## Underwater Unmanned Vehicle

### Overview
Boeing gave us the opportunity to compete against the Electrical Engineering Dept. The competition was held at the Engineering Showcase. We competed by building Underwater Unmanned Vehicles. Basically we had to build remote controlled submarines from the ground up.

### Objectives
To design a Underwater Unmanned Vehicle that meets the following Specs:

- Has an internal Ballast System(takes on water to submerge)
- Is fully autonomous in the Z direction, such as submerging and rising.
- Controlled wirelessly in the X direction, forward/backward motion
- Must use LiPo batteries and an Arduino Mega microprocessor

### Approach
For our approach we used 5” PVC pipe as a Hull. We used a WiFi shield for the arduino to achieve the wireless goal. For propulsion we used a water pump. We also put a servo on the back that would redirect the underneath to provide us reverse motion. Our internal Ballast system consisted of two plastic bags connected to two mini centrifuge water pumps. When we would want to rise we would crush the bags using plastic plates connected to linear actuators. The idea is to have the sub be positively buoyant and as it takes on water it will become negatively buoyant.

### Outcomes
Overall the project was a success. Although we had some mishaps along the way we still had a functioning prototype in the end. Obtaining parts and figuring out how to make them work together was the biggest challenge. The other biggest problem was putting in enough weight to make it sink. We also had some loose connectors inside that affected our ballast tank pumps, which meant that it wouldn’t submerge. If we had better connectors it surely would have submerged.