Robotic Multi-user Legibility

This questionnaire intends to assess the expressiveness of a robot, through movement, in an interaction with multiple people.

In order to evaluate, you will observe videos of four different movements of a robot moving to grab a cup. Each cup has a different color, to make it easily distinguible. After each video, you will have to predict which cup the robot is going to grab.

In this questionnaire we will not ask or record any information such as your name or address and to your answers we will atribute a number so as to anonymize your questionnaire. We will, however ask you some demographic questions such as age and the country you live in.

Before starting, in the name of the research team, I would like to thank you for the time spent answering to this questionnaire and help in our study.

*Obrigatório

1. **Do you allow the use of your answers for academic purposes? ***
   Marcar apenas uma oval.

   ◯ Yes

   ◯ No   *Passe para "Thank you for your collaboration!!."*

Demographic Information

This section serves to collect some background information regarding the participants that take this survey. This information is important for the research team to be able to frame the population that take this questionnaire and understand if the results are representative of the population in general.

The information collected in this section may also be used by the research team to draw patterns between different backgrounds and interaction with robots.

2. **What is your age? ***

   _____

3. **What country do you live in? ***

   _____

4. **What is your work occupation? ***
   Marcar apenas uma oval.

   ◯ Student

   ◯ Student-Worker

   ◯ Independant worker

   ◯ Employee

   ◯ Other

5. **What is your educational degree?** *

Marcar apenas uma oval.

- ⬭ High School
- ⬭ Bachelors
- ⬭ Masters
- ⬭ Doctorate
- ⬭ Other

First Robot Movement

You will now watch the first set of three small videos. These show the same movement for a robot, moving to grab one of the cups in the image. After, you will see the complete movement to know which cup the robot grasped.

Each video will be of different lengths and at the end of each you will have to predict which of the cups the robot is going to grab.

The aim of this study is to evaluate how well a robot can communicate through movement, so feel free to change you prediction from video to video.

Remember that there are no right or wrong answers, we are evaluating your perception of the movement to develop the communication skills of a robot.

Secção sem título

First five seconds of the movement
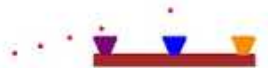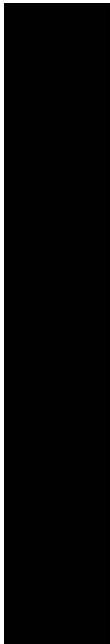
http://youtube.com/watch?v=AgKFmWpGxgQ

6. **Choose which is the cup the robot is going to grab** *

Marcar apenas uma oval.

- ⬭ Purple
- ⬭ Blue
- ⬭ Orange

7. **What was the reason behind you choice?** *

_____

8. **Rate how confident you are on your choice** *
Marcar apenas uma oval.

	1	2	3	4	5	6	7	8	9	10	
Serious doubts	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	No doubt

First ten seconds of the movement

[http://youtube.com/watch?](http://youtube.com/watch?v=Pjww1VeTTJ4) [v=Pjww1VeTTJ4](http://youtube.com/watch?v=Pjww1VeTTJ4)

9. **Choose which is the cup the robot is going to grab** *
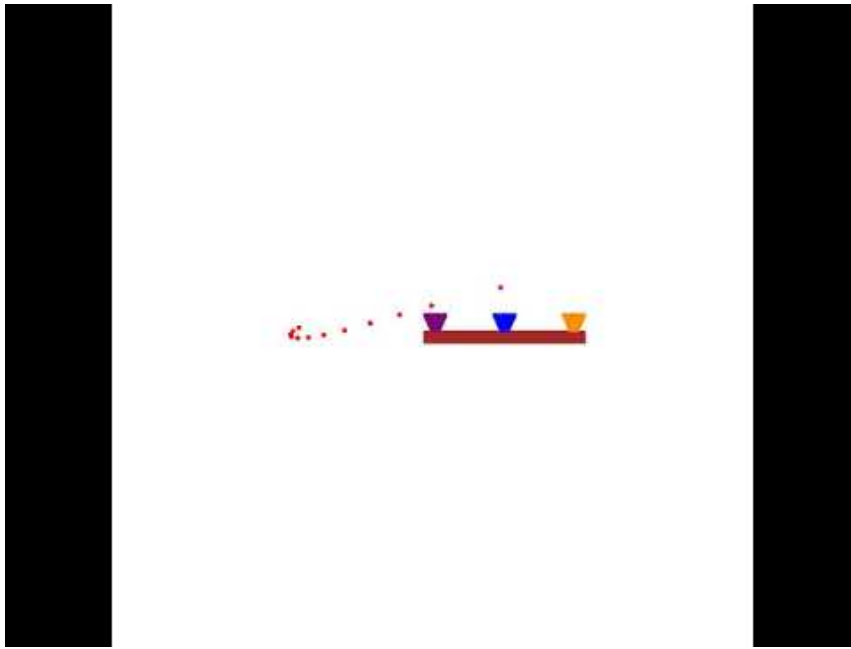*Marcar apenas uma oval.*

