

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 one object. The objects the robot may grab are on a table and are: a soda can, a rubber duck and a telephone. After each video, you will have to predict which object the robot is going to grab.

In this questionnaire we will not ask or record any personally identifiable information. We will attribute a number to your answers so as to anonymize your questionnaire. We will also ask you some demographic questions, namely your age, country of residence, occupation and education level.

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 *Avançar para a secção 12 (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.

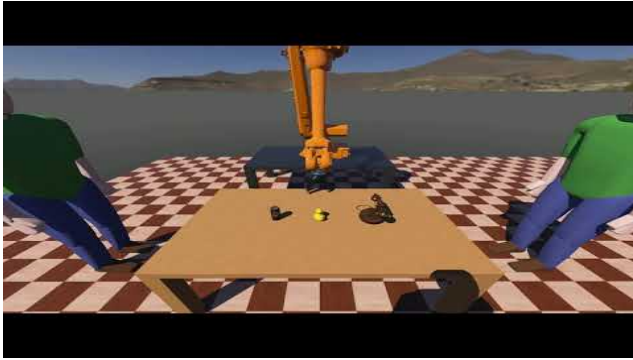
- ☐ High School
- ☐ Bachelors
- ☐ Masters
- ☐ Doctorate
- ☐ Other

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 three objects in the image - soda can, rubber duck and telephone. After, you will see the complete movement to know which object the robot grasped.

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

The following video shows an example movement like the ones shown in the questionnaire videos.



http://youtube.com/watch?v=Q7Gi_hyVyMo

The aim of this study is to evaluate how well a robot can communicate through movement, so feel free to change your 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 six seconds of the movement



<http://youtube.com/watch?v=oMutF0KknC4>

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

Marcar apenas uma oval.

- ☐ Soda Can
- ☐ Rubber Duck
- ☐ Telephone

7. What was the reason behind your 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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No doubt

First twelve seconds of the movement



<http://youtube.com/watch?v=F9Di4-it1iM>

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

Marcar apenas uma oval.

- ☐ Soda Can
- ☐ Rubber Duck
- ☐ Telephone

10. What was the reason behind your 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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No doubt

First eighteen seconds of the movement



<http://youtube.com/watch?v=i4g85Kq5Pf4>

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

Marcar apenas uma oval.

- ☐ Soda Can
- ☐ Rubber Duck
- ☐ Telephone

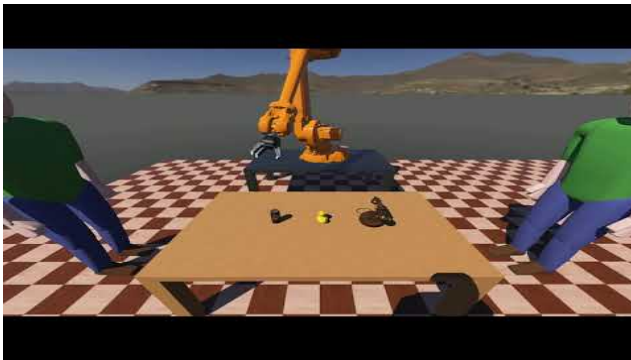
13. What was the reason behind your choice? *

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No doubt

Complete movement


<http://youtube.com/watch?v=VOevEkuDa-l>

Second Robot Movement

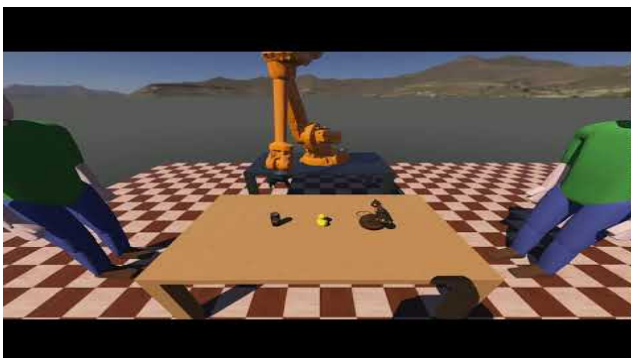
You will now watch the second movement to grab one of the cups. This is a different movement than before, so there are no guarantees that the target of the movement is the same as before.

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 six seconds of the movement


<http://youtube.com/watch?v=0Ui6SdZoeWM>

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

Marcar apenas uma oval.

- ☐ Soda Can
- ☐ Rubber Duck
- ☐ Telephone

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No doubt

First twelve seconds of the movement



<http://youtube.com/watch?v=WqH7LJPJL6g>

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

Marcar apenas uma oval.

- ☐ Soda Can
- ☐ Rubber Duck
- ☐ Telephone

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No doubt

First eighteen seconds of the movement



<http://youtube.com/watch?v=6xiXjd9zBuQ>

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

Marcar apenas uma oval.

