Presentation Title

Advancing Florida's Specialty Crop Production and Harvesting using Mechanization, Precision Agriculture, Drones, Robotics, and Artificial Intelligence

Presentation summary

Mechanization, automation, and robotics have impacted a broad sector of Florida agriculture in the past century ranging from new tractors, implements, spraying technologies, planting systems, and harvesting platforms which have been applied to the full specter of crops such as fruit and vegetable production, sugar cane, row crops, nursery production, and animal production. UF ABE faculty have led research programs in tomato, citrus, strawberry, and blueberry harvesting using conventional and robotic harvesting approaches. ABE has also been involved in projects involving new sprayer technologies for citrus, vegetables, and greenhouses, as well as autonomous platforms for citrus, strawberry, and greenhouses.

Precision Agriculture seeks to improve resource utilization, crop health, productivity, and profitability across a broad sector of Florida agriculture using geo-spatial mapping of numerous crops, soil fertility, moisture, yield, and other characteristics to optimize production operations such as precision spraying, planting, harvesting, and irrigation. UF ABE faculty have a long history in leading precision agriculture research in citrus, silage, blueberry, and strawberry yield mapping; detection and prediction of crop nutrient and soil properties; citrus, tomato, and apple disease detection; grain insect detection using near-infrared spectroscopy; strawberry plant wetness detection; and strawberry maturity and bruise detection.

Aerial drones, autonomous scouts and post-harvest vision-based inspection monitor Florida's agriculture crops and natural resources for threatening diseases, pests, nutrient overload, and crop phenotype and production markers. UF ABE faculty have for decades worked on innovative approaches for using machine vision-based systems for pre and post-harvest crop inspection, including citrus and vegetable diseases in the canopy and on the fruit pre/post harvest. Systems have employed aerial drone-based inspection, ground based mobile platforms, and fixed grading and sorting in the field and in the packing houses. Novel AI- and cloud-based technologies (e.g., Agroview) have been developed to automatically process, analyze, and visualize aerial and ground collected data to help growers to take informed decisions. These systems can convert data into practical information and could revolutionize the specialty crop industry.

In this seminar Drs. Burks, Lee, and Ampatzidis will explore 100 years of excellence in research by UF ABE faculty on introducing Mechanization, Robotics, Precision Agriculture, and Crop Inspection technologies to Florida Agriculture. They will also look forward into where new opportunities may lie for Florida Agriculture as new technologies emerge and existing technologies mature.