

UF's 'SubjuGator' begins competing today in robo-sub contest

July 14 2010, by Aaron Hoover



Two University of Florida engineering students work with UF's robotic submarine, SubjuGator, in a pool as part of preparations for this week's International Autonomous Underwater Vehicle Competition in San Diego. The UF team is among 22 teams from around the world who will pit their fully robotic submarines against one another in the competition at the U.S. Navy's Space and Naval Warfare Systems Center.

As technicians maneuver remotely operated vehicles to try to stem the Gulf gusher, the next generation — submarines that perform missions on their own with no human control — will be in the spotlight in California.

A team of engineering students from the University of Florida is among 22 teams that begin competing today in the 13th annual [International Autonomous Underwater Vehicle](#) Competition in San Diego. At least

three are expected to emerge from trials this week to pit their robotic submarines against each other in finals set for Sunday.

The UF team is the only one to have participated in the competition since its inception. The team's "SubjuGator" was the victor in 2005, 2006 and 2007. Eric Schwartz, associate director of UF's Machine Intelligence Laboratory and longtime director of the SubjuGator project, said the team is hopeful it can recapture the mantle this year.

"Our submarine this year is perhaps the most contemplated design we have ever had," Schwartz said. "We completely redesigned the software and the control systems, and in the process we redesigned quite a bit of the electronics."

SubjuGator has two high-performance computers, six thrusters and numerous sensors that help it to determine its position, navigate toward or around obstacles and identify targets of interest. Over the years, UF teams have built, rebuilt and modified the cooler-sized submarine from scratch, including all the electronics except the computers. This year's version of SubjuGator would cost about \$100,000 to replace, Schwartz said.

Competitors face many challenges in events this week set in a football-shaped pond about the size of a football field at the U.S. Navy's Space and Naval Warfare Systems Center.

Without human input or control, the submarines must find colored buoys in a designated order. The subs have to mark the location of submerged simulated weapons. They also have to locate and visit the source of a sound in the pool, as well as simulate a rescue, dropping a mannequin in a target zone.

Schwartz noted that the small, shallow-water submarines are different

from the larger, human-controlled ROVs at the center of attempts to stop the flow of oil from the Deepwater Horizon well. But he said robotic submarines, or elements of their technology, could play an increasingly important role in oil spill recovery efforts. For example, he said, sensors and computers used on the robotic [submarine](#) might well have prevented the ROV crash that forced BP to temporarily remove its well cap containment system in June.

Robotic submarines could also monitor waters for oil contamination, he said. Other potential applications include patrolling border waters or inspecting the hulls of ships for bombs or nearby mines.

The UF team consists of a core group of nine undergraduate and graduate students majoring in mechanical engineering and electrical and computer engineering, Schwartz said. Harris Corp. is a longtime chief sponsor of the team along with Lockheed Martin over the last several years.

Provided by University of Florida

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