

ME319 Course description

This course is for graduate students who have some familiarity with robotics and would like project experience with robotic and vision systems. The course will explore current topics and applications to flexible, automated manufacturing. The course emphasizes integration problems and techniques for fine motion control, calibration, acquisition of sensory data and programming. Additional lectures will cover research issues such as dexterous manipulation, haptic sensing and force control. The course grade is based mainly on lab projects & presentations.

- Prerequisites: CS223A or equivalent and competence in programming.
- Instructor: Mark Cutkosky, Terman 523, 725-1588, cutkosky@cdr.stanford.edu
- Course TA: Kimon Roufas, kroufas@leland.stanford.edu
- Credit: 3 Units
- Time: Thurs lectures 5:30¹-6:45 pm + lab sessions (schedule to be set up).
- Location: Lectures in Thornton 210 (conf. room in MML, 2nd floor across from Terman); labs in Robot & Artifact Dissection Lab behind building 530. Lab Phone is 723-4258.
- Enrollment: Max enrollment approximately 24, due to limited equipment.
- Text: We will use papers, books, class notes. Many documents will be available as HTML or PDF files at the course website: <http://cdr.stanford.edu/~cutkosky/me319>

Lectures

The lectures consist mainly of presentations on state-of-the-art applications or research topics (which we hope will become applications in a few years). The goal is to introduce these topics and to get the class thinking about relevant issues while working on the projects. Most of the presentations will be given by student teams, with background materials and coaching provided by the instructor.

Laboratory projects

The heart of the course is a series of four laboratory projects in which you will obtain experience with robotic equipment and an appreciation for what goes into programming a robust, event-driven robotic application. The first three projects are fairly structured. The fourth is open-ended and can lead in several directions, depending on the inclinations of your team. Due to limited equipment availability, you will be working on the projects in teams of 2-4 people.

Presentations

Presentation is a part of this course. Your group will do a formal demonstration/presentation of your solution to the fourth laboratory project + informal demonstrations of the first three projects. You will also get involved in presenting a research or development topic in one of the lectures.

Course philosophy

The point of this course is two-fold: to get acquainted with some R&D areas (where will robotics be 5+ years from now?) and to get hands-on experience with what's available today.

Grading:

Projects: 80% (1st 10%; 2nd 15%; 3rd 25%; 4th 30%); R&D topic presentations: 20%

Other courses in robotics this spring

CS225 Experimental Robotics -- O. Khatib (<http://robotics.Stanford.EDU/~ok>)

CS327 Advanced Robotic Manipulation -- O. Khatib.

¹First class will be held on Wednesday, April 2 at 5:45pm as listed in the Spring Course Schedule.