

Just follow the suit!

Trust in Human-Robot Interactions during Card Game Playing

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Motivation

- Aging population
- Technology can contribute to their Quality of Life



Motivation

- Social isolation
- Free time with entertaining activities



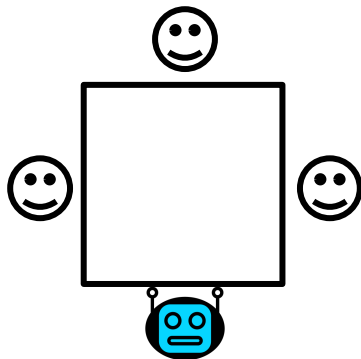
Motivation

Older adults like to play card games...



Motivation

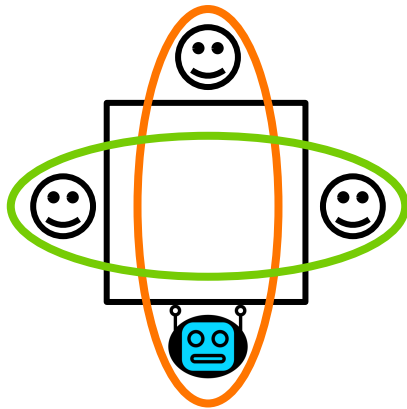
- Develop a robotic card game player to help reconnecting people



Motivation

Sueca is a portuguese well-known **card game** among the **elder population**

- Hidden-information game
- 2 teams
- Win the game
- Partnership and trust

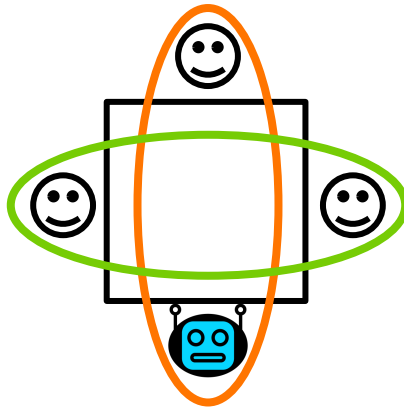


Goal

- Create an autonomous social robot that plays a card game
- Evaluate trust levels of participants towards their partners!!

We want to compare trust...

human-robot interaction VS **human-human interaction**



Design

How do we play Sueca?



User-centered study



Players' behaviour

Physical space

Design

User-centered study:

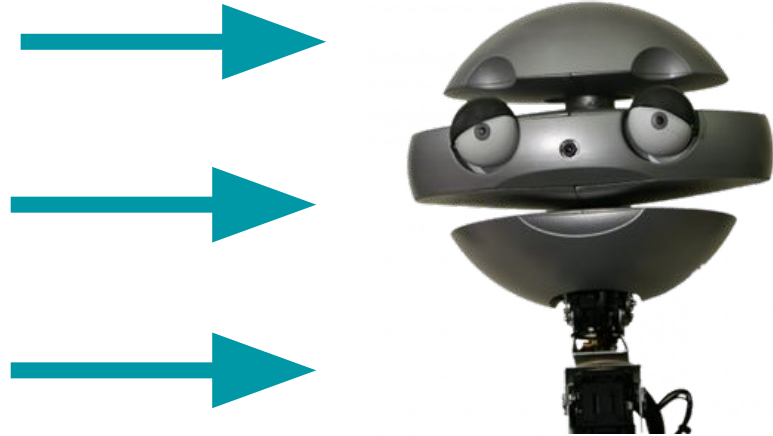
- It took place in an Elder Care Center
- 4 male participants played 10 games during 30 minutes



