systems.

*This seminar intends to introduce novel wired and wireless bi-directional power converter technologies developed at the University of Auckland for integration of distributed storage systems. The fundamental operating principles of these technologies will be explained through examples enabling participants to gain valuable knowledge in relation to design of isolated bi-directional wired and wireless systems. The presentation will conclude highlighting current challenges, future directions and research opportunities.*



**Biography:** Duleepa J. Thrimawithana, received his BE in Electrical Engineering (with First Class Honors) in 2005 and his Ph.D. in power electronics in 2009 from The University of Auckland, Auckland, New Zealand. From 2005 to 2008, he worked in collaboration with Tru-Test Ltd. in Auckland as a Research Engineer in the areas of power converters and high-voltage pulse generator design. He joined the Department of Electrical and Computer Engineering at The University of Auckland in 2009 where he currently works as a Senior Lecturer. He also serves as the Chairman of the Joint Chapter of IEEE Industrial Electronics and Industrial Applications Society, New Zealand (North). He has co-authored over 90 international journal and conference publications, and holds 12 patents on wireless power transfer technologies with several pending. In recognition of his outstanding contributions to engineering as an early carrier researcher, Dr. Thrimawithana received the Jim and Hazel D. Lord Fellowship in 2014. His main research areas include wireless power transfer, power electronics and renewable energy.