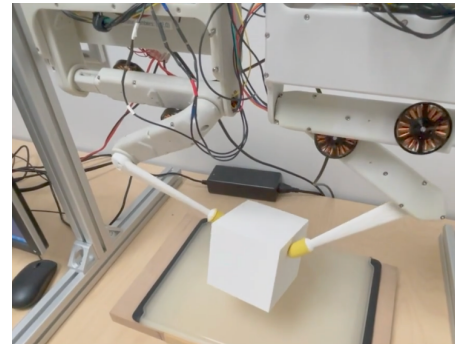
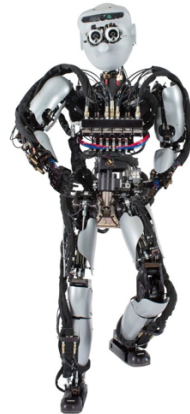
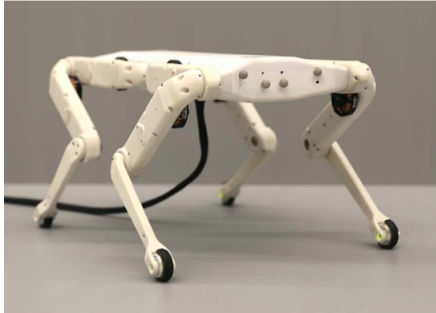


ROB-UY 2004 Robotic Manipulation and Locomotion Syllabus



Description This class introduces fundamental notions of robotics, from sensors and actuators to kinematics, dynamics and control with a focus on applications for object manipulation and legged locomotion. Concepts and algorithms necessary to the robotic practitioner, such as forward and inverse kinematics, force and impedance control, grasping and manipulation and legged locomotion, will be studied in the class. Further, a special emphasis will be put on providing practical experience in robotics. In the laboratory, the learned concepts will be implemented on a real 3 degree of freedom robotic finger (right picture). Students will learn how to use state of the art robotics software to solve problems seen in class.

Topics Covered

1. What is robotics? Sensors, actuators, algorithms.
2. The geometry of articulated robots / forward and inverse kinematics
3. Position, force and impedance control of robots
4. Legged locomotion
5. Grasping and manipulation
6. Robotic simulation and real robot control
7. Ethical questions in robotics

Prerequisites The class is open to students from any major with sufficient mathematics, physics and programming background: CS-UY 1114, MA-UY 2034 and PH-UY 1013 or equivalents (see Minor in Robotics)

Inclusion Statement I intend to create an inclusive and equitable environment for all students, where individuals of all backgrounds, socioeconomic status, ethnicities, national origins, gender identities, sexual orientations, religious and political affiliations, and abilities will be treated with respect. I hope to foster a sense of community where learning, helping and supporting each other is recognized and valued. All members of this class are expected to contribute to an inclusive and respectful environment. Your suggestions to improve the course are encouraged and appreciated. If you feel that this standard is not being upheld, do not hesitate to speak with me. <https://engineering.nyu.edu/about/diversity-inclusion>