⬭ Purple

⬭ Blue

⬭ Orange

10. **What was the reason behind you choice?** *

_____

11. **Rate how confident you are on your choice** *
Marcar apenas uma oval.

	1	2	3	4	5	6	7	8	9	10	
Serious doubts	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	No doubt

First fifteen seconds of the movement

http://youtube.com/watch?v=E2ymmAPu1ow

12. **Choose which is the cup the robot is going to grab** *
    Marcar apenas uma oval.

    ⬭ Purple

    ⬭ Blue

    ⬭ Orange

13. **What was the reason behind you choice?** *

    _____

14. **Rate how confident you are on your choice** *
    Marcar apenas uma oval.

	1	2	3	4	5	6	7	8	9	10	
Serious doubts	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	No doubt

Complete movement to grab the Purple cup

Second Robot Movement

You will now watch the second movement to grab one of the cups. This is a different movement than before, so there are no guarantees that the target of the movement is the same as before.

Again, feel free to change you prediction from video to video, if you believe that with more of the movement seen you think the target is another.

Remember that there are no right or wrong answers, we are evaluating your perception of the movement to develop the communication skills of a robot.

Secção sem título

First five seconds of the movement
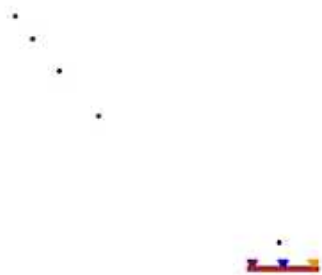
15. Choose which is the cup the robot is going to grab *

Marcar apenas uma oval.

( ) Purple

( ) Blue

( ) Orange

16. What was the reason behind you choice? *

_____

17. Rate how confident you are on your choice *

Marcar apenas uma oval.

	1	2	3	4	5	6	7	8	9	10	
Serious doubts	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	No doubt

First ten seconds of the movement

http://youtube.com/watch? [v=HTTFbnXrRAk](http://youtube.com/watch?v=HTTFbnXrRAk)

