

EEE Research Seminar

Date: November 7, 2023, at 10:30 AM

Location: POTR 234 (Fu Room)

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The University of Texas at San Antonio
San Antonio, Texas



Integrated Data Analytics Scheme to Enable Energy Efficient Secure Manufacturing and Energy Systems

Abstract

This talk presents an overview of a research portfolio focused on the creation of novel data-driven mathematical models that consider the stochasticity and risk in complex systems, and the development of efficient algorithms, to compute optimal and near-optimal solutions for large-scale scenarios. The application domains highlighted during this seminar include energy-efficient cybersecure manufacturing processes and optimization of energy systems. This talk will also focus on the Cybersecure Energy & Emissions Quantification (CEEQ) scheme, which allows secure real-time/near-real-time data retrieval from a variety of smart sensors and Industrial Internet of Things (IoT) devices to feed energy analytics methods and enable energy efficient manufacturing processes and supply chain networks. The modeling, design and optimization of cost-effective manufacturing systems integrating energy efficiency, emissions and cybersecurity aspects has the potential to be transformative and greatly revolutionize the way that digital manufacturing is executed in the United States.

Bio

Dr. Krystal Castillo is currently the Lutcher Brown Chair in the Department of Mechanical Engineering and Director of the Texas Sustainable Energy Research Institute (texasenergy.utsa.edu) at The University of Texas at San Antonio. Dr. Castillo serves as VP for Energy Efficiency for the Cybersecurity Manufacturing Innovation Institute (CyManII), a \$130 M (including cost share) center funded by the Department of Energy. Her research expertise is in Data Analytics and Operations Research; specifically, mathematical programming and optimization techniques for analyzing large-scale, complex systems under uncertainty. Her research is grounded in relevant applications such as modeling and optimization of clean and sustainable energy systems, cybersecure manufacturing, and supply chain network design. Dr. Castillo has received more than \$11 million in grant funding from multiple agencies including USDA, DOE, NSF, EPA, Air Force, Office of Naval Research, among others. She is a member of INFORMS, IISE and ASEE. She received her Ph.D. from Texas Tech University and her Sc.D. from Monterrey Tech.