

PRESS RELEASE

Electrical and computer engineering students enter DARPA Grand Challenge 2005

Under the direction of Professor Howard Michel, 30 University of Massachusetts Dartmouth engineering and computer science students have taken up a challenge, the DARPA challenge, that is.

The Defense Advanced Research Projects Agency (DARPA) is sponsoring a challenge to the high-tech community— to design, develop and race a fully autonomous vehicle more than 140 miles across the rugged Mojave Desert. The prize to the winning team is \$2 million.

Dr. Michel, assistant professor of electrical and computer engineering and the students are designing and building a lightweight, nimble gas-electric hybrid vehicle. A gas-electric hybrid vehicle has a gas-engine-powered generator to charge batteries, while vehicle propulsion is provided by electric motors running off of the batteries. This method of propulsion was chosen to allow for easy control by computer, yet with the energy storage efficiency of gasoline. According to Michel, the number of batteries required to store the equivalent energy as five gallons of gasoline would have made the vehicle too heavy.



Dr. Howard Michel, professor of electrical and computer engineering, is leading a team of UMass Dartmouth students in the creation of a fully autonomous vehicle for the Defense Advanced Research Projects Agency (DARPA) challenge. The winning team will receive \$2 million.

For “eyes” and “ears,” the vehicle will have two radars, one laser range detector, four ultrasonic sensors and seven computers connected through a car-wide local area network. The computing requirements to navigate the route, detect and avoid obstacles and control the vehicle are too demanding to be performed by a single computer, according to Dr. Michel.

“Relatively simple things that we take for granted, such as driving a car, are in reality very difficult and complex tasks when done by a computer,” Dr. Michel said. “We don’t know yet how to process and act on complex and sometimes conflicting sensory information streams. This is the crux of the Grand Challenge.”

According to Dr. Michel, the Grand Challenge gives UMass Dartmouth's capable and talented engineering students the opportunity to compete against nationally known universities and high-tech companies. He said that the UMass team should be a strong competitor despite lacking the financial resources of several of the other teams.

Participation in the DARPA Grand Challenge reflects the team's view that the event serves as a tribute to our nation's heritage of innovation and ingenuity, Dr. Michel said. "It's an exciting way to contribute to our national security and offers UMass Dartmouth an excellent opportunity to put its name on the national stage," he added.

The UMass team is seeking broad financial or in-kind support from interested underwriters who could benefit from the widespread visibility the event will attract. Support will be used to underwrite the costs of building a fully autonomous vehicle, completing the rigorous pre-testing process and competing in the Grand Challenge event on October 8, 2005. "For sponsors, supporting a team offers the opportunity to be part of an ongoing and historic initiative that has proven to be highly visible and of great interest to leaders in the military, the commercial sector and government," Michel said.

Sponsors of the UMass Dartmouth team to date include ArKion Systems in New Bedford, Massachusetts; Micro Computer Associates in East Greenwich, Rhode Island; EMC Corporation in Hopkinton, Massachusetts; the UMass student chapter of the American Society of Mechanical Engineers; and the University of Massachusetts Dartmouth.

The DARPA Grand Challenge is a Congressionally mandated program that authorizes DARPA to conduct contests and award prizes for advancements in vital technologies. In the 2001 Defense Authorization Act, Congress set a goal that one-third of operational ground combat vehicles will be unmanned by 2015.

The first DARPA Grand Challenge was conducted on March 13, 2004, along a route that ran from the environs of Los Angeles to a location outside Las Vegas. Fifteen fully autonomous (not remote-controlled) vehicles attempted to navigate a tough course. None succeeded, but the excitement and momentum generated by the first field test has continued to build in anticipation of DARPA Grand Challenge 2005.

For updates along the road to DARPA Grand Challenge 2005, please visit www.darpa.mil/grandchallenge. For progress of the UMass Dartmouth team, visit <http://www.umassd.edu/engineering/ece/darpa/>.