Undergraduate Research Assistant Opening in Digital Agriculture

1/17/2022

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 with a particular focus on developing and applying machine learning models for corn silage and grain yield prediction using aerial and satellite images.

Project summary

Corn yield is currently being estimated with yield monitors, sensor equipment installed on forage and grain harvesters that log biomass and moisture content of yield at each GPS location within the field (typical 1-second intervals). 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 post-harvest data cleaning. Current research evaluates if/how aerial images obtained with unmanned aerial systems (drones) and satellites can be used to estimate corn grain and silage yields. If accurate predictions can be obtained, an approach can be designed to give all corn growers access to reliable yield data.

Job description

The selected individual will be trained to clean yield monitor data, process aerial imagery using geographical information system (GIS) software, and to extract vegetation indices from imagery. Along with aerial imagery, other data layers (elevation maps, past yield data, on-farm trial results, gridded soil measurements, etc.) will be explored. The intern will work directly with a postdoctoral researcher and the data analyst/researcher in our team. The student is expected to perform data processing and analyses in R. They will also explore and apply different machine learning models with the goal of developing yield estimation approaches and assessing their prediction accuracy.

Skillset requirements

Currently pursuing a BS degree in Mathematics, Computer Science, Statistics, or any related STEM field preferred. Experience in programming languages, such as R and/or Python, required. Applicants should be highly motivated, detail-oriented, and have an interest in learning about yield evaluation 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.

Cornell University

Nutrient Management Spear Program