

Unmanned Systems

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2005 AUVSI Student Competitions



On a run.

For over a decade, AUVSI has run student competitions designed to introduce future generations of engineers and scientists to unmanned systems. Today, four competitions challenge students to design, build and operate air, ground, and underwater unmanned vehicles.

Florida Gators Swim to First Place at Submarine Races

The University of Florida Gators took the first place prize money and bragging rights at the 8th Annual International Autonomous Underwater Vehicle Competition, August 4-7, at the U.S. Navy's Space and Naval Warfare (SPAWAR) Systems Center in San Diego, CA. The win marked the first time Florida earned the top spot after seven previous attempts in the competition co-sponsored by AUVSI and the Office of Naval Research (ONR).



Getting ready.

The University of Florida was followed closely in the competition by Ecole de Technologie Supérieure (ETS) of Montreal in second place, the Massachusetts Institute of Technology (MIT) in third place and Duke University in fourth place.



All the students were winners.

This successful competition consisted of teams of international students from 19 high schools, colleges and universities competing for \$20,000 in scholarship money and "bragging rights". Using

unmanned underwater vehicles, the students strived to fulfill the competition's three missions:

- **Mission #1** – Rendezvous with a "docking station."
- **Mission #2** – Find and mark a break in an underwater pipeline.
- **Mission #3** – Home in on an acoustic beacon and breach within a marked surface zone.

Each of the top four teams, which excelled in qualifying heats on Saturday and Sunday and advanced to the Finals on Sunday afternoon, completed only one of the three IAUUV Competition missions. For their efforts, the University of Florida was awarded \$5,500, Canada's ETS \$4,500, MIT \$4,000 and Duke University \$2,000.

In addition to AUVSI and ONR, the competition was supported by the Naval Undersea Warfare Division — Newport, SPAWAR Systems Center San Diego, Northrop Grumman, IXSEA, the Lindbergh Chapter of AUVSI and TAMSCO.

13 Colleges and Universities in AUVSI/Navy UAV Contest

AUVSI and the U.S. Navy's Program Executive Office for Strike Weapons and Unmanned Aviation, on July 2 hosted the 3rd Annual Student UAV Competition at Webster Field, St. Inigoes, MD.

The event has steadily grown over the years, this time attracting 13 colleges and universities from around the world. They were:

California State Polytechnic University

Cornell University

Istanbul Technical University

Massachusetts Institute of Technology

Mississippi State University

North Carolina State University

Parks College, St. Louis University

Polytechnic University of NY

University of Kentucky

*University of Manitoba,
Canada*

*University of Texas at
Arlington*

*Virginia Commonwealth
University*

*Virginia Polytechnic
Institute & State
University*



At the controls.

According to Joe Brannan, competition director, “the purpose of the competition is to challenge a new generation of engineers to design and build autonomous unmanned air vehicles capable of performing realistic missions in a simulated environment, and to foster ties between young engineers and the organizations developing UAV technologies.”



Wheels up!

Participating teams received an orientation brief upon arrival and were treated to a tour of the Patuxent River NAS. The students provided oral presentations to a panel of judges who also scrutinized technical papers submitted two weeks before the competition.

The actual flight competition took place on July 2 followed by an awards banquet. Mark Pilling, competition technical director, said “each year, the level of competition gets stronger and more intense, and I am very impressed with the effort that these students put into their projects.”

In the actual flight competition, the UAVs were required to fly autonomously, navigate a specified course, use onboard payload sensors to locate and assess a series of man-made targets prior to returning to the launch point. Each team was required to complete the task within 40 minutes.

Industry sponsors and the Navy have been strong supporters of this event, which allows both industry and government officials to talk to the next generation of unmanned systems designers and developers. It also allows the students, most of whom either graduated or are

entering their senior year, to talk with industry and government personnel about career options in the unmanned systems industry.

Prizes were awarded for various efforts to include the technical paper, oral brief, mission performance, and safety. The overall winners were:

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|------------|----------------------------------|
| 1st | University of Texas at Arlington |
| 2nd | Virginia Commonwealth |
| 3rd | North Carolina State |
| 4th | Virginia Polytechnic |
| 5th | University of Manitoba |
| 6th | University of Kentucky |

AUVSI awarded a total of \$18,750 in prize money, with \$6,500 going to The University of Texas at Arlington, the first place finisher.

Five New Student Teams Seek \$50,000 Purse

The AUVSI International Aerial Robotics Competition (IARC) was held on July 21st at the U.S. Army Soldier Battle Lab's McKenna Urban Operations Site, Fort Benning, GA.



Virginia Tech Autonomous Helicopter returns home after completing a 3 km flight for Level 1.

This was the 15th year for the IARC. Thirteen of the twenty officially-registered university teams from the United States and Canada attended this year's event. Several teams moved forward in the rankings with five teams working for completion of Level 2 behaviors in 2006 and one team attempting Level 3. Currently Virginia Tech, Simon Fraser, the University of Arizona, and the University of Waterloo have demonstrated Level 1 behaviors and area now working toward Level 2, with Georgia Tech having already completed Level 2.

This year a technical seminar series was inaugurated with four sessions:

“UAV Simulation,” Ben Thompson (Dynamics)

“The Basics of Helicopter Flight Control,” Aaron Kahn (NRL)

“Biologically-Inspired Micro Air Vehicle Design,” Robert Michelson (Millennial Vision)

“Flight Testing Prototype UAVs: Crash Early, Crash Often,” Don Lacey (Raytheon)