

ME 752: Mechanical Design of Manipulators and Robots

Winter Quarter 2010

Where and When: Scott Lab N0050 - Tue & Thurs, 2:30 - 3:48 PM

Instructor: Manoj Srinivasan Assistant Professor
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Course Website: Please see Carmen in Jan, 2010.



Honda's Asimo

Book: *Introduction to Robotics: Mechanics and Control, Third Edition*, J. J. Craig, Pearson Prentice Hall, 2005.

Course description: This course is an introduction to the mathematical and physical principles governing the analysis and design of mechanical manipulators and other robots. The course is broadly divided into three parts:

1. Kinematics in 2D and 3D (describing the possible movements of objects),
2. Dynamics in 2D and 3D (how objects move given forces),
3. Control (how to make objects move in a desired manner in different environments).



Canadarm, International Space Station

Applications to biomechanics, computer animation, etc., may be discussed briefly. We may also have special lectures and/or readings on specific robots.

Software: MATLAB (required). Students may obtain a free copy from OIT. This software will be used extensively for all numerical calculations and assignments. Human-readable MATLAB code will be accepted as homework answers, where appropriate. **Symbolic computer algebra package.** I recommend MATLAB's symbolic toolbox for uniformity (part of the student license), but other software may be used too, depending on prior familiarity.

Pre-requisites: A basic understanding of calculus, linear algebra, and ordinary differential equations is required. Familiarity with MATLAB will also be helpful.

Grading: Homework - 50%, Midterm Exam - 15%, Take-home Final - 20%, Mini-project presentation - 10%.