



**Social Robotics
Psychology 734
Spring 2015**



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Office Hours: Tuesday 10:30 – noon and by appointment
Class Time: M 4:30 – 7:10 PM
Location: David King Hall 2073A

Course Objectives

The goal of the seminar is to introduce students to contemporary approaches in social robotics to build and evaluate robots that are human-like, cognitive, and intuitive to interact with. The course is designed for graduate students in psychology, neuroscience, computer science and engineering and consists of theoretical and practical parts: The first half of the course outlines psychological and neuroscientific aspects underlying Human-Robot Interaction with a special focus on the role of gaze direction in mentalizing about others' internal states. The course also covers standard methods and paradigms used in social robotics research. Key areas that will be discussed include the understanding of intentions (mentalizing, theory of mind), actions (i.e., mirror neurons) and emotions. The course also highlights prominent disorders of social function, such as autism and discusses ways how social robots can be used in clinical psychology to train patients with these disorders. The second half of the course will be devoted to a research project involving a social robot (or pictures, video clips, stories of social robots). Students will develop a research question and investigate it in teams of two: they will plan and conduct a behavioral experiment, analyze and interpret data and write a research report. Depending on the quality of the findings, the report can be submitted to a conference or a social robotics journal.

Reading Assignments

No textbook is required for this course. Reading assignments include peer-reviewed journal articles and other published reports. Readings are due to when listed in the Syllabus. Students are encouraged to schedule regular times during the week for reading and taking notes on the articles, and to discuss them with classmates prior to class when possible. Students are always encouraged to attend my office hours to discuss any of the topics related to the course, including reading assignments. All reading assignments should be completed before class. Students are encouraged to search for additional reading along their personal interests to supplement the articles assigned in class.

Course Assignments and Grading

Assignments: There will be several graded assignments during the semester, including presentations and classroom projects (due dates will be announced in class). These assignments contribute 25% towards students' course grade.

Semester Project: Students will conduct a research project on a social robotics topic (in groups of 2). The project will be documented by a written report and oral presentation to the class. Further details regarding the project will be provided in class. The semester project contributes 65% towards students' course grade.

Participation / Discussion of Reading Assignments: Class participation is essential. Students are encouraged to actively participate in the class. Students are also encouraged to engage with classmates and the professor outside of class and take full advantage of opportunities that will arise during the semester to participate in activities related to the course. Participation in class contributes 10% towards students' course grade.

Attendance

Attendance of all scheduled seminars and class activities is required and essential to successfully learn the concepts covered by this course. Students must arrive on time and be ready to participate at the start of the class. As a courtesy, one unannounced/unexcused absence will be allowed for each student, after which each additional unexcused absence will result in the loss of one letter grade per day. In addition, it is highly advised to contact me BEFORE all absences to accommodate any assignments or other graded material that might not be completed due to the absence. Any assignments that are delayed due to an unexcused absence, even a first offense, will receive no credit unless other arrangements have been made in advance.

Communication and Technology

Official Communications via GMU Email: Mason uses electronic mail to provide official information to students. Examples include communications from course instructors, notices from the library, notices about academic standing, financial aid information, class materials, assignments, questions, and instructor feedback. Students are responsible for the content of university communication sent to their mason email account, and are required to activate that account and check it regularly.

Technology: Projector and audio system (for videos) will be used to present slides with course material in class. Students need to bring the slides for the presentation of their semester project on a storage device. For the practical part, lab equipment (i.e. computer, keyboard, joystick) and a robot platform will be used.

GMU Honor Code

George Mason University has an Honor Code that each student accepts as a condition of enrollment. This code is consistent with APA's ethical principles for working professionals, and it is required that each student adhere to the Honor Code. For this course, group collaboration (such as during a group project or during routine discussions of reading assignments) is expected and encouraged, but all students are required to produce original work on all assignments unless otherwise noted. Plagiarism, academic dishonesty, and other failures to follow the GMU honor code will result in disciplinary actions that are likely to include receiving a failing grade for this course, along with referral to the GMU Honor Committee for further review and documentation of the offense. A lack of knowledge about what constitutes a violation of the GMU honor code is not a defense against possible violations; it is your responsibility as a GMU student to review and adhere to this code. If you have any questions about plagiarism or the GMU honor code, I encourage students to review the code for themselves at <http://academicintegrity.gmu.edu/honorcode/> or to see me for clarification.