18. Choose which is the cup the robot is going to grab *

Marcar apenas uma oval.
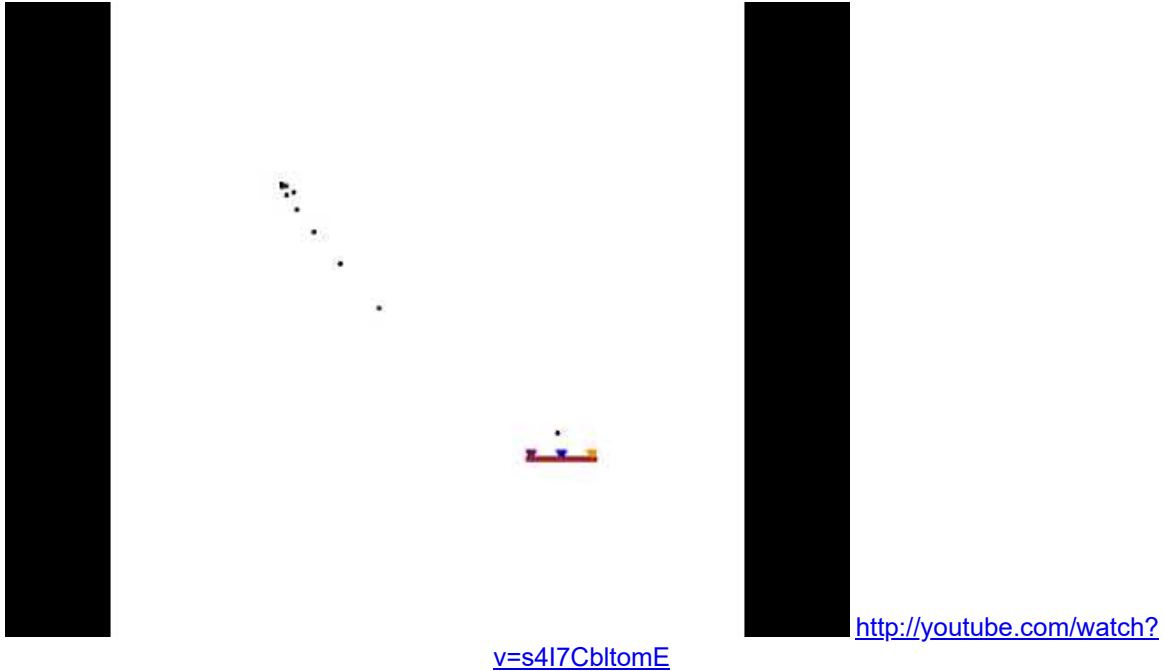
( ) Purple

( ) Blue

( ) Orange

19. What was the reason behind you choice? *

_____

20. **Rate how confident you are on your choice** *
Marcar apenas uma oval.

	1	2	3	4	5	6	7	8	9	10	
Serious doubts	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	No doubt

First fifteen seconds of the movement

http://youtube.com/watch?v=s4I7CbItomE

21. **Choose which is the cup the robot is going to grab** *
Marcar apenas uma oval.

◯ Purple

◯ Blue

◯ Orange

22. **What was the reason behind you choice?** *

_____

23. **Rate how confident you are on your choice** *
Marcar apenas uma oval.

	1	2	3	4	5	6	7	8	9	10	
Serious doubts	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	No doubt

Complete movement to grab the Purple cup

Third Robot Movement

You will now watch the third movement. This is a different movement than before, so there are no guarantees that the target of the movement is the same as before.

Again, feel free to change you prediction from video to video, if you believe that with more of the movement seen you think the target is another.

Remember that there are no right or wrong answers, we are evaluating your perception of the movement to develop the communication skills of a robot.

Secção sem título

First five seconds of the movement
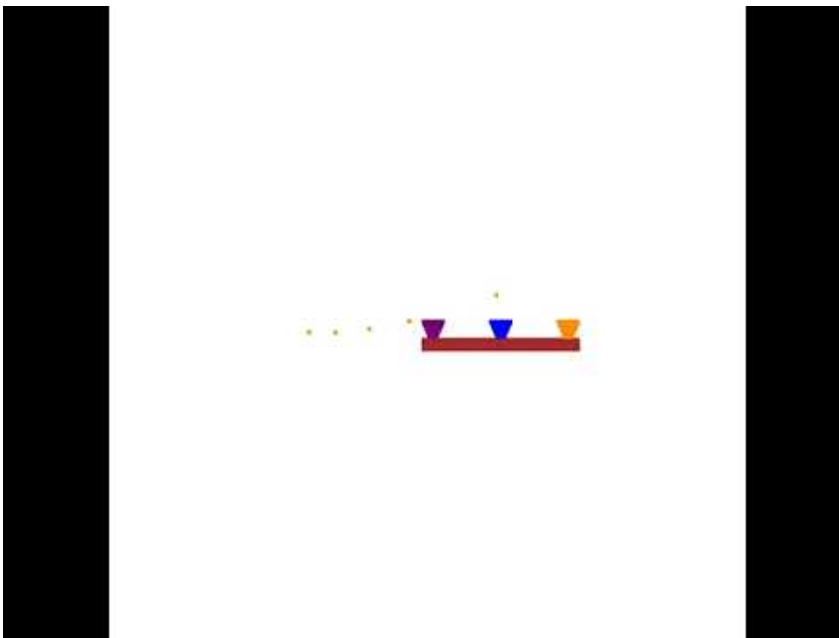
24. Choose which is the cup the robot is going to grab *

Marcar apenas uma oval.

