FROM HEALTHCARE ASSISTANTS TO PLANETARY ROVERS

We’re developing intelligent solutions for society.

It is indeed a very exciting time for robotics and mechatronics. Researchers in both academics and industry are coming together to develop the next generation of human helpers that will be integrated into our daily lives. Why? To improve our quality of life both with respect to our jobs and our homes. We are making significant progress in developing more intelligent, flexible, modular and adaptive robots and devices for a wide variety of applications including medicine and healthcare, rescue and exploration, military and security, education, entertainment, and manufacturing.

The Institute for Robotics and Mechatronics was established by the Faculty of Applied Science and Engineering in 2010 to strengthen interdisciplinary research initiatives and enhance the student learning experience. IRM accomplishes this through collaborative research projects and innovative educational programs. IRM researchers are working on innovative sensing, actuation and computational capabilities for the next generation of mechatronic and robotic systems.

IRM offers students the opportunity to enrich their applied science and engineering education at the University of Toronto by undertaking a concentration of courses in robotics and mechatronics that will lead to an undergraduate Major or Minor and/or a graduate Emphasis in Robotics and Mechatronics.

IRM has and continues to establish industry partnerships that will maximize the impact of transformative technologies being developed by our world-renowned researchers.
The University of Toronto Institute for Robotics and Mechatronics (IRM) is a central hub for multidisciplinary robotics & mechatronics innovation, uniting over 45 faculty members across 6 departments and institutes.

“IRM researchers have been pushing the envelope with respect to the development of the next generation of autonomous systems, ranging from those that will help us here on Earth, to those that will allow us to explore neighbouring planets. For example, new intelligent environmental and robotic systems are being developed to address societal issues, such as assisting our rapidly increasing elderly population, while rovers explore never-before-seen environments looking for signs of life. There is also exciting work happening on the development of new actuator, control, and sensory technologies for automotive, medical and advanced manufacturing applications. These advances are making our cars, surgical devices, and machinery more intelligent, safer and easier to operate, while increasing overall performance.”

Professor Goldie Nejat, Canada Research Chair in Robots for Society
Director of IRM

RESEARCHERS IN ROBOTICS AND MECHATRONICS AT THE UNIVERSITY OF TORONTO HAVE THEIR ACADEMIC HOMES IN THE FOLLOWING DEPARTMENTS:

- Edward S. Rogers Sr. Department of Electrical and Computer Engineering (ECE)
- Department of Mechanical and Industrial Engineering (MIE)
- Institute for Aerospace Studies (UTIAS)
- Institute for Biomaterials and Biomedical Engineering (IBBME)
- Department of Computer Science (CS)
- Toronto Rehabilitation Institute (TRI)

Undergraduate and graduate study options are offered at U of T Engineering. For admission information, visit http://irm.utoronto.ca/for-students/.

- Undergraduate studies

MINOR IN ROBOTICS & MECHATRONICS
This area of study is open to all students in the Faculty of Applied Science & Engineering who are interested in pursuing a specialty in robotics and mechatronics. The program curriculum provides students with both introductory and advanced hands-on courses.

ENGINEERING SCIENCE MAJOR IN ROBOTICS
This major is open to all Engineering Science students. After completion of the Foundation Years (Years 1 & 2), students will be able to pursue a specialized Option in Robotics Engineering. The program curriculum is designed with a special focus on system integration through design and research opportunities.

GRADUATE STUDIES
EMPHASIS IN ROBOTICS & MECHATRONICS
Customize your Master of Engineering (MEng) with an emphasis in Robotics & Mechatronics. Students will develop knowledge in areas that are key to the development of smart and high performance systems, including Control Systems, Signal and Image Processing, Dynamics and Modeling, and Systems Integration.

IRM brings together academic researchers, students and industry to conduct a wide variety of exciting interdisciplinary research.

IRM’S CORE RESEARCH AREAS:

- Actuators
- Artificial Intelligence
- Assistive Devices & Robots
- Communications & Signal Processing
- Dynamics & Control
- Human-Machine Interfaces
- Human-Robot Interaction
- Manipulation
- Medical & Rehabilitation Systems
- MEMS; Micro-nanorobotics
- Multiagent & Multirobot Systems
- Personal Robotics
- Sensors & Instrumentation
- Space Robotics
- Unmanned Aerial Vehicles
- Vision and Image Processing

Pictured above, left to right: A micrograsper for pick-and-place micrometer-sized objects from Professor Yu Sun’s Advanced Micro and Nanosystems Laboratory; microgripper robots from Professor Eric Diller’s Microrobotics Laboratory; and a neuroprosthesis device for walking, developed in Professor Milos Popovic’s Rehabilitation Engineering Laboratory.