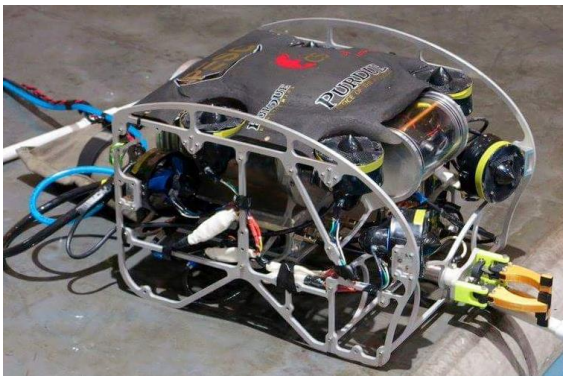
Purdue IEEE ROV: End of Year Newsletter

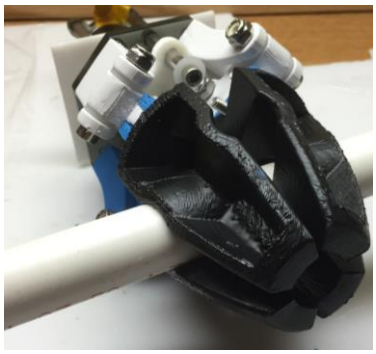
Happy New Year to all ROV supporters, potential future members, and alumni! The Purdue IEEE ROV team had a busy first semester in what is shaping up to be our best year yet! We will begin to routinely send these emails to keep everyone up-to-date with the current progress of the team.

Last year our 42-member team placed 13th out of the 31 qualifying teams in the EXPLORER Class at the international competition in Houston, Texas. In order to help other teams with ideas and inspirations, our 2015-2016 season designs of ROV *Maelstrom* have been open sourced at github.com/purduerov/ROV-Maelstrom. While we were pleased with our designs and our improved placement from the previous year, our team began this year eager for a top-place result.



ROV Maelstrom

We had an incredible recruiting season this year. The team received 68 applicants in addition to many returning experienced veterans. The size of interested members resulted in a selective application review process, and therefore the most skilled new member influx to date. The selected members underwent initial training in EAGLE, SolidWorks, and more depending on their chosen technical team.



Current Manipulator Prototype

Due to larger membership, and need for stronger multidisciplinary communication, we have introduced project groups. Each of the six project groups contains members from the Electrical, Mechanical, and Software teams. Therefore, each group -- Structures & Connectors, Basestation, Logic Boards, Camera & Sensors, Power and Movement, and Tools and Actuation -- focuses on specific parts of the vehicle. The new team structure is being continuously improved since its launch. And since we are seeing accelerated ROV development, the project group system will likely return in future seasons.

Near the end of the semester, MATE released the mission tasks and competition rules. The theme is *Port Cities of the Future: Commerce, Entertainment, Health, and Safety*, and the competition will be in Long Beach, California. The task is to create an ROV that can complete a series of product demonstrations, such as hyperloop construction, light and water show maintenance, environment cleanup, and risk mitigation in a simulated harbor. Challenges such as reading Bluetooth underwater have been introduced along with more familiar MATE tasks like distance measurement, sample collection, and object identification.

Machining of an endcap

This year the team has decided to move to a Raspberry Pi architecture with some functionality offloaded to a microcontroller. This allows us to put

Linux on the ROV and gives the Software Team members additional capabilities to implement more advanced features. Members of the Mechanical Team have designed the frame to be the smallest and lightest to date, while maintaining all needed tools. The main manipulator has been tested and only needs a few refinements to perfect it. Members of the Electrical Team have largely finished designing all boards, and they will begin populating and testing them in the first month of the Spring semester. The power management system has increased flexibility since load sharing has been incorporated, and a modified backplane will again be utilized to tie all the boards together. The team is continuing research and development of sonar positioning system, and tests are well underway.

ROV Members Suited up for Paintball!

Though the team has made great technical progress, we made time for social and outreach events. We volunteered at the PESC Dare to Design towards the middle of the semester where we helped teach children basics about circuits and their application to robotics. Socially we had a great time paintballing with ASME and fellow IEEE members. We even did an ROV vs. all match and had a great time. We almost won; we were only down a couple of points!

Next semester, we look forward to lots of manufacturing and testing. We will be accepting 5-10 new members who can quickly dive into the task at hand. Those interested should apply at purdueieee.org/rov/join.

Finally, we would like to say thanks and good luck to Matt Molo, longtime ROV member and Software Team Lead who graduated this December. He will be succeeded by Ben Maxfield. Additional administrative changes include Alex Ruffino to replace Joshua Berg as Mechanical Team Lead (due to internship) and Sanay Shah to resume his previous position of Vice Captain to replace Alex Ruffino. Despite the loss of key leadership and some project group heads, the ROV season is bright. We are ready to meet all challenges and come out triumphant!

Happy New Year and Boiler Up!
Purdue IEEE ROV
purdueieee.org/rov

The Fall 2016 ROV Team