Undergraduate Research Assistant Opening in Digital Agriculture

2/2/2023

The Nutrient Management Spear Program (NMSP) at Cornell University is recruiting an enthusiastic undergraduate research assistant (immediate filling). The individual will join a research project in digital agriculture focusing on yield data processing, developing web-based statistical tool/reporting, and applying machine learning models on geospatial data. The intern will work with drone image training models to predict corn silage and grain yield prediction using aerial and satellite images.

Project summary

The "Yield monitor" system is an expensive yield recording gadget that is equipped with modern-day combine harvesters and forage choppers. This equipment logs biomass and moisture content at each GPS location within the field, typically at 1-second intervals. Collecting yield data at the subfield level help identify low-yielding areas, evaluate the performance of strip trials, and build a yield and nutrient balance database for a farm to inform nutrient management decisions. However, yield monitor equipment is expensive, and ownership is typically limited to larger farms and custom operators. In addition, collecting accurate yield data can be challenging as it requires in-field calibration and data cleaning. Current research evaluates if/how remotely sensed images obtained with unmanned aerial systems (drones) and satellites can be used to estimate corn grain and silage yields.

Job description

The selected individual will be trained to clean yield monitor data, assist in drone data collection as a visual observer, process aerial imagery using geographical information system (GIS) software, and extract vegetation indices from imagery. Along with aerial imagery, other data layers (elevation maps, climate, and soil information, past yield data, on-farm trial results, gridded soil measurements, etc.) will be explored. The student is expected to perform data processing and analyses in R or Python. They will also explore and apply machine learning models with the goal of developing yield maps, yield stability zones and assessing their prediction accuracy. The student will aid in web-based tool development using R Shiny. The intern will work directly with a postdoctoral researcher and the data analyst/researcher in our team.

Skillset requirements

Currently pursuing a BS degree in Mathematics, Computer Science, Statistics, Agricultural Sciences, or any related STEM field preferred. Experience in programming languages, such as R and/or Python is required. Applicants should be highly motivated, detail-oriented, and interested in learning about zone/yield evaluation and tool development in a production agriculture context.

Interested?

Email Dr. Quirine Ketterings at qmk2@cornell.edu. Please include your resume and explain why you are interested in pursuing this opportunity. We are looking for a student to join us right away (work around class schedules), with the possibility of a full-time summer internship as well.