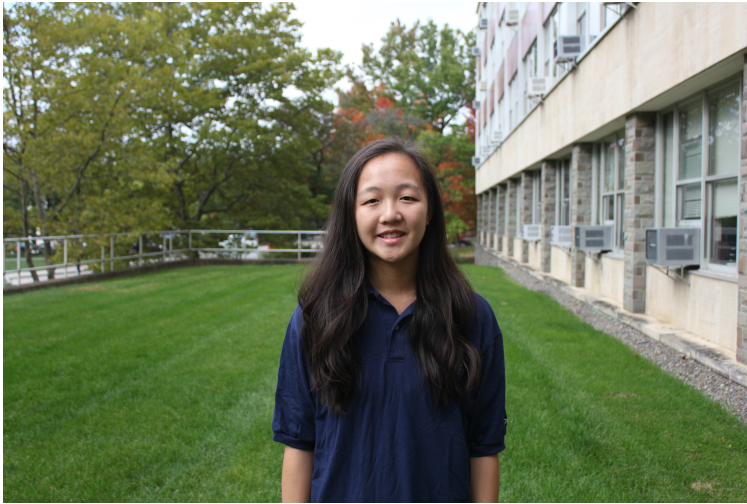


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## Cheer Tsang's Individual Contribution Page



### Spring 2017 Contributions

In Spring 2017, I am continuing my work on the Sensor Development subteam. First, we modified the solids concentration photosensor that we designed last semester for the Anaerobic Fluidized Bed (AFB) subteam and redeveloped the photosensor for the High Rate Sedimentation (HRS) subteam. The photosensor was calibrated to measure the concentration of clay flocs within the HRS recirculators. My team and I created the calibration curve by testing the photosensor with various concentrations of clay. Then, we were able to use the calibration curve to convert voltage readings to concentration.

Next, we designed a submersible concentration sensor, which will be used to measure the height of the sludge blanket in the sedimentation tank. The design of the submersible sensor consists of a photometer attached to the end of a 2m marked pipe. As the sensor is lowered into the sedimentation tank, the photometer will measure the voltage. When the photometer reads the dark voltage, due to the high concentration of the sludge blanket, the height of the sludge blanket can be read from the markings on the pipe. We completed fabrication of the submersible sensor this semester, and the next steps for the Sensor Development subteam are to test the sensor and optimize it for portability.

### Fall 2016 Contributions

In Fall 2016, I became a new member of the AguaClara Sensor Development team. We worked with the program ProCoDa to optimize a pressure-vent. Our goal was to quantitatively measure the amount of biogas produced by anaerobic reactors in order to assess the efficiency of anaerobic reactors. We will measure gas volume by using air pumps to displace water, and using water displacement measurements to calculate the amount of gas. We completed fabrication of four biogas sensors for the Anaerobic Fluidized Bed (AFB) subteam. We also worked on building a photosensor to measure the solids concentration within the AFB reactors. Using an LED and shining it through the AFC reactor pipes, we calculated a calibration curve by determining the relationship between the solids concentration and the intensity of light. We will need to modify this calibration curve in the future.