

*Holcombe Department of Electrical and Computer Engineering
Seminar Series*

Security of Cyber Physical Systems: A Control Oriented Perspective

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Abstract

Cyber Physical Systems (CPS) are physical and engineered systems whose operations are monitored, coordinated, controlled and integrated by a computing and communication core. These systems have many applications in critical infrastructures such as smart grid, transportation and manufacturing. Wireless communication and connectivity play significant roles to enhance the efficiency and performance in the aforementioned infrastructures. However, emerging new technologies and everyday growing hacker capabilities introduce great challenges for maintaining cyber physical systems reliability and security.

This presentation will provide an overview of the work performed in this area by the research group led by Dr. Pisu. Specifically, we will describe how we focus on control oriented solutions to enhance the cyber security of cyber physical systems with application in connected vehicles including the development of testbeds for virtual and vehicle-in-the-loop experimental validation. Furthermore, we will present some future research directions and potential collaboration activities with faculty for future research opportunities.

Biography of Speaker

Dr. Pierluigi Pisu is an Associate Professor of Automotive Engineering in the Carroll A. Campbell Jr. Graduate Engineering Center at the Clemson University International Center for Automotive Research with a joint appointment in the Holcombe Department of Electrical and Computer Engineering at Clemson University. Dr. Pisu is the faculty elected Leader of the Connected Vehicle Technology Faculty Research Group in the College of Engineering and Science and the Leader of the Deep Orange 8 Program. He is the Director of the DOE GATE Hybrid Electric Powertrain Laboratory and the Creative Car Laboratory. Dr. Pisu has a Ph.D. in Electrical Engineering from The Ohio State University and a M.S. in Computer Engineering from the University of Genoa, Italy. His research interests lie in the area of functional safety, security, control and optimization of Cyber-Physical Systems for next generation of high performance and resilient connected and automated systems with emphasis in both theoretical formulation and virtual/hardware-in-the-loop validation. Dr. Pisu current and past research applications include connected and automated vehicles, large scale power systems, heating ventilation and air-conditioning systems, human/autonomous vehicle interaction, electro-chemical systems (batteries and PEM fuel cells), hybrid electric powertrains, electric buses and electric golf cars, robot manipulators, wind turbines, steer-by-wire and brake-by-wire systems.