The base objectives we had to complete were to navigate to within 250 millimeters of the pool, measure the pH of said pool within 0.3 units of the actual value, and transmit the measured pH. The advanced objectives were to collect a 10-15 mL sample of the polluted water and neutralize the pool to a pH within the range of six to eight. The pool is to be filled with 650 to 800 milliliters of polluted water with a pH between two and five. The acid in the water would be acetic acid. To navigate to the location of the pool, a control algorithm was created to go to the pool and complete the objectives in order. Once over the pool, the OSV lowers a platform into the pool. On this platform are a pump, a pH meter, and tubes from the two syringes being used for the advanced objectives. Once in the pool, the pH meter measures the pH and transmits it through the APC220. To collect the sample, a syringe is mounted on the OSV. This syringe is pulled by a system of rubber bands. To keep this syringe in place until it is needed for the mission, a solenoid is used. Having calculated and tested the best and worst case scenarios given in the mission specifications, it was determined that 24 grams of sodium bicarbonate would get the solution to within the range of both cases. Since the reaction of sodium bicarbonate and acetic acid produces carbon dioxide at one mole for every mole of acid or base. As a result, the sodium bicarbonate must be added slowly, so it does not cause the solution to overflow. To solve this problem, it was determined that a syringe would be used to dispense the base. This syringe is filled with the 24 grams of sodium bicarbonate along with 50 milliliters of water. The base is dispensed into the acid solution when the seal on the syringe is broken. To break this seal, we have the stopper pulled out of the syringe by a motor. The stopper and motor are connected by a bundle of string that pulls the stopper out when the motor shaft turns. Once the stopper is out, gravity does the rest of the job with a little help from the pump that agitates the solution to force more interaction.