PURDUE UNIVERSITY | College of Agriculture

SEMINAR		2019
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Photogrammetry & Computer Vision Applied to Phenomics

Precise and functional phenotyping is a limiting factor for crop genetic improvement. However, because of its ease of application, imagery-based phenomics represents the next breakthrough for improving the rates of genetic gains in field crops. Currently, crop breeders lack the know-how and computational tools to include such traits in breeding pipelines. A fully automatic user-friendly data management together with a more powerful and accurate interpretation of results should increase the use of field high throughput phenotyping platforms (HTPPs) and, therefore, increasing the efficiency of crop genetic improvement to meet the needs of future generations. The aim of this study is to generate a data fusion methodology to high throughput phenotyping from 2D and 3D information; based on temporal multispectral imagery (MSI) and visible data (RGB) collected from Unmanned Aerial Systems (UAS) in soybean crops. The approach will be developed in a novel and innovative way, ensuring flexibility and simplicity in data acquisition, automation in the process and high-quality results, using low-cost sensors. The non-invasive system proposed allows the determination of biophysical models and physiological growth analysis by combining close-range photogrammetry (quality) and computer vision (flexibility, automation and efficiency).

Monica Herrero Huerta is a research staff member at Purdue University for the Department of Agronomy developing Analytical Tools for Drone-based Canopy Phenotyping in Crop Breeding. Her research interests to date has been focused primarily on close-range hyperspectral photogrammetry and LiDAR by alternative platforms and specifically in computer vision and deep learning analysis by multi-sensor data fusion applied to agro-forestry and plant science. All of her research can be found at **monicaherrerohuerta.webnode.com**

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