



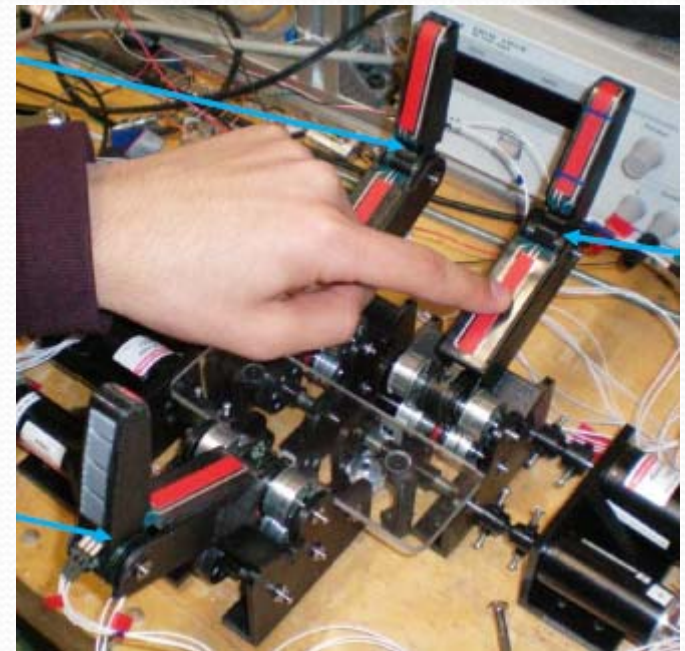
Robotic Hand Control Project

with Dr. Gary Bone (Mech Eng)

- Robotic hands will be a key part of next-generation robots for helping people at work and at home.
- An advanced robotic hand was built in a previous Mech. Eng. Capstone project.
- Features of the hand...

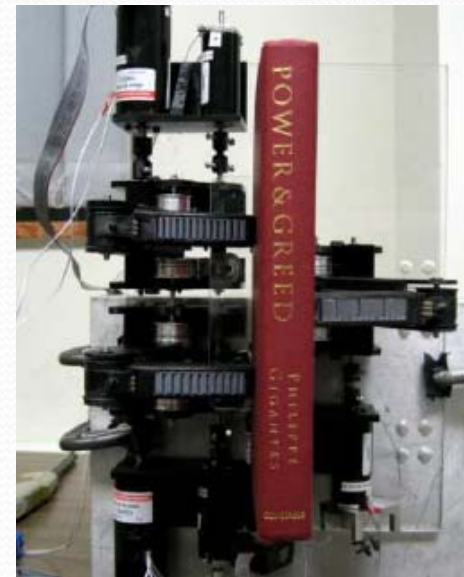
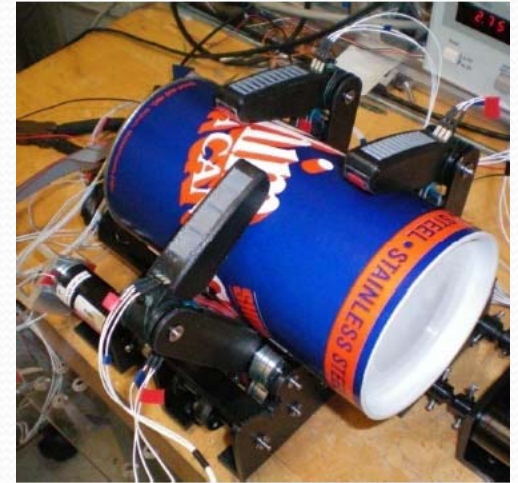
Robotic Hand Control Project (page 2)

- Hand features:
 - Three-fingers with two motorized joints per finger.
 - Tactile sensors capable of detecting contact and its location (shown at left in red).
 - Joint position and torque feedback
 - Sensors & motors are already interfaced to a PC.
- It is currently mounted on a simple robot that allows it to pick up and move objects (robot not shown)



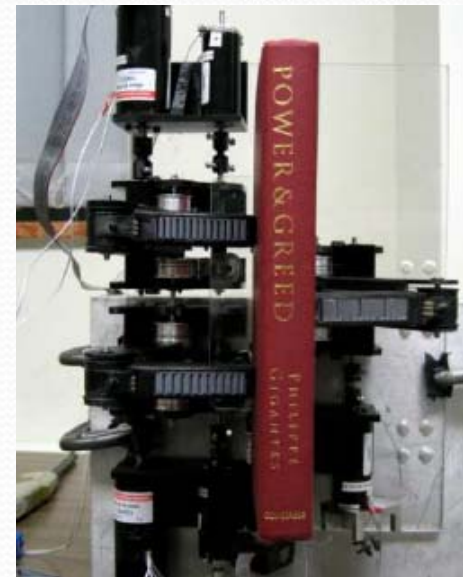
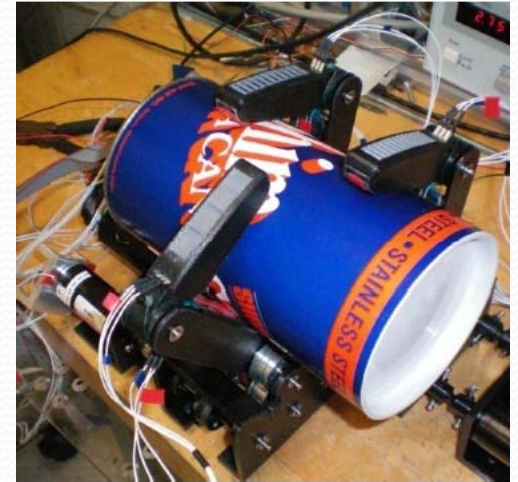
Robotic Hand Control Project (page 3)

- Possible ECE 4106 Project Topics:
 - Topic A) Writing and testing software (in C or C++) to intelligently control the fingers to allow the hand to automatically grasp a variety of household objects. This software will combine information about the object (e.g. shape, mass) with the hand's position, force and tactile feedback.



Robotic Hand Control Project (page 4)

- Possible ECE 4106 Project Topics:
 - Topic B) Writing and testing software (in C or C++) for guiding the robot and hand to grasp objects using computer vision. The images will be captured using one (or more) webcam(s).



Robotic Hand Control Project (page 5)

- Please note:
 - This is a special opportunity to use advanced robotic hardware (worth over \$4,000), and program it to do cool stuff!
 - This hardware is the property of Dr. Gary Bone, must be used properly, and may only be used in his lab. You may take pictures and videos of it for your 4I06 report(s) and presentation.
 - Some assistance will be provided by Dr. Bone.
 - Your course grade will come from your ECE Professors.
 - To contact Dr. Bone please e-mail: gary@mcmaster.ca