UCSB "Introduction to Robotics" ME170A/ECE181A, Fall 2011 Instructor: Francesco Bullo

This is the website for the UCSB course ME 170A / ECE 181A "Introduction to Robotics", Fall 2011 (lecture times during period: Th.22sep2011 through Fri.02dec2011). This information is available at the URL http://motion.me.ucsb.edu/ME170A-Fall2011. A pdf version of this documentation and of the ABET syllabus for this course is available on the course website.

Description

Motion planning and kinematics topics with an emphasis on geometric reasoning, programming and matrix computations. Motion planning: configuration spaces, sensor-based planning, decomposition and sampling methods, and advanced planning algorithms. Kinematics: reference frames, rotations and displacements, kinematic motion models.

Course Learning Outcomes

- An ability to apply knowledge of geometry, graph algorithms and linear algebra to robotic systems
- An ability to use a numerical computing environment, such as Matlab, to solve engineering problems
- An ability to formulate and solve planning problems in robotics
- An ability to formulate and solve kinematics problems in robotics

Prerequisites

Eng 3 and either ME 17 or ECE 130C (concurrent enrollment is allowed).
Knowledge of basic concepts in matrix theory (matrix multiplication, traces, determinants, eigenvalues), differential equations, and familiarity with Matlab programming.

Lecture Time and Place

Buchanan Hall 1930, TueTh 12:30pm-1:45pm

Course credit

Units: 4, including 3 units of lecture, 1 unit of computer lab per week

Textbook

Weekly lecture notes will be made available in pdf format.

Instructor

Professor Francesco Bullo
Department of Mechanical Engineering

Email: bullo-at-engineering.ucsb.edu
Website: http://motion.me.ucsb.edu

Office hours

Place: Room 2325, Engineering Bldg II Time: Tues 2:00pm-3:20pm
If you have any questions about the course, please send me email. I will try to respond as quickly as possible. Additionally, I will share questions that are particularly good (and their answers) with the rest of the class by broadcasting my answer to the entire class.
If you plan to come to office hours for questions about homework, please be prepared to show attempts at solving the problem that you prepared before coming.

Teaching Assistant

Anahita Mirtabatabaei, anaheata-at-gmail.com
Office hours Time: Wednesday 2pm-3pm and Thursday 2pm-3pm
Office hours Place: CAD Lab = "Auhll Student Center" (Engineering II Pavilion, room 1401)
Please come to office hours with prepared questions. Due to time constraints, only limited help will be given for Matlab debugging problems.

Grading

Your grade will be assigned roughly according to the following percentages.
1. Homework and Projects 40%
2. Midterm 30%
3. Final 30%
Partial credit might be given whenever the overall performance is low. If answers are not accompanied by satisfactory explanations (e.g., all intermediate steps, clearly readable handwriting), no credit will be given.
Exams and quizzes will be closed book and closed notes. You may prepare an exam aid (cheat sheet) in your own handwriting, consisting of one, one-sided sheet (letter size, 8.5x11in) for the midterm and one, two-sided sheet for the final exam. No calculators/tablets/cellphones are allowed during the exams (they would be useless anyway).
In exceptional cases, I reserve the right to give extra points for excellent performance on the final. Please, do not count on it as a way to avoid doing homework assignments.
Homework will be typically assigned on Thursday and will be due the following Thursday (7 days later). No late homework will be accepted without prior approval. Approval is automatic the first two times you ask: to announce late homework you must send me and Anahita (the TA) email by midnight the day before. Late homework will automatically lose 20% of the grade and no late homework will be accepted after 5pm on the following Monday.

Computer Access & Matlab

I expect all of you to be familiar with the College of Engineering computer laboratories. Some of the homework and all computer laboratory assignments will require working knowledge of Matlab.
A matlab primer is available in the handout section of the course website.

Collaboration Policy

Collaboration Policy for this course
Academic Dishonesty @ Wikipedia