

Master of Engineering in Robotics and Autonomous Vehicles



A New Interdisciplinary Graduate Degree Program Preparing Students to Lead and Succeed in an Exciting, Rapidly Expanding Field that Brings Technology to Life

Above: Team IVS's (Intelligent Vehicle Systems) entry in the 2007 DARPA Urban Challenge, an autonomous vehicle research and development program with the goal of keeping military personnel off battlefields and out of harm's way. Produced by technical experts in vehicle platforms, navigation, path planning, sensors, perception, and intelligent autonomous control for ground vehicles, the vehicle is a collaboration between Ford Motor Company, Delphi, U-M, and Honeywell Aerospace. Team IVS' vehicle was one of only 11 selected for the 2007 DARPA finals.

Get Ready to Step Into the Future

Graduates with a Master of Engineering in Robotics and Autonomous Vehicles will be well-prepared to step into the future. This is a booming field that promises to be the next growing frontier for engineers. The first generation of robotic applications in industry were used primarily for stationary manipulators such as robotic arms that replaced tedious labor, often in toxic environments.

The dawning of the second generation is rapidly setting robots free. Mobile robots capable of tactical behavior changes and autonomous vehicles are being developed. For the first time, ground robots are being used for military purposes. The future is bright in both the commercial and military worlds for graduates who have the educational training that will enable them to work on robotics and autonomous vehicles



Professor Jessy W. Grizzle, Jerry W. and Carol L. Levin Professor of Engineering of the EECS department, conducts feedback control research on bipedal locomotion.

Growing Demand for Robotics Technology Professionals

Intelligence through electronics will eventually be found in all future mechanical systems. In addition to commercial and military applications, widespread growth is anticipated in home, entertainment, and human assistance. Potential employers are eager to hire engineers with a relevant degree who can help them innovate and compete.

Michigan Engineering Builds Your Foundation for Success

Ranked among the top engineering schools in the country, the University of Michigan College of Engineering has a long tradition in robotics, artificial intelligence, and autonomous navigation, with a special focus on manufacturing reliability and powertrains. These strengths provide a unique advantage for students in this new program at U-M because the underlying technologies in robotics and autonomous vehicles significantly overlap those used in automobiles.

Course offerings include sensing, perception and cognition, intelligence and learning, mechatronics (mechanical engineering and electronic engineering) propulsion and power management, system integration, management, and financial analysis. A highlight for many students is the original industrially-relevant team project experience which includes industry/government participation.

Program Requirements

The degree requires 30 credit hours of course work with a minimum grade point average of 5.0/9.0 (i.e., a B average). No more than 6 credit hours in approved courses can be transferred from selected schools.

Admission Information

Applications are accepted for both the Fall and Winter semesters according to the following deadlines:

Fall Admission Deadline

- Domestic Applicants: July 1
- International Applicants: April 1

Winter Admission Deadline

- Domestic Applicants: October 15 (October 30 for 2008 only)
- International Applicants: September 15

Prerequisites for Admission

- 4-year Bachelor's degree in Engineering or Physical Sciences with a grade point average of 3.2 or higher
- Two letters of recommendation
- The Graduate Record Examination (GRE) general test is highly recommended but not required
- For international students, the Test of English Language Proficiency (TOEFL) or Michigan English Language Assessment (MELAB) is required

BRAND

The Ground Robotics Research Center (GRRC)

Established in 2008, the Ground Robotics Research Center (GRRC) conducts research in autonomous ground vehicles and robots. It provides a central focus for U-M's many robotic researchers and the opportunity to develop an educational program.

The GRRC is sponsored, in part, by the U.S. Army Tank-Automotive Research Development and Engineering Center (TARDEC). The University of Michigan leads the GRRC, which also includes partners from other academic institutions as well as industry.

The robotics conference attendees and targeted center participants include: ABB, John Deere, Ford, Foster-Miller, Inc., General Dynamics, General Motors, iRobot®, Microsoft®, Soar Technology and Toyota.

College of Engineering

The University of Michigan began teaching engineering courses in 1854. Today, the College of Engineering is ranked among the top engineering schools in the country. Michigan Engineering boasts one of the largest engineering research budgets of any public university, at more than \$130 million annually. It is home to 11 academic departments and two National Science Foundation Engineering Research Centers. The College plays a leading role in the Michigan Memorial Phoenix Energy Institute. Within the College, there is special emphasis on research in three emerging areas: nanotechnology and integrated microsystems, cellular and molecular biology, and information technology.

About Michigan Interdisciplinary and Professional Engineering (InterPro)

InterPro was established by the College of Engineering to facilitate the synergy of interdisciplinary programs and to develop programs that are responsive to the needs of industry and professional engineers.

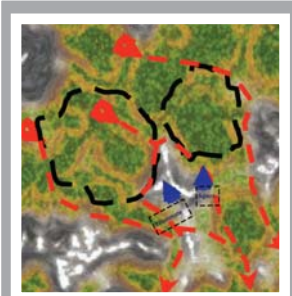
Graduate programs currently offered through InterPro include Automotive Engineering, Energy Systems Engineering, Financial Engineering, Global Automotive and Manufacturing Engineering, Integrated Microsystems, Manufacturing Engineering, Pharmaceutical Engineering, and Robotics and Autonomous Vehicles.

To learn more about the Master of Engineering in Robotics and Autonomous Vehicles, call RAV program director Huei Peng at (734) 936-0352, email roboautovehicles@umich.edu, or write to: Robotics and Autonomous Vehicles Program, 2645 CSE Building, 2260 Hayward Street, The University of Michigan, Ann Arbor, Michigan 48109

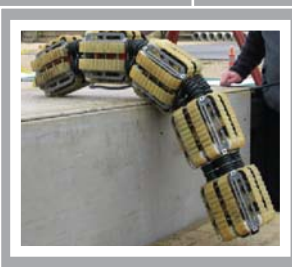


Examples of Robotic and Autonomous Research at U-M

Personal dead-reckoning system, Johann Borenstein, Research Professor, Mechanical Engineering



Advanced Tactical Behavior with Artificial Intelligence, John E. Laird, John L. Tishman Professor and Associate Chairman, Electrical Engineering and Computer Science



OmniTread serpentine robot, Johann Borenstein, Research Professor, Mechanical Engineering



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