

Attracting Human Attention Using Robotic Facial Expressions and Gestures

Goal

- Social robots that interact with humans appropriately - engaging in conversation is one such interaction
- Focused on attracting people's attention as they walk by in order to engage them in a quick conversation
- Will turning to verbally greet them as they pass attract their attention more than a simple verbal greeting with no movement?



Figure 1. SARAH interacting with a human.

SARAH

- Socially Appropriate Robot that Approaches for Help
- Features a screen with her face (robot_face), synthesized voice (festival text-to-speech) output through speakers, movement capabilities, and a number pad for external input

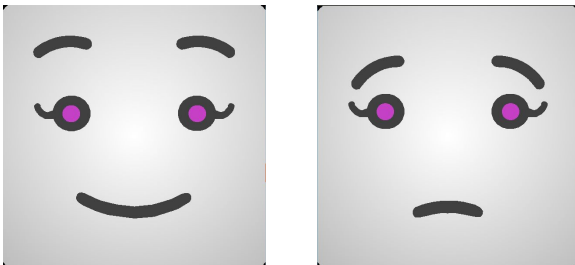


Figure 2. SARAH smiling and frowning, respectively.

Experiment

- SARAH stood Wold Center, greeting people verbally and smiling as they passed by her
- I controlled her from the nearby CROCHET lab -- people I greeted were within SARAH's field of view, since that was all I could see from the camera
 - Controls of SARAH's face were performed through a GUI that could control her facial expressions and her speech (fig. 5)
- SARAH would say "hello! can you please help me?":
 - While staying completely stationary
 - Turning to follow the person during the greeting, to mimic eye gaze
- When someone approached with her, she would ask them to complete a simple task where they had to press a number on her keypad
- If the participant pressed the right key, she would thank them with a smile



Figure 4. SARAH waiting patiently in Wold to greet people.

Data Collection and Analysis

- Audio and video were recorded, but only kept for analytical purposes
- People passing by, people who looked, and people who helped were all counted

Results

- Empirical Results:
 - Total # people who passed by: 1658
 - Total # people who looked: 714
 - No movement: 39.03%
 - Movement: 46.85%
 - Total # people who helped: 108
 - No movement: 6.36%
 - Movement: 6.66%
 - Helped/Looked, no movement: 16.29%
 - Helped/Looked, movement: 14.21%
- Anecdotal Results:
 - Helped, common reactions:
 - "That's it?"
 - Wave, thumbs up, to acknowledge the thanks
 - Confusion, and slight fear
 - Looked, common reactions:
 - Waving, thinking she only wanted a greeting
 - Taking a picture/video with their phones, but not helping
 - Surprise and/or strong refusal to help
 - Passed, common factors:
 - Wearing headphones
 - Focused on getting to destination
- Limitations:
 - No environmental cameras
 - Speakers not loud enough
 - Lag time

Conclusions

- Movement increases looks but does not correlate to an increase in interaction
- The novelty of being a robot is both an asset and detriment for SARAH
 - A number of people were attracted to her while others were scared of her because she's a robot
 - "Ah, it's a robot!" was said both with positive and negative inflections

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