**ECE Seminar**

**Thursday, January 16, 2014 9:30-10:30 101 ATRC**

***Refreshments and discussion after***

**Topic: Multi Agent System Applications in Smart Grids**

**Abstract:** World-wide CO2 reduction target affected the energy sector which brought the smart grid initiatives with clean energy technology and brought the fundamental change in the way the electricity was generated and distributed to the load. Wind power, solar power, fuel cell power, bio power, tidal and wave power are some of these clean energy sources which are being installed near load centers with advanced communication and measurement technology. Integration of these new technologies in electric grid has lead to many challenges and some of these challenges can be addressed by application of Multi-Agent Systems. A fast and efficient decentralized service restoration scheme with a load shedding method for distribution systems and ship systems, considering priority of customers and several other system operating constraints is developed. The scheme based on agents, which are software abstractions and have

only local knowledge of the system. A group of agents created to realize a specific goal by their

interactions is called a Multi-Agent System (MAS). Results presented are among the first to demonstrate a state-of-the-art MAS for load shedding under islanded conditions and restoration of the shed loads. Modified Space Vector Modulation (SVM) scheme for three phase three wire active power filter to compensate for harmonics generated due to nonlinear loads in Shipboard Power Systems (SPS) will also be discussed. Advanced optimization and intelligent multi step MAS based decentralized algorithm for the control of smart microgrid for real-time applications will be discussed. The talk will also include data mining algorithms for system state recognition, vulnerability assessment to identify critical elements for providing the security, scalability and performance for power system operation.

**Biography:** Jignesh Solanki received B.E. from V.N.I.T, Nagpur, India and M.E. degree from Mumbai

University, India in 1998 and 2000 respectively. He received the Ph.D. degree in Electrical and Computer

Engineering from Mississippi State University, USA in 2006. Currently he is Research Assistant

Professor in Lane Department of Computer Science and Electrical Engineering at West Virginia

University, Morgantown, WV. He was also a Research Assistant at IIT Bombay, India and Senior

Engineer at Open Systems International Inc, Minneapolis, MN. His research interests are smart grid,

multi-agent applications in power systems, demand response and power system control. He has been an

active contributor in the student activities sub-committee of IEEE Power and Energy Society (PES) and

currently a vice-chair for the same subcommittee, served as session chair at IEEE conferences and

reviewer for several journals, conferences and panels nationally and internationally. He has also served on

several panels for National Science Foundation and Department of Energy. He received IEEE PES multiagent

systems working group award in 2008 and IEEE PES technical student activities working group

award in 2012 and is a member of IEEE since 2002.

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