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MIT team takes first place in international AUV competition

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An MIT student team's small, self-guiding submarine came in first in the inaugural International Autonomous Underwater Vehicle Competition held August 1-3 in Panama City, FL.

The team walked away with \$5,000 in prize money and a chance to have its design spawn future vehicles to explore the oceans and check for underwater hazards without risking human lives.

The event was sponsored by the Office of Naval Research (ONR) and the Association for Unmanned Vehicle Systems International (AUVSI). In addition to the cash prize, members of the winning team will be invited to observe on board an AUV research cruise in September in the Gulf of Mexico involving several university groups and the US Naval Oceanographic Office.

The competition's goal was to advance the technology of autonomous underwater vehicles by challenging the next generation of engineers to perform a real-world mission.

Ara Knaian, a senior in electrical engineering, and Seth Newburg, a junior in mechanical engineering, led the MIT team of about 20 people. The other teams came in the following order: Stevens Institute of Technology, the University of Florida and Johns Hopkins University.

"In designing this vehicle, we were inspired by the post-cold-war spirit of efficient, cost-effective engineering exemplified by the Mars Pathfinder," wrote the team in a paper submitted to judges.

"Our vehicle, the ORCA-1, is designed to reliably, repeatedly and efficiently complete the course at a brisk speed under a wide variety of interfering conditions, component failures and irregularities in the course layout. Every component of our vehicle that we did not make ourselves can be mail-ordered and delivered within a day, which allowed a short design cycle and a relatively low budget."

ORCA-1's main hull was made of PVC pipe sealed with commercial expanding test plugs. It contained batteries, electronics and a variety of sensors. There were two main thrusters on either side for turning, and two thrusters to keep it submerged. It had a forward-looking and bottom-looking array of sonar transducers, and was controlled by a 586-based single board computer running the Linux operating system.

The AUVs had to perform all tasks autonomously, with no control, guidance, or communication from a person or from any off-board computer. Each vehicle was limited to 100 kg, or 220 pounds. Points were awarded for design, functionality, presentation and teamwork.

In addition to Mr. Knaian and Mr. Newburg, students on the MIT team included graduate students Holly Gates, Leila M. Hasan, Andrew S. Huang, Frank Lee and Matthew Reynolds, seniors Ahmed Ait-Ghezala, Edward S. Boyden, Sawyer Fuller and Ben Polito; and sophomores Corrina Chase, Francisco J. Delatorre, Jonah Elgart, Matthew D. Hancher, Eric D. Smith and Emily C. Warmann.

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