

Ismaila Olaniyi¹, I Olaniyi², J Jung², S Bogati³, and D R Wang³

¹Affiliation not available

²Lyles School of Civil Engineering, Purdue University

³Agronomy Department

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Extraction, Analyses, and Validation of Phenotypic information of soybean (*Glycine max* L.) using Unmanned Aerial System-derived datasets.

I. Olaniyi¹, J. Jung¹, S. Bogati², and D.R. Wang²

¹Lyles School of Civil Engineering, Purdue University, 550 Stadium Mall Drive, West Lafayette, IN 47907-2051, USA

²Agronomy Department, 915 W State St, West Lafayette, Indiana, 47906, USA

ORCID: [<https://orcid.org/0000-0001-6665-6094>]

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Plant phenotyping has been an essential aspect of crop science analytics that is saddled with tasks such as providing critical information about plants' genetics, traits, productivity, and other intricate details to gain insights about their survival under certain conditions and in a specific environment for various analyses.

Various methods have been quantifying this information using various models culled from several kinds of datasets. In this study, we extract various phenotypic information about the soybean using UAS-based images captured over the growing fields within the selected experiment field. The DJI M300 unmanned aerial systems were equipped with the Zenmuse P1 and L1 sensors; both used to capture RGB and LiDAR images. In addition, the DJI P4 multispectral UAS was also used to collect multispectral information over these fields at various date intervals.

The data captured is being processed using custom-developed algorithms and automated workflows to obtain biomass, vegetation indices, canopy cover, canopy height, and canopy volume. These indices would show variations in the traits of the crop under study as related to the soybean. This phenotypic information would be compared against the field measurements for validation.