CPS: Medium: Collaborative Research: Field-scale, single plant-resolution agricultural management using coupled molecular and macro sensing and multi-scale data fusion and modeling

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https://portal.nifa.usda.gov/web/crisprojectpages/1022122-cps-medium-collaborative-research-field-scale-single-plant-resolution-agricultural-management-using-coupled-molecular-and-macro-sensing-and-multi-scale-data-fusion-and-modeling.html

Challenge:

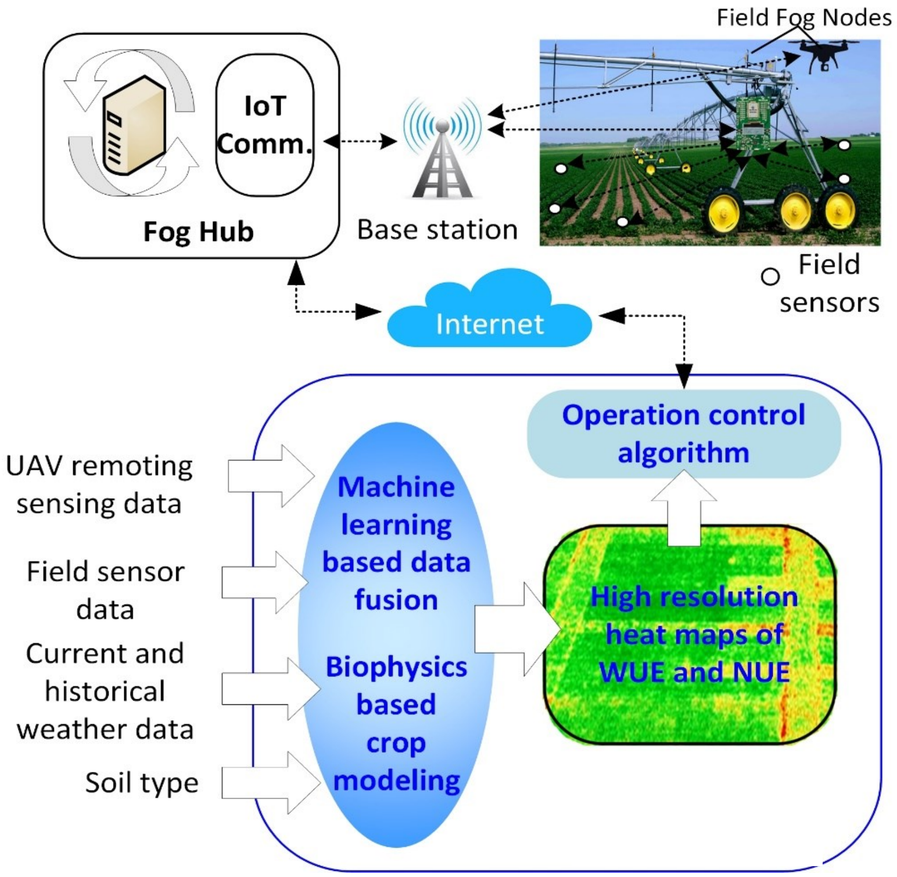
- Lack a platform that can perceive and respond to varying conditions and crop responses across agricultural fields, and can decide agricultural responses to optimize trade-offs between overall yield, water use efficiency, and nitrogen use efficiency.

Solution:

- Fuse UAV-based multiple-time and -space scale data of the geographically mapped spectral images and the point sensor outputs to infer the nitrogen and water dynamics
- Extract actionable information for decision-making of fertilization and irritation scheduling.

Broader Impact:

- Decrease the environmental impact (from N run off).
- Reduce water use.
- Increase farmer profitability, improving the economic viability of rural economies.
- Train the next generation of scientists through existing STEM programs.



Scientific Impact:

- A toolkit for field measurement of nitrogen, transpiration, and soil water potential.
- A data-driven decision support platform to provide actionable information on optimal agricultural management.

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