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CECS Seminar



"Autonomy on a Budget: Enabling Intelligent Monitoring Through Low-Cost Embedded Systems"

Dr. Prabha Sundaravadivel

Professor, University of Texas at Tyler

Tuesday, November 4th
2:00-3:00 p.m.
Location: EH 2430

Abstract:

The next generation of environmental monitoring frameworks demands intelligent, autonomous systems that are affordable, scalable, and resilient. However, high-performance autonomy has traditionally relied on expensive sensors and computational hardware, limiting deployment in resource-constrained or remote environments. This talk presents recent advances in low-cost embedded autonomy, where edge AI, sensor fusion, and adaptive control enable real-time decision-making within compact, power-efficient platforms. Drawing on case studies from underwater robots, UAV-based agricultural monitoring, and IoT-enabled field systems, the discussion will highlight how autonomy can be achieved through cost-aware design, leveraging open-source tools, lightweight deep learning models, and modular architectures. The presentation will also explore challenges in integrating computer vision, localization, and control on embedded hardware, and propose pathways toward scalable, intelligent monitoring frameworks for environmental and industrial applications.

Biography:

Dr. Prabha Sundaravadivel received her Ph.D. in Computer Science and Engineering from the University of North Texas (UNT), Denton, in 2018. She earned her B.Tech in Electronics and Communication Engineering from SRM University, Chennai, in 2011, and her M.Tech in VLSI Design from VIT University, India, in 2015. She is currently working as an Associate Professor in the Department of Electrical and Computer Engineering at the University of Texas at Tyler, Tyler, Texas, USA. She leads a multidisciplinary research group as the Director of the Center for Robotics and Intelligent Systems (CeRIS), mentoring graduate, undergraduate, and high school students. Her team has received multiple accolades, including Best Paper, Poster and Pitch awards, at both regional and international conferences sponsored by IEEE and ACM.

Her research has led to successful funded projects totaling over $1.7 Million from organizations like NSF, NASA, Oracle, USDA, and the Venturewell Foundation. Her research is in the emerging areas of the Internet of Things (IoT), on-device learning, bio-inspired robotics, Agricultural Robotics and Applied ML. Dr. Sundaravadivel has been recognized as a "Faculty Scholar" at the 2019 Grace Hopper Celebration for Women in Computing and 2022 ACM Richard Tapia Conference and was named as "Innovation Fellow" by Venturewell Foundation in 2023. In 2022, she was recognized as "Outstanding Early Career Researcher" in the IEEE Bio-Inspired Technical Community.

Hosted By: Prof. Mohammad Al Faruque