Human-Centered Robotics

CSCI 473/573, Spring 2017
Marquez Hall 235, Tue/Thurs 8:00 AM – 9:15 AM

Class Website: http://inside.mines.edu/~hzhang/Courses/CSCI473-573/

Instructor: Dr. Hao Zhang, Assistant Professor, EECS Dept.
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Email: hzhang@mines.edu
URL: http://inside.mines.edu/~hzhang
Office Hours: 3:30 – 5:30 PM Tuesdays or by appointment (send email)

Course Description:
This course focuses on the new field of Human-Centered Robotics (HCR), bridging together research and application of methodology from robotics, human-machine interaction, and cognitive psychology. This course covers basic concepts and computational models of 3D sensing, robot learning and cognition to perceive humans, understand human behaviors, and decision making and planning in response to humans or environment events.

Prerequisites:
CSCI 262 and Math 201: As a Computer Science robotics course, understanding of fundamental concepts of computer science (e.g., data structures) and experience of programming in C++ or Python in Linux is necessary. Mathematical maturity is also needed to understand the computational models. In this course, the instructor will not teach programming and will assume sufficient math knowledge.

Required Textbook:
None. The history of human-centered robotics is short. The course is project-based and research-oriented, generally focusing on the cutting-edge concepts and techniques from recent research papers. Due to this reason, many texts, pictures, and slides we use in the lecture are grabbed by the instructor from a wide variety of online sources. Major references will be provided.

Schedule and Assignments:
All materials (lecture, schedule and assignments) will be available on the course website. If you miss a lecture, it will be your responsibility to check the course website (make sure you refresh the webpages).

Class Communication:
Assignments will be submitted to Blackboard. You will also check your grades on the Blackboard. If you want to chat with the instructor, please stop by my office during the office hours. Or if the office hours do not work for you, send an email to the instructor to schedule a meeting.
Evaluation:

Grading will be based 100% on projects. Decisions on borderline grades will be based upon class attendance and participation. Students in CSCI 473 will be given the same projects, as those taking CSCI 573. However, the quality and/or quantity of the work expected is higher for CSCI 573 than for CSCI 473, and thus will be graded more strictly. Additional questions will also be asked for CSCI 573 students in projects.

Final grades will be determined by overall average as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>90 –100</td>
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<tr>
<td>B+</td>
<td>85 – 89.9</td>
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<tr>
<td>B</td>
<td>80 – 84.9</td>
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<tr>
<td>C+</td>
<td>75 – 79.9</td>
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<tr>
<td>C</td>
<td>70 – 74.9</td>
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<tr>
<td>D</td>
<td>60 – 69.9</td>
</tr>
<tr>
<td>F</td>
<td>0 – 59.9</td>
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</tbody>
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Decisions on borderline grades will be based upon class participation.

Class Policies:

• **Class attendance**: Class attendance will be taken. Decisions on borderline grades will be based upon exceptional class attendance and participation, as deemed merited by the course instructor. Of course, if you have a good reason to miss class (e.g., you are sick, or you need to present a paper at a research conference, or you have a job interview, etc.), then it is not a problem. Please don’t come to class if you think you have a contagious illness. We will work with you to help keep you posted on class activities and material covered. In any case, it is your responsibility to catch up (or keep up) with all course material and announcements covered in class.

• **Class participation**: Please participate in class discussions. The course is so much more interesting that way! As a bit of incentive, decisions on borderline grades will be based upon exceptional class participation, as deemed merited by the course instructor.

• **Project assignments**: Projects write-ups will be posted on the course website, along with the due dates. Most projects will involve programming; using C++ or Python is required (you will learn why we have this requirement in the course).

• **Due dates and Late Assignments**: All assignments are due at the date and time stated. Any assignments turned in more than five (5) minutes past the due date/time (according to the computer used for the submission) will receive a grade of zero.

• **Collaboration Policy**: Discussing ideas is encouraged. You may help each other with your strategy for how to solve the projects. You are expected to note significant collaborations by giving the name of your student collaborators on the project material you turn in. However, except if specifically allowed by the instructor, copying from any outside sources (e.g., fellow students, Internet, etc.) on any material to be graded is not permitted, and will be considered cheating. Cheating will be dealt with harshly, and will result in failure of the assignment and/or failure of the class. Each student is responsible for securing his or her work from copying. Each student is expected to abide by CSM’s Policy on Academic Integrity, provided online at:
Read the pledge below; it is based on the Student Honor Code passed by the ASCSM:

I pledge to uphold the high standards of academic ethics and integrity expressed by the Colorado School of Mines Student Honor Code by which I am bound. In particular, "I will not misrepresent the work of others as my own, nor will I give or receive unauthorized assistance in the performance of academic coursework". I understand that my instructor will report any infraction of academic integrity to the Department Head and that any such matter will be investigated and prosecuted fully.

The following policy exists for all CS courses in the Division of Computer Science:

1. If the project is an individual effort project, you are not allowed to give code you have developed to another student or use code provided by another student. If the project is a group project, you are only allowed to share code with your group members.
2. You are encouraged to discuss programming projects with other students in the class, as long as the following rules are followed:
   a. You view another student’s code only for the purpose of offering/receiving debugging assistance. Students can only give advice on what problems to look for; they cannot debug your code for you. All changes to your code must be made by you.
   b. Your discussion is subject to the empty hands policy, which means you leave the discussion without any record [electronic, mechanical or otherwise] of the discussion.
3. Any material from any outside source such as books, projects, and in particular, from the Web, should be properly referenced and should only be used if specifically allowed for the assignment.
4. If you are aware of students violating this policy, you are encouraged to inform the professor of the course. Violating this policy will be treated as an academic misconduct for all students involved.

- **Exams:** There will be no exams 🙌.

- **Grading corrections:** Bring any assignment grading correction requests to the instructor within 1 week of receiving the grade, or before the end of the semester, whichever comes first. After that, your grade will not be adjusted. If you find any mistake in grading, please let the instructor know. Your grade will not be lowered.

- **Using computers/phones in class:** Please be respectful of your colleagues in class, by turning off your phones and using your computers only for taking notes or keeping up with the material covered in class. Checking your email, working on other non-class related materials, web-surfing, etc., are not appropriate activities for class time. Be a good citizen, and practice courteous cell phone and computer etiquette!