

ECE Distinguished Lecture Series



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Cyber Physical System Security of the Power Grid

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Zoom Link: <https://gwu-edu.zoom.us/j/98484240096>

Abstract:

The electric power grid is a complex cyber-physical system that forms the lifeline of a modern society. Its reliable and secure operation is of paramount importance to national security and economic well-being. The power grid today is a highly automated network, wherein a variety of communication networks and information systems are interconnected to the physical grid for the purpose of monitoring, protection, control, and market functions. The increased reliance on information and communications technology in the smart grid significantly increases the vulnerabilities with respect to various cyberattacks, such as falsification of control commands and measurement-based attacks. The purpose of this presentation is to provide new analytical and testbed-based methodologies for the integrated cyber-power systems. Cyber security of the power grid involves vulnerability assessment, anomaly detection, and mitigation for the substations and Supervisory Control and Data Acquisition (SCADA) systems. Cyber intrusion scenarios for distribution systems include renewable facilities, smart meters, and remote-control devices. In the future, the fast increasing deployment of grid edge devices will require a high security/privacy environment for distributed decision making by numerous agents.

Biography:

Chen-Ching Liu is American Electric Power Professor and Director, Power and Energy Center, at Bradley Department of Electrical and Computer Engineering, Virginia Tech. Prior to joining Virginia Tech, Dr. Liu served as Boeing Distinguished Professor at Washington State University from 2011-2017. During 1983-2011, he was on the faculty of University of Washington, Iowa State University, and University College Dublin, Ireland. Professor Liu received an IEEE Third Millennium Medal and the PES Outstanding Power Engineering Educator Award. Dr. Liu received a Doctor Honoris Causa from Polytechnic University of Bucharest, Romania. He chaired the IEEE PES Fellow Committee, Technical Committee on Power System Analysis, Computing and Economics, and Outstanding Power Engineering Educator Award Committee. Professor Liu is a Fellow of the IEEE and U.S. Representative on CIGRE Study Committee D2: Information Systems and Telecommunication. He is a Member of the U.S. National Academy of Engineering.