( ) Purple

( ) Blue

( ) Orange

25. What was the reason behind you choice? *

_____

26. Rate how confident you are on your choice *

Marcar apenas uma oval.

	1	2	3	4	5	6	7	8	9	10	
Serious doubts	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	No doubt

First ten seconds of the movement

http://youtube.com/watch? [v=pWrrjF4bqww](http://youtube.com/watch?v=pWrrjF4bqww)

27. Choose which is the cup the robot is going to grab *

Marcar apenas uma oval.

( ) Purple

( ) Blue

( ) Orange

28. What was the reason behind you choice? *

_____

29. Rate how confident you are on your choice *

Marcar apenas uma oval.

	1	2	3	4	5	6	7	8	9	10	
Serious doubts	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	No doubt

First fifteen seconds of the movement

http://youtube.com/watch? [v=0MkVt9t_z_U](http://youtube.com/watch?v=0MkVt9t_z_U)

30. Choose which is the cup the robot is going to grab *

Marcar apenas uma oval.

- ⬭ Purple
- ⬭ Blue
- ⬭ Orange

31. What was the reason behind you choice? *

_____

32. Rate how confident you are on your choice *

Marcar apenas uma oval.

	1	2	3	4	5	6	7	8	9	10	
Serious doubts	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	No doubt

Complete movement to grab the Purple cup

http://youtube.com/watch?v=_EDCIv2D6DA

Fourth Robot Movement

You will now watch the fourth and last movement. This is a different movement than before, so there are no guarantees that the target of the movement is the same as before.

Again, feel free to change you prediction from video to video, if you believe that with more of the movement seen you think the target is another.

Remember that there are no right or wrong answers, we are evaluating your perception of the movement to develop the communication skills of a robot.

Secção sem título

First five seconds of the movement

http://youtube.com/watch?v=n7H_N9NUj5Q

33. Choose which is the cup the robot is going to grab *

Marcar apenas uma oval.

( ) Purple

( ) Blue

( ) Orange

34. What was the reason behind you choice? *

_____

35. Rate how confident you are on your choice *

Marcar apenas uma oval.

	1	2	3	4	5	6	7	8	9	10	
Serious doubts	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )	No doubt

First ten seconds of the movement

http://youtube.com/watch?v=LxleI7UNO40

36. Choose which is the cup the robot is going to grab *

Marcar apenas uma oval.
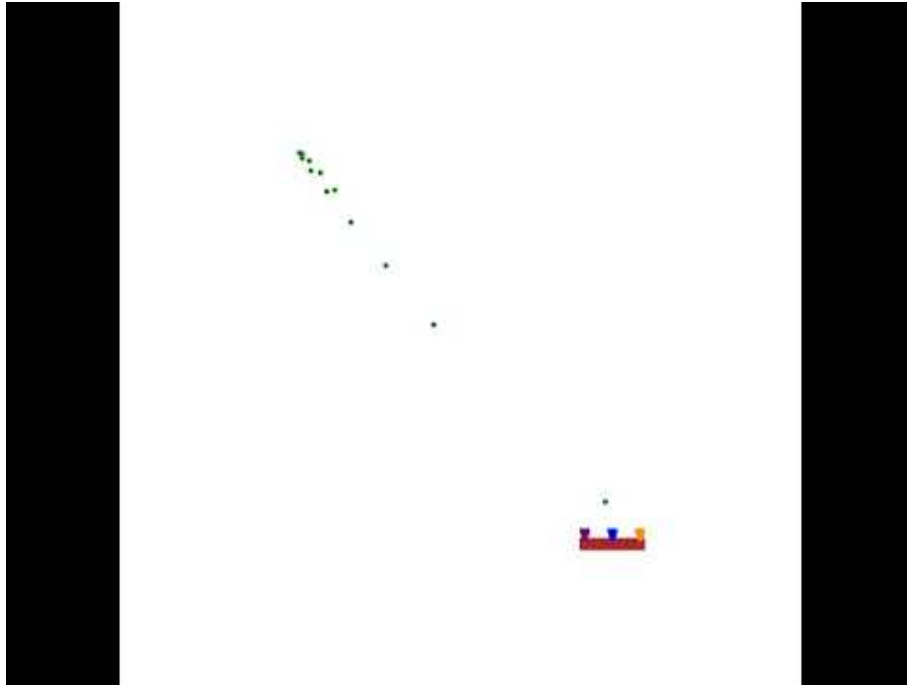
( ) Purple

( ) Blue

( ) Orange

37. What was the reason behind you choice? *

_____

38. **Rate how confident you are on your choice** *
Marcar apenas uma oval.