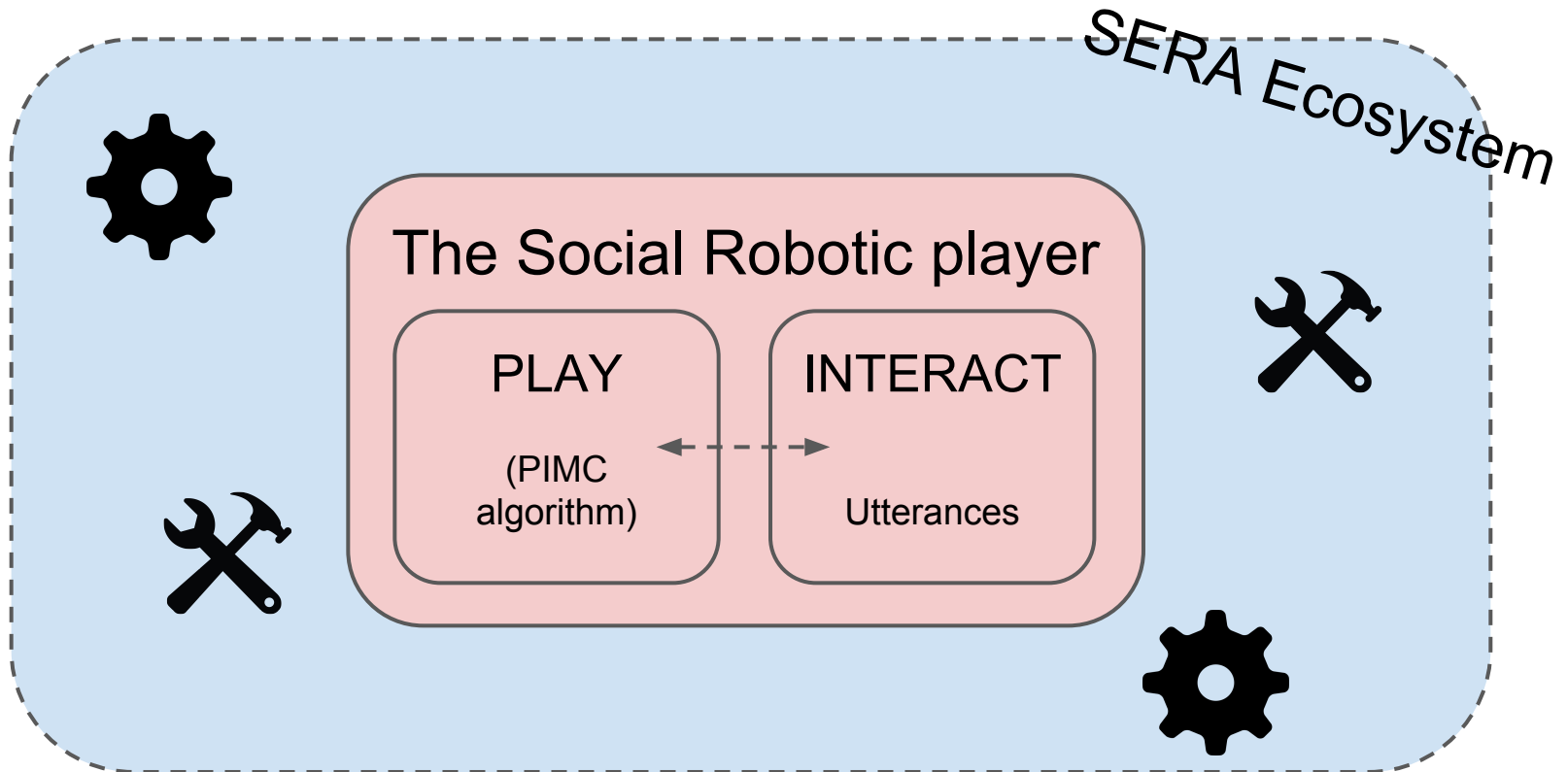
Design - Behavior

Behavioral analysis of the videos:

- Verbal and non-verbal behaviors
- Relevant game events
- Different tones while interacting
 - Encouragement towards partners
 - Competitiveness towards opponents



Development



Evaluation

Study 1 - Lab study

Study 2 - Into-the-wild study

(1) Lab study

- Controlled lab setting

Sueca...
...team game!

- Participants' trust towards partners

(1) Lab study

Each session:

- 3 participants
- 1 hour

X 20

60 participants

(M=24.31, SD=3.852;

20 females, 39 males, 1 unknown)



(1) Lab study

Procedure:

1. Draw to choose partner
2. First questionnaire
3. Explain the game rules
4. Play 5 games
5. Final questionnaire

(1) Lab study

Measures:

- Human-Robot Trust Questionnaire [Schaefer, K., 2013]
- PANAS Questionnaire [Egloff, B., 1998]
- Demographic questions
 - Previous knowledge of partner

