EE193SIM Embedded Systems for Robotics
Fall Semester 2009

• Instructor: Professor Karen Panetta
  Email: karen@ece.tufts.edu
  Course URL: http://www.eecs.tufts.edu/~karen/Classes/EE193SIM
  Office: Room 236, Halligan Hall
  Office Hours: Monday 3:00-5:00, Thursday 3:00 – 5:00 pm

• Class:
  Meets: Tuesday and Thursday 1:30 – 2:45 pm
  Prerequisites: EE14, or Senior/Graduate level standing in Computer Engineering, Electrical engineering or Mechanical Engineering.
  Room: Room 105, Halligan Hall

It is expected that if you need to miss a class that you will email the professor before the class time.

• Text:

• Teaching Assistant: your peers

• Course Description And Tentative Topics:
  This course will introduce Robotic Systems for embedded systems and provide an opportunity for students to investigate the design of robots, systems, and sensors using a variety of hardware platforms and programming techniques.

  • Robotic Manipulators, applications and current state of the art
  • Degrees of freedom, links, joints.
  • Kinematics of manipulators
  • Mathematical models for robots
  • Dynamics
  • Animation models for trajectory control
  • The ICREAT platform
  • Robotic arm and end-effector
  • Sensors for vision systems
  • Algorithms for system control

• Projects:
There will be programming or hands-on development assignment every week. The programs will be written in the C/C++ language, MATLAB or other customized software associated with the hardware platform we are investigating. Late projects will be subject to a 10% per day penalty. Projects more than 3 days late will not be accepted. Guidelines and policies for projects will be posted on the class webpage. All hard copies of assignments must be time stamped in the main office. Projects will be team based and team will produce a report, with individual sections written by EVERY member of the team. Each section of the report will state who wrote which section with proper credit given to anyone who helped you.

**Quizzes:**
There will be a quiz given each week on Thursday. No make-up quizzes will be given. The best 5 quizzes will be counted.

- **Homework:**
  Homework problems will be assigned. They will range from book problems, research problems and select readings from IEEE Robotics Journals and conferences. Programming problems in MATLAB will also be assigned.

- **Examinations:**
  There will be NO examinations in this course. This is a graduate level course and it is expected that your individual course work and projects will demonstrate your proficiency with the material.

- **Handouts:**
  All handouts presented in class will be made available in the ECE office.

- **Course Grading:**
  The course grade will be determined by weighting coursework in the following way:

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<thead>
<tr>
<th>Course Grading</th>
<th>Percentage %</th>
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<tbody>
<tr>
<td>Projects</td>
<td>40%</td>
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<tr>
<td>Quizzes</td>
<td>15%</td>
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<tr>
<td>Presentations</td>
<td>20%</td>
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<td>Homework</td>
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