	1	2	3	4	5	6	7	8	9	10	
Serious doubts	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	No doubt

First fifteen seconds of the movement

http://youtube.com/watch?v=z5D1jj0Tg94

39. **Choose which is the cup the robot is going to grab** *
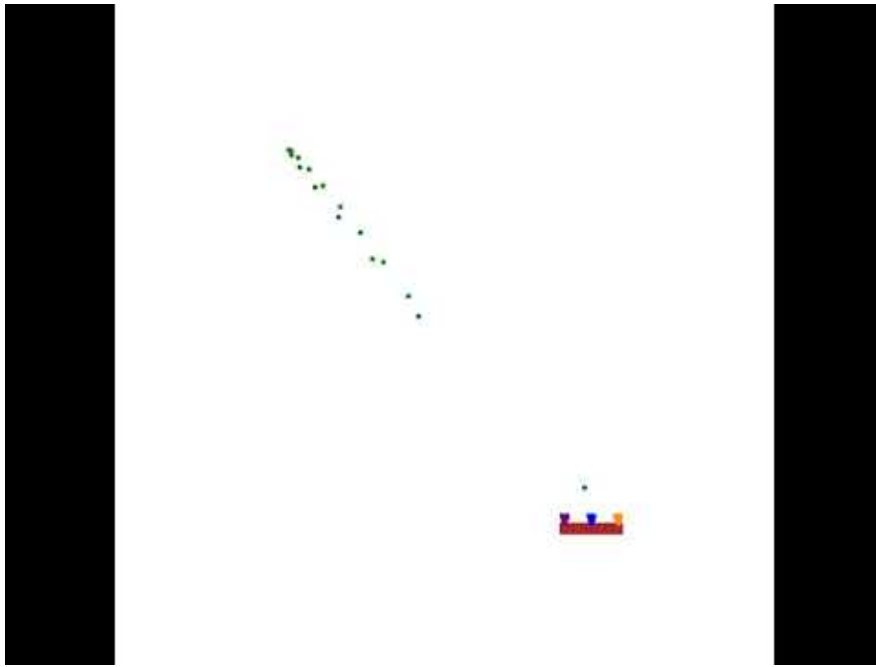*Marcar apenas uma oval.*

◯ Purple
◯ Blue
◯ Orange

40. **What was the reason behind you choice?** *

_____

41. **Rate how confident you are on your choice** *
Marcar apenas uma oval.

	1	2	3	4	5	6	7	8	9	10	
Serious doubts	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	No doubt

Complete movement to grab the Purple cup

http://youtube.com/watch?v=fAxnYLJXRmo

Movement Comparison

Now that you watched the four different movements, we ask you to compare them by answering the following questions.

Remember there are no right or wrong answers.

42. **Which movement made the robot's intention clearer?** *

Marcar apenas uma oval.

- ( ) Red movement
- ( ) Black movement
- ( ) Yellow/Gold movement
- ( ) Green movement

43. **Which movement do you prefer to interact with?** *

Marcar apenas uma oval.

- ( ) Red movement
- ( ) Black movement
- ( ) Yellow/Gold movement
- ( ) Green movement

44. **Which movement was easier?** *

Marcar apenas uma oval.

- ( ) Red movement
- ( ) Black movement
- ( ) Yellow/Gold movement
- ( ) Green movement

45. **Which movement were you more confident in rating?** *

Marcar apenas uma oval.

- ◯ Red movement
- ◯ Black movement
- ◯ Yellow/Gold movement
- ◯ Green movement

Thank you for your collaboration!!

We thank you for collaborating in this study.

Any questions you might have regarding this study, please contact miguel.faria@tecnico.ulisboa.pt

Com tecnologia

Google Forms