

# CMPSC 293S Winter 2019

## Project Definition

**Group Name:** The Shambles

**Group Members:**

Last Name	First Name	Email	Student ID
Saquib	Nazmus	nazmus@ucsb.edu	7275274
Paul	Udit	u_paul@ucsb.edu	6610687
Ermakov	Alex	aermakov@ucsb.edu	8075517
Ramamoorthy	Santha Meena	santhameena@ucsb.edu	6404842

**Project Description:** Proper irrigation is an important factor for growth and development of plants and crop. The intensity of irrigation depends on the amount of water lost from the land. If too little water is used for irrigation compared to the amount lost, plants/crops will not get enough water. On the other hand, if too much water is used it would have a detrimental effect on the plants/crops. Water can be lost in primarily two forms – evaporation from the surface of the soil and transpiration from aerial parts of plant. Together this is known as *evapotranspiration* (ET). ET depends on a number of parameters such as temperature, soil moisture, solar irradiation, etc. In this project we will try to estimate ET values by studying the SmartFarm data along with data from California Irrigation Management Information System (CIMIS – has weather stations in different places). The primary objectives of our project are delineated below. More objectives might be added as the project progresses and/or the already stated objectives might be refined.

1. *Estimation of ET values from CIMIS data.* CIMIS contains data for some of the parameters required to calculate ET along with their own value of ET. It could be observed how close we can get to the ET value published in CIMIS using their parameter values.
2. *Estimation of ET values by combining reading from multiple weather stations.* It might happen that we are in a place where there is no weather station. Then one option would be to estimate the ET value from nearby  $N$  weather stations.
3. *Estimation of ET values by augmenting local data.* This objective is an extended part of the previous one. Assuming we do not have a local weather station, but have sensors for measuring temperature and soil moisture; we would like to predict ET value of our current location using ET values from nearby weather stations and local temperature and soil moisture data. If this appears to have better estimation, we could use SmartFarm data (which has temperature and soil moisture data) along with ET values from nearby weather stations.