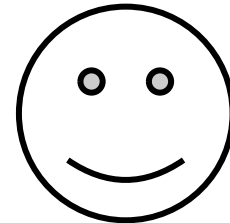
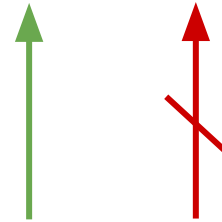
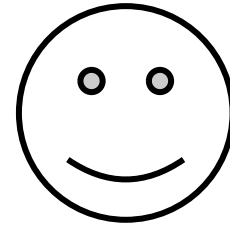
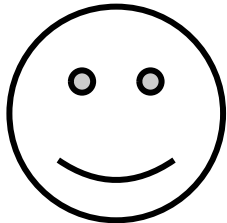
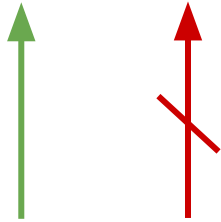
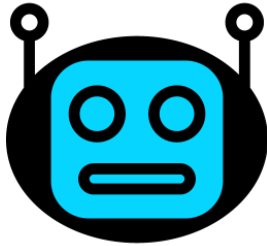
Results

Robot team won

12 sessions out 20 (60%)

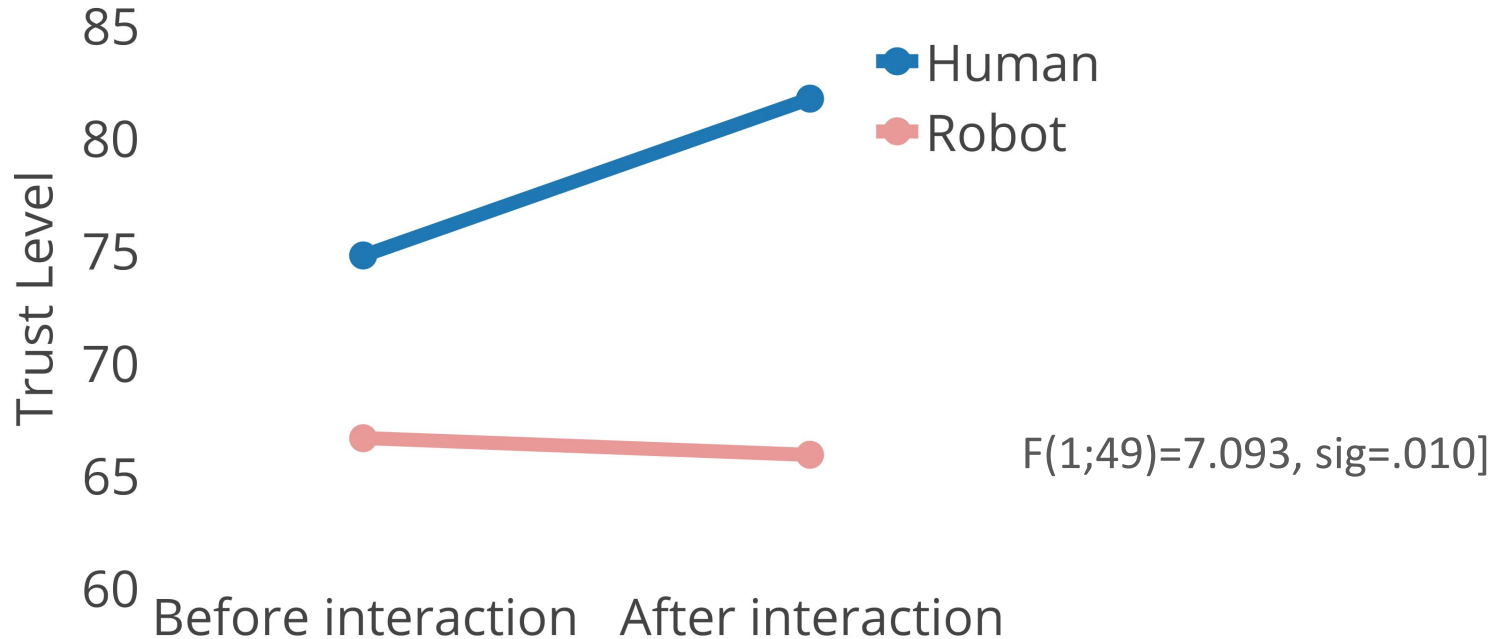


Trust results



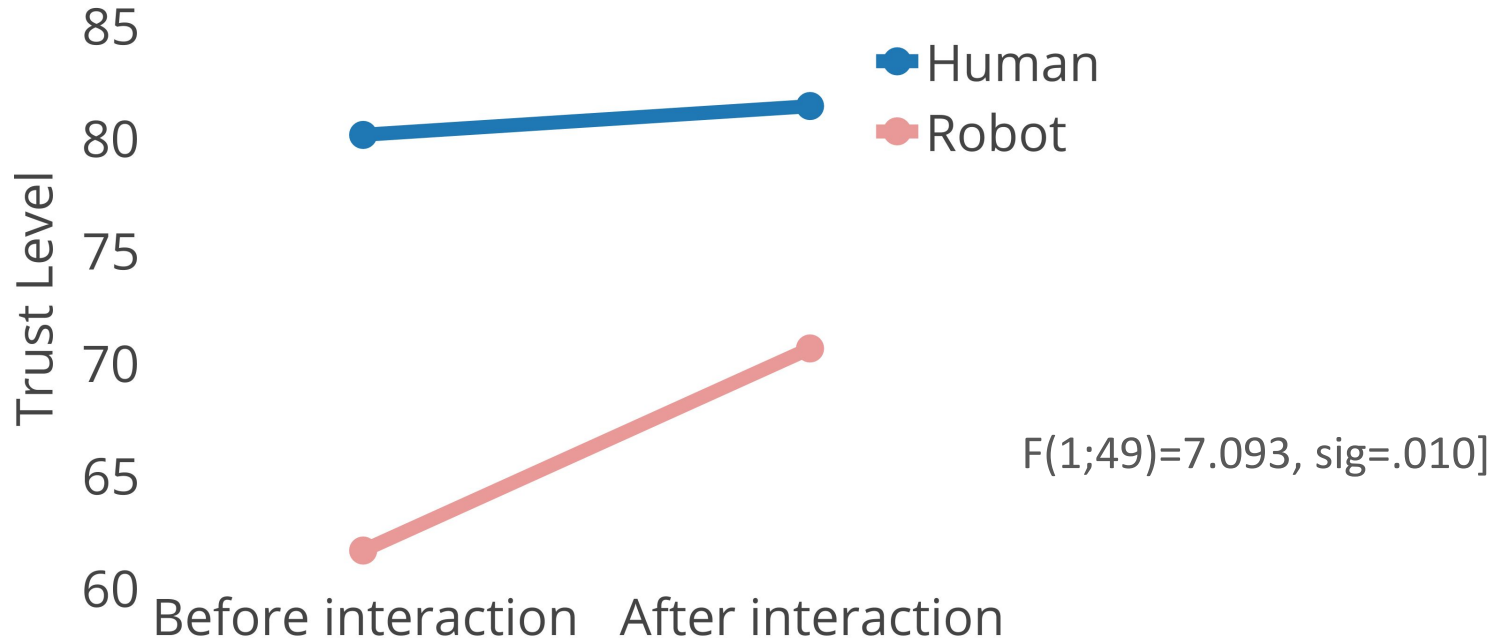
Trust results

Participants that did not know their partners before the game

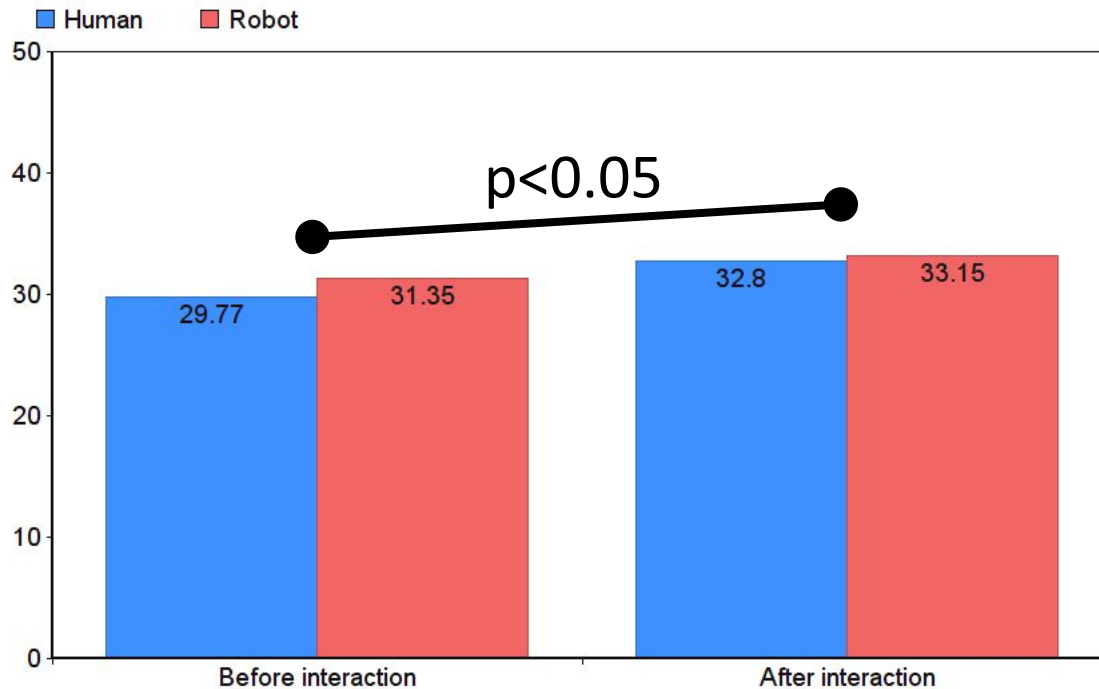


