

THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING SPEAKER SERIES

PRESENTS

Power Electronics Intelligence at the Network Edge (PINE)

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LECTURE ABSTRACT

This presentation puts forth a vision for scalable distribution grid- integration of energy resources such as rooftop photovoltaic (PV) and electric vehicles (EVs). These resources vary their output intertemporally in an unpredicted manner. Therefore, they bring substantial challenges to utilities for massive deployment of such resources. By leveraging the fact that most of the distributed energy resources are interfaced with power electronics converters, we propose a fully decentralized architecture for achieving the main objectives of utility companies, namely, (1) end user voltage regulation; and (2) delivery system loss minimization. The proposed framework provides a bottom up approach to integrating many such distributed resources without substantial capital investment. This framework, termed as Power Electronics Intelligence at the Network Edge (PINE), provides a possible pathway towards very high level of PV and EV penetration in future distribution systems. Operational benefits to users and utilities are elaborated.

SPEAKER BIOSKETCH

Prasad N. Enjeti (M'85-SM'88-F'00) received his B.E. degree from Osmania University, Hyderabad, India, in 1980, the M.Tech degree from Indian Institute of Technology, Kanpur, in 1982, and Ph.D. degree from Concordia University, Montreal, Canada, in 1988, all in Electrical Engineering. He is a member of Texas A&M University faculty since 1988 and is widely acknowledged to be a distinguished teacher, scholar and researcher. Up until now, he has graduated 31 PhD students and 14 of them hold academic positions in leading Universities in the world. He along with his students has received numerous best paper awards from the IEEE Industry Applications and Power Electronics Society. His primary research interests are in advancing power electronic converter designs to address complex power management issues such as: active harmonic filtering, adjustable speed motor drives, power conditioning systems for fuel cells, wind and solar energy systems.

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