

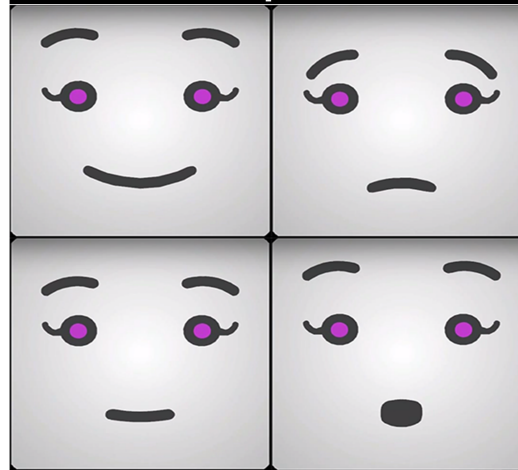
Introduction

- In order to communicate effectively with people, social robots need more than just a voice and body.
- Social robots that use facial expressions, sounds, and gestures may be able to communicate more effectively.

Objective

- The goal of this study is to have a social robot that can accompany dialogue with non-verbal features.
- Another objective is to observe how people react to a robot displaying these features during a conversation.

Facial Expressions



Methods

- Experiment 1 - the objective is to understand how the features affect the conversation experience.
- Experiment Groups:
 - Facial expressions only
 - Facial expressions and sounds
 - Facial expressions and gestures
 - Face, gestures, and sounds
- Task - SARAH asks a person to help it learn to recognize objects in a picture. The features are used throughout the task.
- Environment - the hallway between Wold and Olin. A non-lab setting was chosen to increase external validity.

SARAH the Social Robot



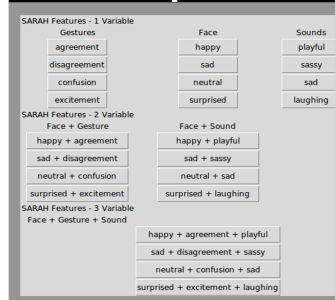
- A web cam records the interactions.
- This location gives SARAH ample room to room.

- SARAH invites student to participate in her task.



- Students often use gestures themselves when talking to SARAH.

Experiment GUI



- This GUI is used to control the expression of SARAH's features.
- The GUI is controlled remotely.

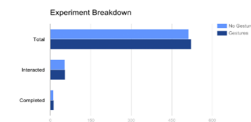
Gestures

- Four types of gestures - agreement, disagreement, confusion, and excitement.
- Agreement: quick forward/back movement
 - Disagreement - side to side movement
 - Confusion - slow turn left with quick return
 - Excitement - a quick full spin

Experiment Results

Results - Number of Participants

- With Gestures
 - 522 people walked by
 - 55 people talked to SARAH
 - 13 completed the task
- Without Gestures
 - 513 people walked by
 - 54 people talked to SARAH
 - 11 completed the task



- 10% of people that walked past SARAH interacted with her.
- 20% of people who talked with SARAH completed the experiment task.
- People's perception of SARAH's intelligence and naturalness did not change based on whether gestures were used.
- The longer people are around SARAH, the more comfortable they appear.
- People feel more comfortable around SARAH in groups.