

Purdue ABE's New Plant Sensor Technologies for Improved Crop Phenotyping Quality

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Abstract

Plant phenotyping technologies have been developing rapidly over the last 2 decades. Plant sensors are becoming more accurate, faster, and easier to use. However, there are still bottleneck issues in plant sensing, including the changing environmental conditions, the plant's diurnal activities, and the complicated Genotype-by-Treatment-by-Environment interactions. These issues keep plant phenotyping difficult and limit further application of the sensor technologies in precision agriculture. The Purdue Ag Engineers have been working innovatively to develop the next generation sensor technologies to address these issues. In this presentation, Dr. Jin will firstly introduce the four automatic high-throughput phenotyping facilities recently developed at Purdue and explain why they were built and how they've been successfully used in detecting diseases, nutrients deficiencies, and chemical damages. He will then introduce ABE's most recent plant sensor technologies, including the 2021 Davidson Prize winner, LeafSpec, and the new drone and ground-based robots for automatic field phenotyping in different scenarios. Dr. Jin will also briefly share some discovery stories in plant phenotyping, such as how the crop images diurnal variances, and how to leverage the advantages of remote sensing and proximal sensing.

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