



NEWS

Mesa State College
Office of Development
1100 North Avenue
Grand Junction, CO 81501-3122
Phone: 970-248-1868
Fax: 970-248-1076
www.mesastate.edu

For Immediate Release: April 25, 2007

**Contact: Dana Nunn 248-1868
640-0421**

Robotic Car at Mesa State College

The robotic vehicle being designed by Team Mojavaton with assistance from Mesa State faculty members will be at Mesa State Thursday, April 26, at 11:30 am near Mav Circle. The vehicle is the Colorado entry in the 2007 DARPA Urban Challenge.

This is a contest sponsored by DARPA (Defense Advanced Research Projects Agency) to develop the technology for autonomous ground vehicles. The winner of this contest will take home a check for \$2,000,000. The prize for second place is \$1,000,000 and third place will receive \$500,000.

In 2001, Congress mandated that by the year 2015, 1/3 of military combat vehicles must have the capability to drive themselves autonomously. That is, they must possess a computer system with GPS and sensors that is capable of driving the vehicle over desert roads and through traffic. The reason for this mandate was very simple – to save soldiers' lives by taking them out of harm's way. The technology to achieve this mandate did not exist, so the Department of Defense charged DARPA with the task of developing this new technology. DARPA created the Grand Challenge contest and offered a cash prize(s) to encourage "outside the box thinking" by universities, corporations, engineers, computer scientists, and entrepreneurs throughout America.

Team Mojavaton entered the 2005 DARPA Grand Challenge contest and finished 13th out of the 195 teams who originally applied for the race. That race was a 132-mile course through the Mojave Desert in Nevada. Stanford University won that race and the \$2,000,000 prize. Team Mojavaton finished in 13th place, ahead of teams from Cornell, Princeton, UCLA, and CalTech.

Team Mojavaton and Mesa State College have entered the 2007 Grand Challenge in which the cars have to drive in traffic. Each robotic vehicle will have to plan its course through city streets, pass other cars, negotiate intersections, merge into traffic, make U-turns, and park. The vehicles will have to drive defensively to avoid an imminent collision with another vehicle and have a "taxicab algorithm" to find its way through an intersection crowded with cars. This is not remote control. Each car is completely on its own and makes all its own decisions about how to drive. Team members and other spectators can only watch as the cars work their way through the course.

Team Mojavaton's vehicle is a Nissan Xterra that has been outfitted with a military grade GPS and inertial navigation unit that can correctly determine its location on the earth to within 4".

The Xterra also contains a variety of sensors including laser range finders, radar, and stereo vision cameras that are capable of sensing the presence and location of obstacles, most importantly other cars. The Xterra's computer system will re-plan its path when an obstacle is detected to avoid the obstacle.

The 2007 DARPA Urban Challenge will occur on Saturday, November 3rd and will be a 60-mile course through traffic at an as yet undisclosed location "somewhere in the western U.S."

Jim Crittenden, the team leader of Team Mojavaton, stated "We are honored to have Mesa State College as a partner in this great adventure. Their expertise in mathematics and computer science, along with their experience in robotics makes them an ideal partner. We look forward to working with their professors and their students to field Colorado's entry in the DARPA Urban Challenge."

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