

a story telling robot: modelling and evaluation of human-like gaze behaviour



motivations

- social functions of gaze behaviour
- gaze and task performance
- previous work on simulating gaze behaviour in agents and robots
- How are human-human and human-robot interactions related?

social functions

- communicating syntactic signals like verbal utterances and emphasis
- based on the structure and the content of the utterance.
- communicating interpersonal attitude or affect between speaker and listener
- indicating speakers attitude

task performance

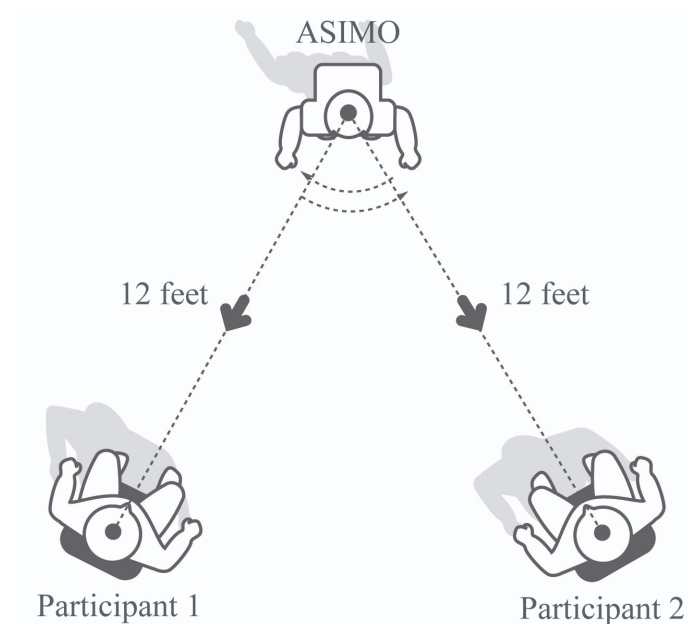
- Students were shown to recall significantly better the details of a story when the teacher made eye contact with them/when they received gaze.

hypothesis

- Participants who are looked at more will perform better in the recall task.
- Participant who are looked at more will evaluate ASIMO more positively.

the experiment

- 20 subjects, 12 males, 8 females
- 2 conditions, looked-at 20% of the time, and looked-at 80% of the time
 - 2 further conditions, male and female!
- 4 male and 3 female participants were students of technical majors.
- pre and post experimental questionnaires
- recall task after listening to another story



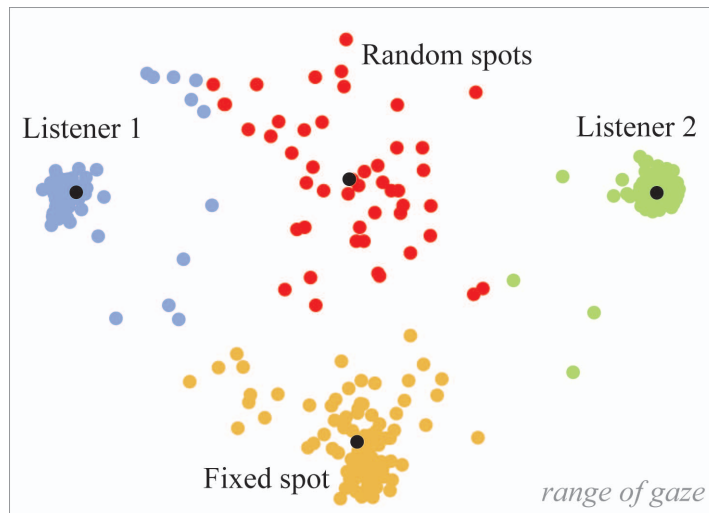
method

- based on Cassell et. al.'s empirical gaze behaviour model:

```
for each proposition do  
  if proposition is theme then  
    if beginning of turn or distribution(0.70) then  
      attach a look-away from the listener  
    end if  
  else if proposition is rheme then  
    if end of turn or distribution(0.73) then  
      attach a look-toward the listener  
    end if  
  end if  
end for
```

method

- and analyzing gaze data from a professional story teller.

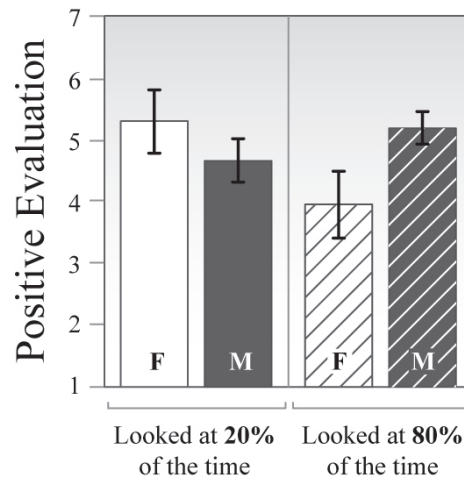
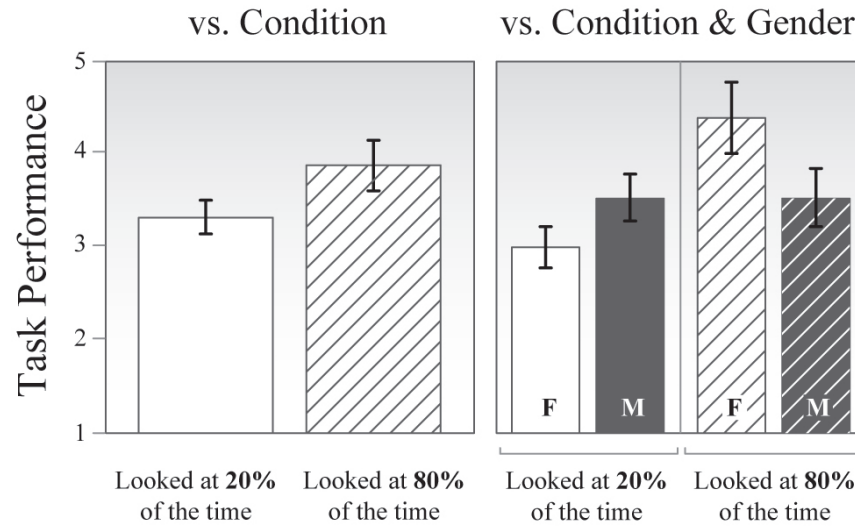


	Listener 1	Listener 2	Fixed spot	Random spot
Frequency (%)	13	11	38	38
Length (%)	38	27	30	5
Min (ms)	477	484	242	360
Max (ms)	15,324	5,914	13,674	4,383
Mean (ms)	2,400	2,262	2,640	1,072
Approx. StDev (ms)	500	500	500	250

TABLE I

LENGTH AND DISTRIBUTIONS OF GAZE AT EACH LOCATION.

results



Condition □ 20% ▨ 80% Participant Gender □ F ■ M

other results

- Positive evaluations of ASIMO were highly correlated with participant's video gaming experience and not with their computer use.

problems

- due to physical design of the robot
 - limited gestures
 - not completely human like gaze
- Some aspects of human story teller's gaze were not taken into account.