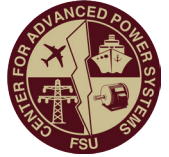


ELECTRICAL & COMPUTER ENGINEERING SEMINAR ANNOUNCEMENT



Embedded operationalized intelligence and control for optimized and resilient energy systems

Humberto E. Garcia, Ph.D.
Directorate Fellow and Senior Technical Advisor
Idaho National Laboratory

Thursday, Oct. 26
3:30 p.m.
Room 120, CAPS



Dr. Humberto Garcia
Directorate Fellow,
Senior Technical Advisor
Idaho National Laboratory

Dr. Humberto Garcia is a Directorate Fellow and Senior Technical Advisor at Idaho National Laboratory, currently with the Systems Science and Engineering division. His work revolves around intelligent monitoring, control and supervision for complex systems (incl. advanced energy systems, critical infrastructures and low-carbon-centered energy grids, as well as national security and nuclear non-proliferation applications). Particular research efforts pertain to the topic of secure embedded intelligence (SEI) involving the secure use of computational intelligence, digital twins, and systems theories together with control, data analytics, and optimization methods for estimating the state of complex systems, understanding its conditions (e.g., health and risk), and taking informed and proactive predictive decisions and actions related to their reliable, efficient, safe, sustainable, and resilient (autonomous) operations. His research work at INL has been and is supported by multiple sponsors. Dr. Garcia has published more than 140 peer-reviewed publications and received multiple awards and recognitions, including having been recently selected as the 2023 Great Minds in STEM, HENAAC (Hispanic Engineer National Achievement Awards Conference) Winner for Outstanding Technical Achievement.



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This seminar will introduce recent and ongoing RD&D activities being conducted at the U.S. Department of Energy Idaho National Laboratory centered around the operationalization of systems theories, artificial intelligence, digital twins, control, and optimization to support the deployment of resilient and intelligent energy structures, systems, and components. Contrary to traditional paradigms of monolithic and manually-operated energy systems, the capabilities and technologies being developed under our INL secure embedded intelligence (SEI) initiative are intended to enable the delivery of energy systems that can timely reason on their present and mission-projected future, understand their current and predicted health and risk states, and take informed decisions and optimized actions in complex decision and action spaces. Given a rapidly evolving energy domain defined by electrification, renewable energy, smart functionalities including autonomy, predictive maintenance, and self-improvement as well as by tactical and cyber-physical security threats, the seminar concludes with suggestions for future work and collaborative efforts towards potential areas of common interest.