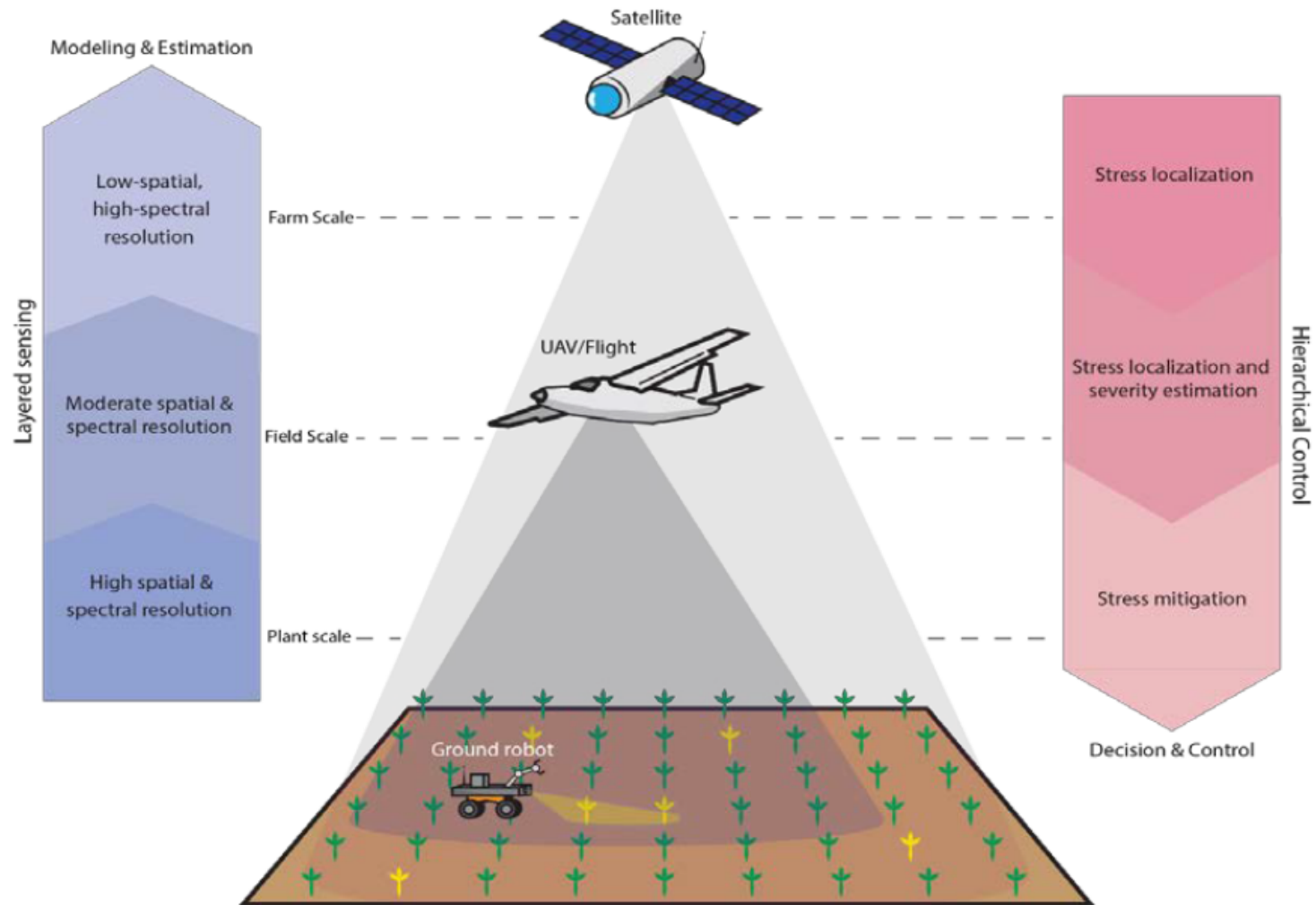




A multi-scale data assimilation framework for layered sensing and hierarchical control of disease spread in field crops

- PI: Soumik Sarkar, Co-PI: Baskar Ganapathysubramanian, Arti Singh, Asheesh Singh
- Iowa State University
- <http://web.me.iastate.edu/soumiks>
- soumiks@iastate.edu
- AWARD # 1646523

Description



- 1 - Effectively extract hierarchical actionable information from multi-length/time/frequency scale data
- 2 - Build an efficient decision support system for early detection and mitigation of row crop diseases

Findings

- Explainable deep learning for plant stress identification, classification and quantification (I-C-Q)

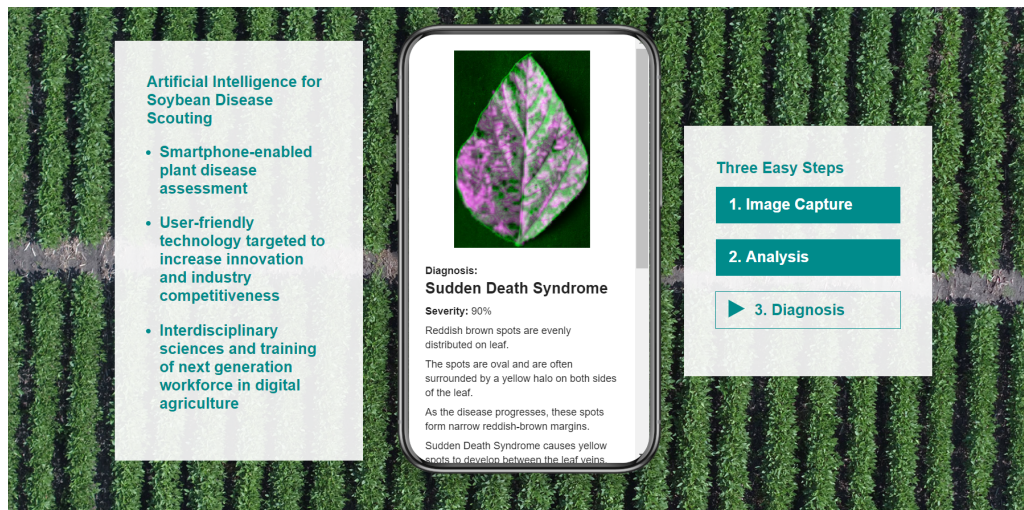
S. Ghosal, D. Blystone, A. K. Singh, B. Ganapathysubramanian, A. Singh and S. Sarkar, “An explainable deep machine vision framework for plant stress phenotyping”, **Proceedings of the National Academy of Sciences of the United States of America (PNAS)**, May 1, 2018. 115 (18) 4613-4618.

- 3D deep learning for hyperspectral data

K. Nagasubramanian, S. Jones, A. K. Singh, S. Sarkar, A. Singh, B. Ganapathysubramanian, *Plant disease identification using explainable 3D deep learning on hyperspectral images*, **Plant Methods** 15.1 (2019): 1-10.

- Weakly supervised and active learning

S. Ghosal et al., *A weakly supervised deep learning framework for sorghum head detection and counting*, **Plant Phenomics (a Science Partner Journal)**, vol 2019, Article ID 1525874, 14 pages, 2019.



Plant disease detection app



Outreach/dissemination: MLCAS