# **Capstone – Proof of Concept Contract**

***Group 15***

*Victor Velechovsky*

*Gabriel Potter*

*Amandeep Panesar*

*Taha Mian*

*Nishanth Balamohan*

**Project Outline**

HydroSwarm is a swarm of autonomous robotic boats meant to carry out measurements over large bodies of water. For our project, these boats will be measuring water temperature, but the idea can be expanded to any number of other quantifiable measurements. Central to our work will be two major components. First, a small motorized boat, attached with a water temperature sensor, as well as a control unit that allows it to communicate with – and be controlled by – a centralized control unit. Second, a software package that can control a large group (swarm) of these boats, with an algorithm focused on producing reliable, accurate, and fast measurements.

**Presentation**

For our final presentation, we plan to demonstrate the following:

1. Use three autonomous boats to map the temperature of a swimming pool-sized body of water
2. Visualize the temperature data with a heat map
3. Show, through simulation, that our project can be expanded with an arbitrary number of boats (‘insects’) in order to efficiently cover large bodies of water with arbitrary shapes

**Conclusion**

Our demo will prove that we have surmounted the basic technical challenges involved with building autonomous boats, as well as the software challenges of controlling and communicating with them in a collective manner.

A swimming-pool sized demo, in conjunction with the simulation, would indicate that our project could be scaled successfully, since there ought to be no inherent difficulties with running this project on a bigger body of water (other than financial or practical constraints).