Electrical & Computer Engineering

S E M I N A R

Louisiana State University

Power Electronics and Digital Control in Energy Conversion Systems

Venkata Yaramasu

Department of Electrical and Computer Engineering

Ryerson University, Toronto

Abstract—The modern electrical energy conversion systems demand low initial & maintenance cost, high efficiency, high power density, better power quality and high dynamic performance features to conserve electrical energy. These technical and operational requirements are often fulfilled majorly by: (i) semiconductor devices such as Insulated Gate Bipolar Transistor (IGBT) or Gate-Commutated Thyristor (GCT), (ii) power converter configuration with proper arrangement of semiconductor devices possibly with dc-link elements such as capacitors or inductors, and (iii) switch-mode operation through analog or digital control to turn-on and turn-off the semiconductor devices in a power converter.

This seminar provides a comprehensive review on the state-of-the-art and emerging technologies in power electronics and digital control schemes, and their applications to renewable energy (wind and photovoltaic), distributed generation, power quality, electric vehicles, and electric motor drives. The specific topics of this presentation include megawatt-level wind turbines, back-to-back connected converters and passive generator-side converters for low voltage and medium voltage operation of variable-speed wind energy conversion systems, model predictive control of wind energy systems, wind farm configurations based on HVDC technology, fault-ride through operation of wind energy systems, power converter configurations for low-, medium- and high-power photovoltaic energy systems, standalone and grid-connected distributed generation systems, power quality improvement in microgrid, high-power charging station and level III fast chargers for plug-in electric vehicles, and medium voltage motor drives.

Bio—Venkata Yaramasu received his B.Tech degree in electrical and electronics engineering from Jawaharlal Nehru Technological University, Hyderabad, India, in 2005, an M.E. degree in electrical engineering with specialization in power electronics from S. G. S. Institute of Technology and Science, Indore, India, in 2008, and Ph.D. degree in electrical engineering from Ryerson University, Toronto, Canada, in 2014. He is currently a Postdoctoral Research Fellow at the Laboratory for Electric Drive Applications and Research (LEDAR) and Center for Urban Energy (CUE), Ryerson University. His research interests include renewable energy (wind and photovoltaic), high power converters, electric vehicles, power quality, and model predictive control.

Dr. Yaramasu worked closely with Rockwell Automation, Toronto Hydro, Hydro One, Natural Sciences and Engineering Research Council of Canada (NSERC), Wind Energy Strategic Network (WESNet) and Connect Canada, and completed 8 industrial projects in Power Electronics, Electric Drives and Renewable Energy. He has published more than 30 peer-reviewed technical papers including 19 journal papers. He is currently authoring/coauthoring two books entitled Model Predictive Control of Wind Energy Conversion Systems and Power Conversion and Control of Wind Energy Systems, Second Edition for a possible publication with the Wiley-IEEE Press. He is recipient of Best Graduate Thesis Award (2014), Three Best Poster Awards (2010, 2013), Three Graduate Research Excellence Awards (2012, 2013, 2014), Three Student Research Awards (2010, 2012, 2013), Six Best Student Paper Awards (2003-2005) and Two Teaching Related Awards (2006, 2010).

When: **Thursday, 16 April 2015, 9:30 - 10:30**
Where: **Room 117 EE Building**
Info: `http://www.ece.lsu.edu/seminar`