Trust results

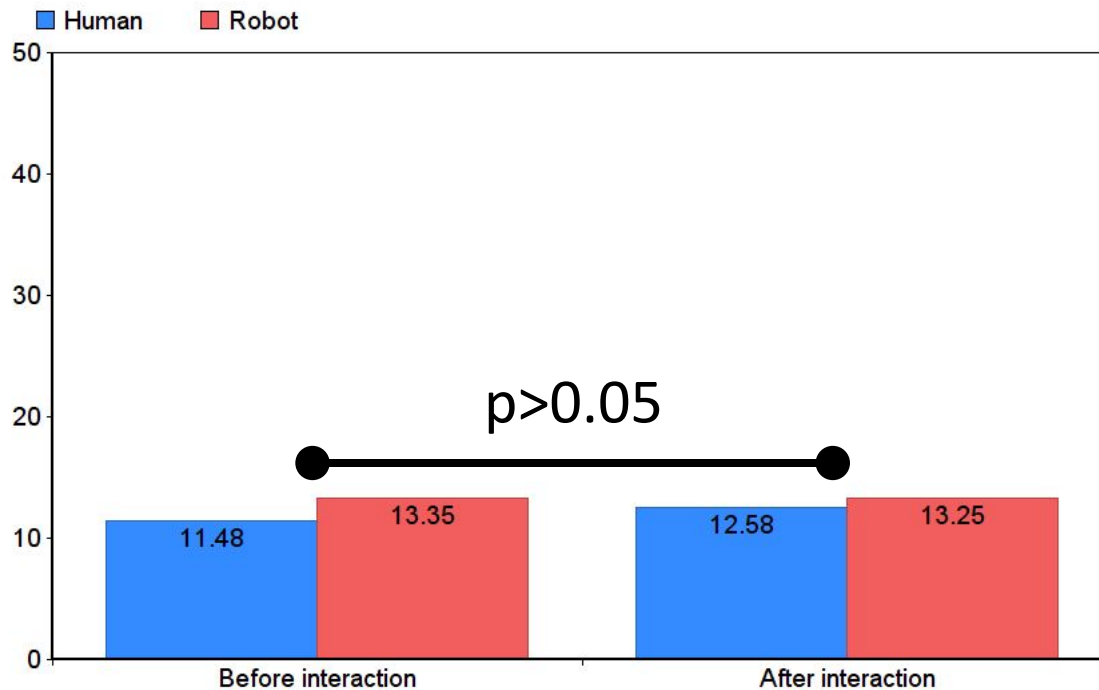
Participants that already knew their partners before the game



Positive Affect Results



Negative Affect Results



Sueca Tournament

- Sueca Tournament
- Uncontrolled environment
- Expert users during the tournament

(2) Sueca Tournament

15 subjects played 13 games with EMYS (~2 hours)



(2) Sueca Tournament

Questionnaire:

- EMYS played well
- Without mistakes
- Although with some differences...

(2) Sueca Tournament

Sueca champions did not want to play with EMYS...

...“not willing to lose their reputation by losing with a robot”.

Conclusions

- Humans trust a robot as a partner, but the trust level varies according to their previous knowledge of the same robot
- The development of trust towards robots may need longer interactions
- The scenario meet some of the needs of the elderly population related with social isolation and, **the next step is to test with older adults!**

Thank you!

Questions?

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