NC State University
Underwater Robotics

Autumn 2012
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PRESIDENT’S CORNER

The Underwater Robotics club is off to a considerable start this academic year. The first part of the fall semester was taken up with cleaning and reorganizing the lab, planning for the year, and also recruiting new team members. The team has done a fantastic job recruiting new members this year. We now have about 30 team members. Our team has shifted a little into more of a focus on software and mechanical projects. Although our electronics group is the smallest out of our engineering subteams, our electronics systems are strong and dedicated to their work.

We are building an entirely new robot this year, currently called Seawolf VI. This will be a major change from using a Pelican case with aluminum extrusion chassis to building a completely machined chassis with a waterproof hull.
Another major goal of the new robot is the acoustics challenge. One of the objectives in our annual Robosub competition is the challenge of finding an underwater pinger and picking up a structure above. Matt Wiggins and I are currently working on the acoustics project. We received an undergraduate research grant for the project. The current plan is to use an array of hydrophones (underwater microphones) and determine phase differences between them to triangulate the pinger. Once we have this working, we plan on testing many layouts as well as trying things like using the doplar effect to determine direction to the pinger.

—David Vanleeuwen

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For the past three years Seawolf has gotten further and further in the competition course. Our software team has worked hard to write the code to make this happen. With another year of experience on our hands, we’re looking forward to yet more improvement over the next year.

At the beginning of the school year, it looked like we were going to have a very small software team, due to members that have graduated. Thankfully, our recruitment efforts were successful and we now have many strong new members working on software.

Our biggest goal for next competition is to complete the torpedo and acoustics missions. This will require a lot of work, from vision processing to mission control, plus endless hours of testing on top of that. But that work will be well worth it. If we can reliably finish those missions, we will have one of the top robots in San Diego next year.

The software team is also working on preparations for Seawolf VI. We are rewriting our PID control algorithms in Python. Since the new robot will be able to control it’s roll, we also need to write a roll PID.

The software team has a lot of work to do, so keep up with our blog for updates on our progress!
Community outreach has become a primary goal of our club, we have been involved with a number of organizations to help promote engineering and sciences.

Most recently the team spoke to fourth graders at Weatherstone Elementary and volunteered at a robotics event for middle school students.

Weatherstone Elementary invited the URC to be the focus of a monthly event to promote Science, Technology, Engineering, and Mathematics. Three classes of fourth graders attended the event, where team members spoke about our work, demonstrated Seawolf V, and answered questions. The students showed a lot of interest, spending most of the hour asking questions ranging from the robot to how
we personally began working with robotics. Afterwards, parents and teachers expressed how great it was to see the kids so excited about our work. We have already been invited to Weatherstone’s upcoming STEM fair, and asked to speak again in the future.

The team also volunteered at a Lego League robotics competition held at MiddleCreek Community Center. The goal of this program and event is to promote the field of robotics to middle and elementary school students. Students are given a set of tasks to build their own robot using Lego Mindstorms. Our team members helped assemble the competition’s field and pits, and served as judges, giving students awards based on the technical work and how they worked together as a team.

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