- ☐ Soda Can
- ☐ Rubber Duck
- ☐ Telephone

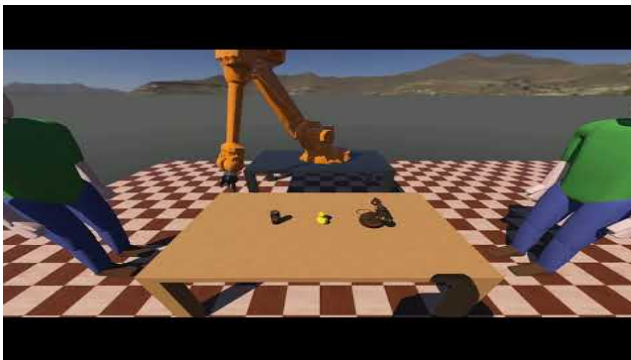
22. What was the reason behind you choice? *

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No doubt

Complete movement



http://youtube.com/watch?v=ri_LOA7KVDI

Third Robot Movement

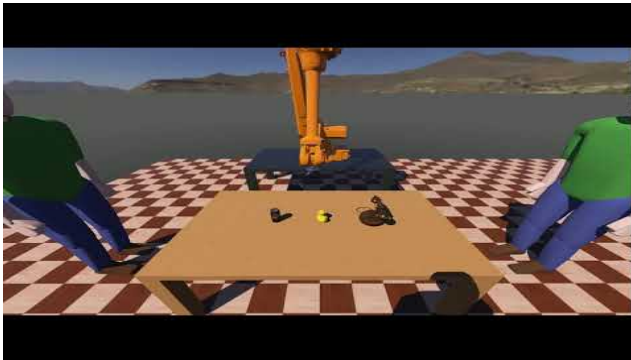
You will now watch the third movement. This is a different movement than before, so there are no guarantees that the target of the movement is the same as before.

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 six seconds of the movement



<http://youtube.com/watch?v=MTkT2fI0EQ!>

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

Marcar apenas uma oval.

- ☐ Soda Can
- ☐ Rubber Duck
- ☐ Telephone

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No doubt

First twelve seconds of the movement



<http://youtube.com/watch?v=vkXzueRe4ml>

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

Marcar apenas uma oval.

- ☐ Soda Can
- ☐ Rubber Duck
- ☐ Telephone

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No doubt

First eighteen seconds of the movement



<http://youtube.com/watch?v=iM9yF-B07LA>

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

Marcar apenas uma oval.

- ☐ Soda Can
- ☐ Rubber Duck
- ☐ Telephone

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No doubt

Complete movement


<http://youtube.com/watch?v=MbxA-OSjVEk>

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 six seconds of the movement


<http://youtube.com/watch?v=BgVxIhLNM6o>

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

Marcar apenas uma oval.

- ☐ Soda Can
- ☐ Rubber Duck
- ☐ Telephone

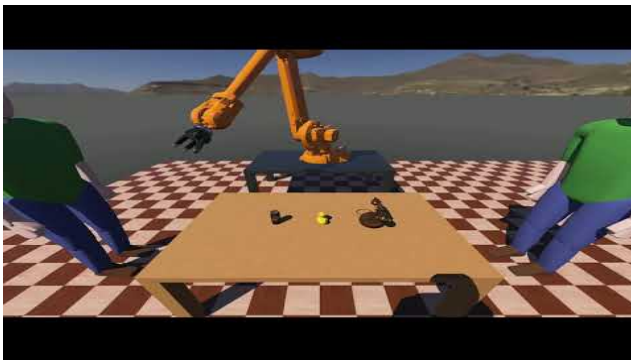
34. What was the reason behind you choice? *

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No doubt

First twelve seconds of the movement



<http://youtube.com/watch?v=VB5z6WCImZg>

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

Marcar apenas uma oval.

- ☐ Soda Can
- ☐ Rubber Duck
- ☐ Telephone

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No doubt

First eighteen seconds of the movement



<http://youtube.com/watch?v=gNkGMdggIf0>

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

Marcar apenas uma oval.

- ☐ Soda Can
- ☐ Rubber Duck
- ☐ Telephone

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	No doubt

Complete movement



<http://youtube.com/watch?v=MbxA-OSjVEk>

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.



☐ Movement 1



☐ Movement 2



☐ Movement 3



☐ Movement 4

43. Which movement was easier? *

Marcar apenas uma oval.



☐ Movement 1



☐ Movement 2



☐ Movement 3



☐ Movement 4

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

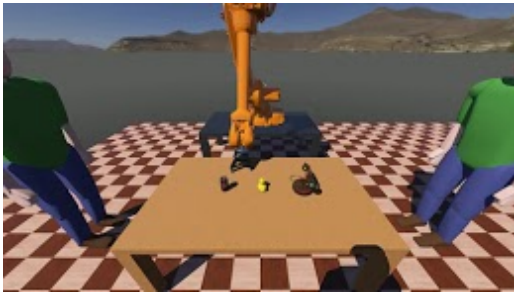
Marcar apenas uma oval.



☐ Movement 1



☐ Movement 2



☐ Movement 3



☐ Movement 4

Thank you for your
collaboration!!

We thank you for collaborating in this study.

Any questions you might have regarding this study, please contact
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