



LAWRENCE TECH'S student-designed fuel cell-powered H2Bot took third place internationally at the 2006 Intelligent Ground Vehicle Competition at Selfridge Air National Guard Base.

Students Design Robot Powered with Fuel Cells

By Nicole Beattie
Staff Reporter

Students from Lawrence Technological University have combined the power of hydrogen fuel cells with advanced unmanned vehicle technology to create a vehicle that could prove to be extremely useful for the United States military in the near future.

With Congress mandating that a third of all future Army vehicles be autonomous by 2015, Lawrence Tech engineering students set off on a year-long senior project to develop a clean, unmanned vehicle named H2Bot.

"The H2Bot design can be applied to real world situations in the Army and also technologies in civilian cars," said CJ Chung, Lawrence Tech professor of computer science and H2Bot project advisor.

In June, the robot vehicle took third place internationally, among 41 competitors at the Intelligent Ground Vehicle Competition, hosted by Oakland University and held at Selfridge Air National Guard Base in Harrison Township.

"The military currently has fuel cell vehicles and they are continuing to research these kinds of vehicles," said Jacob Bushon, 24, an H2Bot student team member who received a bachelors degree this year in electrical engineering. "Fuel cells are something that will be integrated in the near future ... the military wants clean auxiliary power."

Bushon was responsible for integrating the fuel cell into the car system. He said the H2Bot was the only unmanned vehicle to ever be powered using fuel cell technology in the competition's history.

The students were able to buy the \$6,500 fuel cell from Helio Centris through Lawrence Tech's Kern Student Grant Foundation, Bushon said.

"The challenge was regulating the power output and supplying that power to all the components in the robot," Bushon said of the fuel cell, which may prove to be a viable source of energy that could play a critical role in the United States reducing its heavy re-

liance on fossil fuels.

Chung said the group was pleased with how the robot vehicle performed using the fuel cell technology.

"The main reason why we chose the fuel cell was because it lasted longer, we could run the robot for 6 hours," Chung explained. "Also, we could test our robot indoors. The choice of the fuel cell is great because it's clean and it produces only water."

The competition also challenged the students to create a robot vehicle that could navigate through an obstacle course, which the Lawrence Tech Team demonstrated recently at the school's Southfield campus. The H2Bot is equipped with a Differential-Global Positioning System (D-GPS), a digital compass, an on-board camera and a laser scanner to navigate the course.

"The robot has to see the orange construction barrel, avoid it and go around it," Bushon explained.

Chung said the H2Bot performed perfectly. "Every time the robot was visiting the correct points. It's important to remember that this is not a remote-controlled robot, but controlled through GPS automatic system and is programmed to react to the data it receives from its sensors," he said, adding that the competition is a challenge, but can be extremely beneficial for engineering students.

"The competition was organized by the U.S. military to recruit good students from the teams," he said.

Bushon agrees. "I was able to apply all I've learned in college to the integration of the fuel cell into the vehicle."