
Experimental Robotics (CS225A)

(Spring 2007-08)

Tu-Th 3:15–4:30 (Gates B12)

Instructor

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TA

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The purpose of this course is to provide hands-on experience with robotic manipulation. Tentative topics include kinematic and dynamic control of motion, compliant motion, sensor-based collision avoidance, motion planning, task specifications, and robot-human interfaces. In this course you will develop real time controllers for a simplified PUMA 560, a popular industrial manipulator.

This class is presented as a laboratory course consisting 6 lab assignments and a final project. Material will be based mainly, but not exclusively, on topics covered in CS223A. There is no midterm or final for this course. The prerequisites are CS223A, CS193U (CS193D) or equivalent.

A lab assignment will be distributed once a week and will be due one week later. In order to receive a grade at the end of the course, all lab assignments must be handed in.

CS225A Tentative Lecture and Lab Schedule

Tu Apr 01	Introduction to the course mechanics and content
Th Apr 03	Simulation Environment
Tu Apr 08	Hardware(Robot) Environment
Th Apr 10	Equations of Motion in Joint Space
Tu Apr 15	Joint Space Control
Th Apr 17	Project Discussion
Tu Apr 22	Velocity Saturation and Trajectory Generation
Th Apr 24	Project Discussion
Tu Apr 29	Operational Space Control
Th May 01	Obstacle Avoidance, Potential Fields, Finalization of Projects
Tu June 03	Final Project Demonstrations

Recommended References

CS223A Course Reader: Introduction to Robotics, Oussama Khatib

A Unified Approach for Motion and Force Control of Robot Manipulators: The Operational Space Formulation, Oussama Khatib, IEEE Journal of Robotics and Automation, Vol. RA-3, No. 1, 1987