



Georgia Tech

Georgia Electronic
Design Center

Distinguished Lecture Series

Frontiers in RFID-Sensing: Evolution, Advancements and Opportunities in the IoT Era



Featuring **Luca Catarinucci**
Associate Professor
at University of Salento, Italy

Tuesday, February 13, 2024
12:15 p.m. - 1:15 p.m.
Location: Clough Commons (272)

Abstract: This talk will explore the evolution and future potential of RFID-Sensing, aiming to inspire young researchers to venture into the field of RFID and RFID-Sensing. Drawing from the extensive research at the Department of Innovation Engineering of the University of Salento, the talk will cover 15 years of advancements in integrating UHF RFID technology with sensors, alongside projections for future concepts in the realm of emerging technologies.

The session will begin by tracing the evolution from initial multi-ID approaches to the creation of sophisticated, self-powered RFID platforms enhanced with sensing and computational capabilities. This includes exploring innovative concepts that leverage antenna/chip mismatching for zero-power sensing of various parameters. Special emphasis will be placed on the practical applications and projects within the Internet of Things (IoT) ecosystem that have been enabled by these technological advancements. Additionally, the talk will delve into the role of RFID-sensing in the world of emerging technologies. This includes our first experiments in zero-power, RFID-inspired backscattering modulation at around 10 GHz, which promise to enhance identification and sensing capabilities in ubiquitous technologies.

A significant highlight will be the recent breakthroughs in reducing the cost of RFID/IoT devices through 3D-Printing techniques. These advancements not only represent a leap in manufacturing efficiency but also open new avenues for research and application in various sectors.

Bio: Luca Catarinucci is an associate professor in electromagnetic fields at the Department of Innovation Engineering, University of Salento, Italy, and holds the chairs of "Microwaves" and "Electromagnetic Solutions for Hi-Tech". He leads a dynamic Research Group with a keen focus on RFID and cutting-edge electromagnetic technologies in the realm of IoT. His research also encompasses the deployment of advanced electromagnetic simulation tools, the electromagnetic characterization of diverse materials, and the application of time-domain reflectometry for the qualitative and quantitative assessment of fluids. A significant part of his current research is deeply rooted in RFID-related pursuits, spanning across a broad spectrum including antenna and system design, the seamless integration of sensors and RFID tags, innovative strategies for RFID-based robot navigation, and pioneering methods for tag characterization, optimization, and design. His collaborations extend to numerous research teams, delving into areas such as antenna arrays, the manufacturing of antennas, the role of 3D-Printing in electromagnetics, among others.

Catarinucci authored over 200 papers in international journals and conferences, and four chapters in internationally recognized books. He is also the co-inventor of two patents, showcasing his commitment to practical and innovative applications in his field. In his professional journey, Catarinucci chairs the IEEE Technical Committee on Additively Manufactured Electronic Systems. He held the position of Vice President of Technical Activities at the IEEE Council on RFID (CRFID) for the 2022-23 tenure. As of now, he is the President-Elect of the IEEE Council on RFID for the 2-year term 2024-25.

Host: Gregory Durgin

Pizza and soda will be available before the seminar