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UF/IFAS AI AND DATA SCIENCE SEMINAR SERIES

WEDNESDAY, MARCH 26, 2025
12:00P.M. - 01:00P.M.

ZOOM:
https://go.ufl.edu/5g8w7ep

Integrating AI and Robotics for Enhanced Crop Management

DR. YIANNIS AMPATZIDIS

Advancements in robotics and artificial intelligence (AI) are revolutionizing specialty crop management, enabling more sustainable and efficient agricultural practices. This talk will highlight cutting-edge technologies such as Agroview, Agrosense, and robotic systems that drive precision agriculture. Agroview (https://www.agroview.ai) leverages UAV-acquired RGB and multispectral imaging with advanced AI-based algorithms to provide actionable insights into canopy size, plant health, nutrient deficiencies, and spatial variability. These insights enable targeted interventions, such as prescription maps for nutrient optimization in citrus production. Agrosense complements Agroview as an AI-enabled ground-based sensing system for orchard management, offering capabilities like tree crop counting, canopy density classification, tree height estimation, and fruit counting. Additionally, innovative robotic systems, such as a smart tree crop sprayer, a robotic weed management sprayer, and an automated needle-based trunk injection system for HLB-affected citrus trees use real-time detection and targeted input application to reduce chemical use and labor needs. Furthermore, early disease detection is another transformative area, where AI-enhanced hyperspectral and multispectral analysis identifies symptomatic and asymptomatic signs of plant diseases. UAVs equipped with advanced sensors facilitate rapid and accurate disease monitoring, enabling timely interventions to prevent outbreaks and minimize crop loss. By integrating AI, robotics, and advanced sensing technologies, this presentation will showcase practical applications, deployment strategies, and their potential to address critical challenges in specialty crop management. Attendees will gain insights into how actionable, plant-based data from tools like Agroview and Agrosense and other robotic technologies optimize resource use, enhance productivity, and support a sustainable and resilient food system.

BIO

Dr. Yiannis Ampatzidis is an Associate Professor in the Agricultural and Biological Engineering Department at the University of Florida (UF) and leads the Precision Agriculture Engineering program at the Southwest Florida Research and Education Center (SWFREC). His research focuses on smart and digital agriculture, artificial intelligence (AI), UAVs, machine vision for plant stress and disease detection, mechatronics, automation, robotics, precision agriculture, and machine systems. He is particularly interested in developing, implementing, and evaluating advanced agricultural machines and control systems for high-value crops. Dr. Ampatzidis serves as an Associate and Special Content Editor for Computers and Electronics in Agriculture and as an Associate and Guest Editor for several other leading scientific journals.