Introduction to Human-Robot Interaction V 3.0

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Reid Simmons
Illah Nourbakhsh

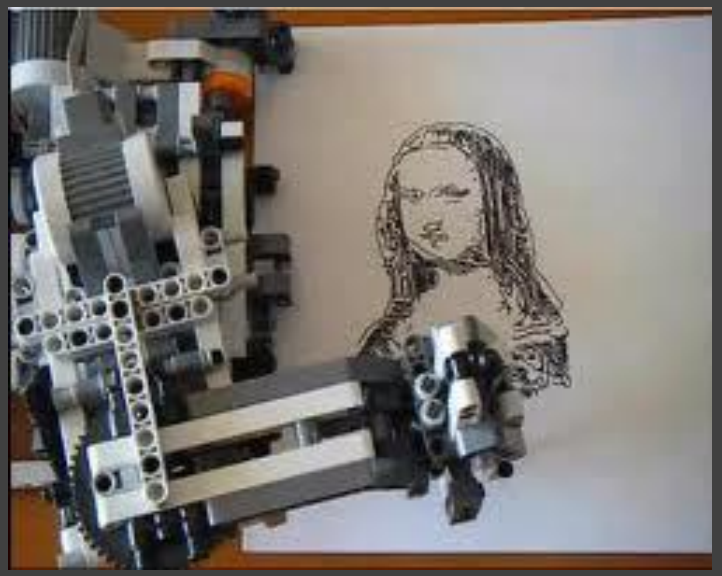
People Introductions

What is HRI?

- Proposed definitions?
- Key **questions** when creating HRI system?

What is HRI?

- It is an application area



What is HRI?

- It is a new field of inquiry

What is HRI?

- It is boundary work

Boundaries shift…

Small Groups Project
boundary and agency

- [What is *agency*?]
- Identify an existing commercial device that may, in the next decade, be infused with agency and thus become an HRI component.
  - What are the technology enablers?
  - Why agency?
  - Identify a socially dystopian case.

Course Details

- Our goals
- Our responsibilities
- Your responsibilities
- Evaluation

Course Details

- Our goals
  - Breadth over depth for your future planning
  - Context relevant to any engineering future
- Our responsibilities
- Your responsibilities
- Evaluation

Course Details

- Our goals
- Our responsibilities
  - Second year real-time course tweaking
  - Give us suggestions and we will incorporate
- Your responsibilities
- Evaluation

Course Details

- Our goals
- Our responsibilities
- Your responsibilities
  - Class attendance and active participation
  - Homework
  - Four major group activities, culminating in a final project
  - Written and in-class activity & project presentations
- Evaluation

Course Details

- Our goals
- Our responsibilities
- Your responsibilities
- Evaluation
  - Participation, homework, projects
  - Effective teamwork
  - Final group presentation

Syllabus & website tour

(search “16-467 HRI”)

HRI Course Subjects

- Expression and Gaze
- Proxemics
- Speech
- Perception
- Interaction Design
- Manipulation
- Decision-making
- Mental Models
- Perspective-taking
- Systems Engineering
- Robot Futures & Singularity
- Shared Autonomy
- Exoskeletons & Assistive Robotics
- Educational Robotics

AmaZoogle Home Delivery

AmaZoogle Tall Poles?

- Expression and Gaze
- Proxemics
- Speech
- Perception
- Interaction Design
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HRI Project & Homework

- Thematic choices for semester-long focus:
  - Trust
  - Empathy
  - Reliability

HRI Project & Homework

- Five team milestones
- Homeworks:
  1. Project proposal
  2. Interaction design spec
  3. Automation design x 2
  4. Research protocol
- Final Project Execution, Analysis and Presentation

HRI Study Example

No Fair!!
An Interaction with a Cheating Robot

Elaine Short, Justin Hart, Michelle Vu, Brian Scassellati
Department of Computer Science
Yale University
New Haven, CT 06511
elaine.short@yale.edu, justin.hart@yale.edu, michelle.vu@yale.edu, scaz@cs.yale.edu

***Abstract*—Using a humanoid robot and a simple children's game, we examine the degree to which variations in behavior result in attributions of mental state and intentionality. Participants play the well-known children's game "rock-paper-scissors" against a robot that either plays fairly, or that cheats in one of two ways. In the "verbal cheat" condition, the robot announces the wrong outcome on several rounds which it loses, declaring itself the winner. In the "action cheat" condition, the robot changes its gesture after seeing its opponent's play. We find that participants display a greater level of social engagement and make greater attributions of mental state when playing against the robot in the conditions in which it cheats.**

***Index Terms*—Affective & emotional responses, Beliefs about robots, Mental models of robot behavior**

object that it has selected. This "nonverbal leakage" is a subtle expression of mental state on the part of the robot. Proto-social responses have also been used to increase the human participants' feeling of engagement, as well as the length of time they fix their attention to a robot [4]. Breazeal [5] uses affective communication to create engagement between naïve participants and a humanoid robot. Mental state attribution may also play a role in studies that observe other phenomena. In their study of humans teaching robots, Kim, Leyzberg, Tsui, and Scassellati found that participants speak more to a robot that has trouble performing a learning task [6].

Simple experiments involving the motion of shapes across a computer screen or stage have also been used to probe

..video