**Project 1: Determining Plant Water Stress Damage Point Via Wilting Metrics From Top View Images of Potato Fields**

PURPOSE

* Growing demand for more water efficient systems to reduce water consumption
* Early detection of plant stress is very important to ensure better growth and yields of all crops
* Demand for research in the field of stress detection in plants of different species. Current research is lacking and applies only to specific species.
* (Results of this project can be applied to water stress detection in other types of crops)

DATA ACQUISITION

* Top view photos of Potato (or similar crop or urban farm) Fields that are labeled as “unhealthy” (wilting) or “healthy” (not wilting). These will be acquired through an online database or contacting a research group (or company?) that has access to such photos.

METHOD

* Determine plant wilting intensity
  + Using some of the initial processing and color based metrics in Yang, Baireddy, and Cai’s Image-Based Plant Wilting Estimation paper
  + Using clustering to identify individual plants and track density of clusters over time (More dense = wilting less, less dense = wilting more)

DATA ANALYSIS

* Relationship between wilting and future substantial water stress damage
* **Find the point where the amount of early onset wilting indicates future water stress damage to the plant.**

TIMELINE

10/18-10/25

* Begin Acquiring Top View Images of Fields that are labeled
* Begin developing algorithm to track density of clusters
* Begin recreating initial processing and color based metrics in paper

10/25-11/01

* Finish Acquiring Top View Images of Fields that are labeled
* Finish recreating initial processing and color based metrics in paper
* Continue developing algorithm to track density of clusters

11/01-11/08

* Finish developing algorithm to track density of clusters
* Tweek water stress detection methods

11/08-11/15

* Data analysis
* Begin writing thesis
* Send Professor Ahuja very rough draft of thesis

11/15-11/18

* (continue leftover research work if needed)
* Finish rough draft of thesis

11/18-11/29

* (continue leftover research work if needed)
* Finish rough version of oral presentation

11/29-12/06

* Finish final version of oral presentation

12/06-12/12

* Finish final draft of thesis