Autonomous Robots Navigate Obstacles During Competition

By Scott Roush
Staff Writer

Fourteen university teams pitted their unmanned vehicles against each other and an obstacle course in the Third annual International Ground Robotics Competition last week at Oakland University.

The University of Colorado at Boulder team took home first place and $5,000 with their modified plastic Mattel Power Wheels Jeeps that carried computer processors, motors and video cameras used to navigate the vehicle around the course.

Other vehicles used modified golf carts and other similar carts as the basis of their robots. Oakland University finished sixth using a motorized wheel chair after a second-place finish last year.

Prizes totaling $11,000 went to the top three vehicles in the competition sponsored by the Association for Unmanned Vehicles Systems (AUVS) and co-sponsored by Oakland University and the Society of Automotive Engineers.

"This is good weather for the competition," said Oakland University professor Ka. C. Cheok, one of the organizers of the event as he surveyed the competitors on the warm, sunny morning. "I think some of them will be able to complete the course."

Unfortunately none of the teams were able to navigate the entire course, as the Boulder robot finished at 459 feet. OU's Coyote vehicle stopped at 102 feet when its sonar sensors broke down.

Organizers and hosts were OU and the U.S. Army Tank-Automotive Research Development and Engineering Command (US Army TARDEC) in Warren.

Paul Lescoe of TARDEC said the vehicles had to be between three and nine feet in length, capable of carrying at least a 20-pound pay load and powered by combustible fuel.

"It's a more difficult course than last year," Lescoe said. "We're studying the competition for unmanned vehicle technology as well as commercial use to make cars easier to drive. We're grateful for the prizes so we can award these students for their efforts."

The students' performance can impact future robotics ventures ranging from space exploration to manufacturing, according to competition officials, and the entire contest is designed to encourage more student engineers to work in robotic guidance systems for unmanned ground vehicle systems.

In addition, a $1,000 prize sponsored by the Society of Automotive Engineers was given to the University of Cincinnati for best design.

"They did a very good job on the design process," said William Agnew of Cincinnati's efforts, who was one of the judges of the design competition. "They all did a very good job."

Agnew said the technology used at the robotic competition could one day be used in intelligent cruise control systems on cars, where sensors determine how close a vehicle is to the one in front of it and applies the brakes when it gets too close.

"That's principal application we're talking about," he said.

All entries were unmanned and completely autonomous with all sensing and computer equipment on board and with no ability of the sponsoring teams to guide their vehicles.

For safety, the vehicles were limited to 5 mph and there were cut-off switches to stop a robot vehicle if it went out of control.

The guidance systems and computers had to sense the right and left boundary lines of the circular, 100-yard, grassy course, and also navigate the vehicles around obstacles placed at various points along the route.

The route was laid out roughly in the shape of Colorado, whose schools have historically done well in the competition. The robots also had to navigate through a sand pit and an inclined ramp.

Following University of Colorado at Boulder was Ohio State University in second and the University of Colorado at Denver in third.

Colorado School of Mines, last year's winner, finished fourth, followed by the University of Minnesota, OU, Northern Illinois University and the University of Tulsa.

OAKLAND UNIVERSITY students watch the progress of their 'Coyote" autonomous robot during the third annual International Grounnd Robotics Competition at the OU campus.