Human-Centered Robotics

CSCI 498B/598B, Fall 2014
Marquez Hall 126, Mon/Wed/Fri 1:00 PM – 1:50 PM

Class web page: http://inside.mines.edu/~hzhang/Courses/CSCI498B-598B-Fall14

Instructor: Dr. Hao Zhang, Assistant Professor, EECS Dept.
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Course Description:
This course focuses on the emerging field of Human-Centered Robotics (HCR), bridging together research and application of methodology from robotics, human factors, human-computer interaction, and cognitive psychology. This course covers basic concepts and computational models of 3D robotic sensing, robot learning and cognition to perceive humans, and understand and react to human behaviors in human social environments.

Prerequisites:
Familiarity with basic concepts of computer science (e.g., data structure and algorithms from CSCI 262) and mathematical maturity commensurate with the successful completion of MATH 323 or its equivalent. The ability to program in Robot Operation System (ROS) under Ubuntu is necessary if you want to use real robots in your term project.

Required Textbook:
None. The course is project-oriented and research-oriented, generally focusing on the cutting-edge concepts and techniques from recent research papers.

Schedule and Assignments:
Refer to the course website for lecture schedule and assignments

Class contact/discussion lists:
Some class announcements will be sent out via the class BlackBoard website. This website will be used for turning in most assignments. Be sure you receive the test message during the first week of classes.

Evaluation:
Grading will be based 80% on projects and 20% on paper reading assignments and presentations. In particular, Project 1 counts 15%, Project 2 counts 25%, and the Term Project counts 40%.
Students taking the class for undergraduate credit will be assigned the same projects and reading assignments as those taking the class for graduate credit. However, the quality and/or quantity of the work expected is higher for graduate students than for undergraduates, and thus will be graded more strictly. Additional questions will also be asked for graduates in the projects.

Final grades will be determined by overall average as follows:

- **A**: 90 – 100
- **B+**: 85 – 89.9
- **B**: 80 – 84.9
- **C+**: 75 – 79.9
- **C**: 70 – 74.9
- **D**: 60 – 69.9
- **F**: 0 – 59.9

Decisions on borderline grades will be based upon class participation

The instructor reserves the right to curve grades upward, if deemed appropriate by the instructor. The curving of grades will take place on two separate scales -- one for graduate students and the other for undergraduate students.

**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. Just let the instructor know as soon as you know you will need to miss class. 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 handed out in class and posted on the course web site, along with the due dates. Project 1 will involve presentations and discussions in class. Project 2 and Term Project will involve programming; we will strive to be flexible on the programming language, although working on robots requires particular languages, including C++ or Python in Ubuntu. Project 1 will be a group assignment and Project 2 will be done individually. The Term Project will be flexible in choosing topics and can be done individually or in a group.

- **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 and exchanging 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 may 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.

- **Exams:** There will be no exams or quizzes 😊.

- **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!