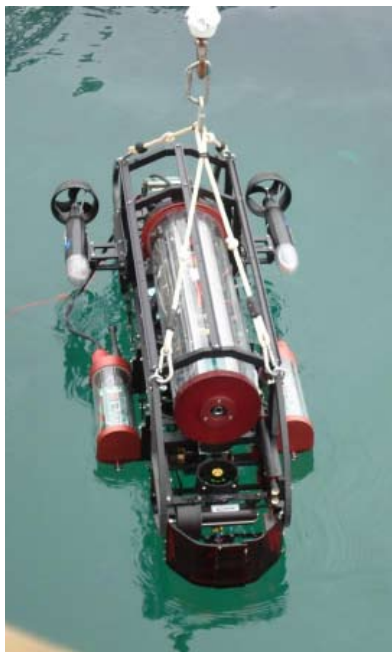


CU AUV

2009-2010 Sponsorship Packet



About the Team

The Cornell University Autonomous Underwater Vehicle team (CUAUV) consists of undergraduate and graduate students who are exploring the cutting edge of unmanned underwater technology.

Each year, CUAUV competes in the international autonomous underwater competition organized by the Association for Unmanned Vehicle Systems International (AUVSI) and held at the Space and Naval Warfare Command Research facility in San Diego, CA.

In the 2009 competition, CUAUV placed 1st out of 30 teams. The team also placed 1st in technical design. The team hopes to continue with its success next year. The 2010 vehicle design will be based off of the 2009 vehicle, improving on its design flaws based on lessons learned.

The team depends on the generous support of its sponsors and could not exist without them. To become a member of the CUAUV sponsor group, we accept monetary and in kind donations to help support our endeavours in creating and improving autonomous underwater technology.



Facts About the Team

The development of the autonomous underwater vehicle (AUV) is a yearlong process. The team first spends time designing and building the vehicle. This is followed by testing, integration, and competition preparation.

- This year marks CUAUV's 11th Anniversary.
- The team's 35 student members come from three of Cornell's Colleges and from ten different majors.
- 3 Cornell University faculty advisors are involved in the project. They are Professors Graeme Bailey, Bruce Land, and Alan Zehnder.
- CUAUV has placed in the top 10 every year since it was founded.
- Over 20,000 man-hours per year are spent working on the vehicle.

Technical Overview

The competition requires the vehicle to:

- Maneuver underwater without human input.
- Locate objects visually using its cameras.
- Determine the direction of an acoustic pinger using a custom passive sonar.
- Perform tasks such as dropping markers into bins and firing torpedoes.

Nova, the 2009 competition vehicle, at a glance:

- The vehicle's dry weight is 90 lb.
- Overall length is 50".
- Most electronics are located in a single upper hull.
- 2 horizontal, 2 vertical, and 2 strafing thrusters propel the vehicle.
- The bus voltage is 22.2 volts.

Mechanical Overview

- Single clear acrylic upper hull contains the electronics.
- 6 thrusters with custom motor controllers.
- Twin fully sealed battery pods.
- Built-in stand for easy transport.
- Charging station allows for charging to occur without opening the battery pods.



Electrical Overview



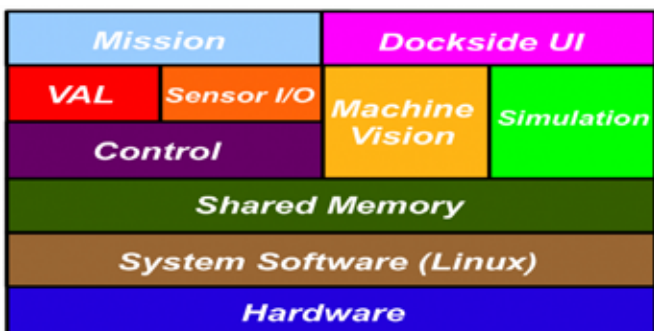
- 2 hour standard runtime.
- Lithium polymer batteries.
- Single board computer with 2.0 GHz Core Duo processor and 2 GB of RAM.
- Hot swappable transition between battery and bench power.
- Distribution boards provide regulated 5, 12, and 24 V power to devices in the vehicle.

Sensors Overview

- 1 USB camera and 1 Firewire camera.
- Doppler velocity log.
- Custom passive acoustic array.
- Depth sensor.
- 3 axis orientation and inertial sensor.



Software Overview



- Shared memory architecture.
- Vehicle abstraction layer.
- Multithreaded OpenCV vision system.
- Custom PID vehicle dynamics controller.
- Curses-based interface for manual control.