Performing at Your Best

Learning Accommodations: It is our policy to accommodate all students with disabilities that might affect their learning, course participation, or assignment completion. If you are a student with a disability and you need academic accommodations, please feel free to speak with me to make appropriate accommodations and contact the Disability Resource Center (DRC) at 703-993-2474, or online at <http://ods.gmu.edu>. Most academic accommodations will be arranged through that office.

Stress and Academics: Being a student today can be stressful and life events can create anxiety or depression that can hurt anybody's academic performance. GMU is committed to helping students maintain their emotional well-being through the GMU Counseling and Psychological Services (CAPS) office, located online at: <http://caps.gmu.edu/> and by telephone at: 703-993-2380. CAPS services are highly regarded, and free to Mason students. They include both one-on-one stress and anxiety counseling and Academic Skills Workshops that can teach you how to 'study smarter' and make the most of your investment in higher education.

Improving Academic Writing: Strong writing is a skill that is learned through guided instruction and practice. Strong writing skills are beneficial for students pursuing academic or industry careers. Students who seek to improve their writing are encouraged to do so by visiting the GMU Writing Center. Information can be found online at: <http://writingcenter.gmu.edu/>

Course Outline

This course covers a range of topics related to Human Factors in Social Robotics, such as attribution of mental states, intentions, emotions and action goals to the robot. It also provides information about fundamental cognitive principles underlying social interaction. A detailed schedule of readings can be found in the table below. The schedule of other weekly assignments (projects, presentations) will be made available in class. Changes to the assignments will be announced in advance.

Add and Drop Deadlines

Last day to add is **January 26th**, last day to drop with no tuition penalty is **February 19th**

Weekly Schedule and Assignments

Weekly class meetings are generally split into two sections: a discussion of assigned readings, followed by a lecture or classroom project activities. After Spring Break, the focus will be on running experiments and analyzing data. The instructor reserves the right to make minor adjustments to the schedule of assignments. Changes will be announced in class.

Date	Topics	Reading & Assignments
1/25	Course Overview: Requirements, Syllabus, Project	
2/1	Introduction: What are social robots? <i>Lecture and Discussion</i>	Fong et al (2002) . A survey of socially interactive robots. Fink (2012) . Anthropomorphism and Human Likeness in the Design of Robots and Human-Robot Interaction
2/8	Neuroscience of Social Behavior <i>Lecture and Discussion</i>	Adolphs (2003) . Cognitive Neuroscience of Human Social Behavior Breazeal et al (2000) . Infant-like Social Interactions between a Robot and a Human Caregiver
2/15	Social Robotics: Understanding internal states <i>Lecture and Discussion</i>	Scasselatti (2000) . Theory of mind for a social robot Short et al (2013) . Not fair! Interaction with a cheating robot.
2/22	Social Robotics: Understanding actions <i>Lecture and Discussion</i>	Frith et al (2003) . How we predict what other people are going to do. Kupferberg et al (2013) . Do robots have goals? How agent cues influence action understanding in non-human primates.
2/29	Social Robotics: Performing actions together <i>Lecture and Discussion</i>	Knoblich et al (2011) . Psychological Research on Joint Action. Kupferberg et al (2012) . Moving just like you
3/7	Spring Break	
3/14	Social Robotics: Learning social skills <i>Lecture and Discussion</i>	Lungarella et al (2001) . Beyond pointing, gazing, and reaching Calinon et al (2006) . Teaching a Humanoid Robot to Recognize and Reproduce Social Cues

3/21	Social Robotics: Application <i>Lecture and Discussion</i>	Scassellati et al (2012). Robots for use in autism research TBA
3/28	Project <i>Research Question, Experimental Design</i>	
4/4	Project <i>Programming</i>	
4/11	Project <i>Data Collection</i>	
4/18	Project <i>Data Analysis</i>	
4/25	Project <i>Writing Report</i>	
5/2	Final Presentation	Project Presentation and Report DUE