2010 Vehicle Overview

Design of the 2010 Vehicle, currently code-named “Akula,” has already begun. To challenge engineers on the team, CUAUV will begin to implement changes to the vehicle architecture that will allow for research-based missions. Goals for the coming year include the following:

- Achieving deeper depths
- Having more sensors
- Building custom thrusters
- Optimizing wire-routing system
- Improving vehicle maneuverability
- Running larger missions
- Simulating Transdec conditions



Your support will go towards a variety of team projects, including:

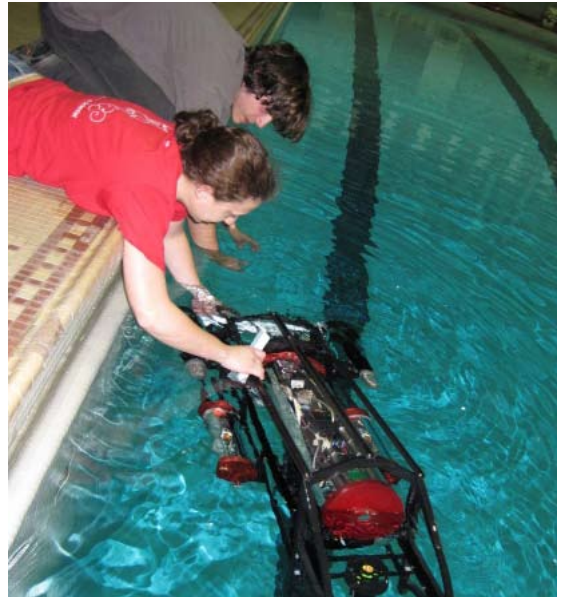
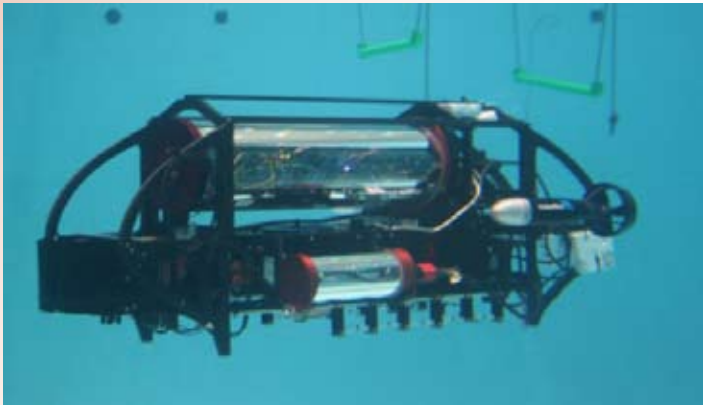


- Custom hydrophone potting
- Custom thruster development
- New and improved compasses
- Camera with user adjustable features
- Custom underwater connector
- Improved actuator design

Testing Overview

Pool Tests

During the year, CUAUV performs regular pool tests at Cornell University's Teagle Hall. Testing allows the team to determine the vehicle's status and capabilities. It also serves as a time for the software team to simulate competition missions.



Lake Tests

In order to better simulate TRANSDEC conditions and serve as a start for future research, the team runs tests in Cayuga Lake. Competition elements, as well as general vehicle functionality, have already been tested with Triton.



Sponsorship

Our achievements would not be possible without the generous support of individuals and industry partners like yourselves.

Some ways to sponsor the team are:

- Monetary Donations
- Hardware Donations
- Software Donations
- Airline Mileage Donations



Sponsorship Levels

Diamond (Highest Donor)

All benefits of the appropriate sponsorship level, plus the the option of including its name in the competition vehicle's name. (e.g. The Cornell-COMPANY Nova)

Gold (Greater than \$5,000)

- * Special distinction in all media coverage
- * Company logo on competition vehicle
- * Company name, logo and description on the website
- * Company name on '10 competition uniform
- * Company name on '10 competition paper and poster

Silver (\$2,500-5,000)

- * Company logo on competition vehicle
- * Company name, logo, and information on website
- * Company name on '10 competition uniform
- * Company name on '10 competition paper and poster

Bronze (\$1,000-2,500)

- * Company logo on vehicle charging stations
- * Company name, logo, and information on website
- * Company name on '10 competition uniform
- * Company name on '10 competition paper and poster

Sponsor (Up to \$1,000)

- * Company name, logo, and information on website
- * Company name on '10 competition uniform
- * Company name on '10 competition paper and poster

CU AUV



Visit us on the web at www.cuauv.org