Participant Information Sheet

Appropriate Robot Reaction to Error Situation in Human-Robot Collaboration Online User Study

You are invited to take part in research taking place online. It is funded by EPSRC through the FARSCOPE Centre for Doctoral Training. Before you decide whether to take part, it is important for you to understand why the study is being done and what it will involve. Please read the following information carefully. If you have any queries or would like more information please contact Dito Eka Cahya, Faculty of FET, the University of the West of England, Bristol ([Dito2.Cahya@live.uwe.ac.uk](mailto:Dito2.Cahya@live.uwe.ac.uk)).

# Who is organising and funding the research?

The project lead is Dito Eka Cahya, a PhD Student at the University of Bristol and the University of the West of England, Bristol, supervised by Prof. Manuel Giuliani.

# What is the aim of the research?

Collaborative robots are required to cooperate side by side with humans in an unstructured and dynamic environment. To achieve that goal, robots need to have technical skills such as the ability to monitor environmental conditions and dynamically plan their tasks to suit the collaboration condition. On top of that, robots need to possess social skills such as awareness of human intention and perform appropriate reactions to unprecedented situations. This study aims to investigate appropriate robot reactions to error situations during Human-Robot Collaboration. The result of this study will be analysed and utilised to develop an integrated software architecture for collaborative robots which can detect error situations and react appropriately to rectify the situations. The anonymised results may also be used in conference papers and peer-reviewed academic papers.

# Why have I been invited to take part?

As an adult above 18 to 65, we are interested in gaining information about your opinion on the likeability, perceived intelligence, and anthropomorphism of the robot based on the robot reaction to an error situation. Therefore, the study will ask you about these things. We will not be asking any questions that might identify you. The purpose of the questions is to find the most appropriate robot reaction to a particular error situation.

# Do I have to take part?

You do not have to take part in this research. It is up to you to decide whether or not you want to be involved. If you do decide to take part, you will be given a copy of this information sheet to keep and you will be asked to sign a consent form. If you do decide to take part, you can withdraw from the research without giving a reason until 3 (three) days from the date you signed your consent form. This cut-off allows us to minimise the possible impact of the removal of your data on the ongoing data analysis and write-up of the project. If you want to withdraw from the study within this period, please write to Dito Eka Cahya (Dito2.Cahya@live.uwe.ac.uk). Deciding not to take part or to withdraw from the study does not incur any penalty.

# What will happen to me if I take part and what do I have to do?

At the beginning of this study, you will be asked to fill in demographic and personality questionnaires. After that, you will be asked to watch six short videos of people collaborating with a robot in which the robot created different types of error situations. After each collaboration video, you will be shown a video of a robot reaction, handling the error situation. After each robot reaction, you will be asked to fill a subset of the Godspeed questionnaire which rate the likeability, perceived intelligence, and anthropomorphism of the robot based on the robot reaction. Your answers will be fully anonymised. The whole study will take around 30 minutes to complete.

# What are the benefits of taking part?

If you take part, you will be helping us to gain a better understanding of the appropriate robot reactions to error situations during Human-Robot Collaboration. We will also monetary compensate you with the UK’s minimum wage if you finished this online study with valid responses.

# What are the possible risks of taking part?

We do not foresee or anticipate any significant risk to you in taking part in this study. If, however, you feel uncomfortable at any time you can leave the online study without any penalty. If you need any support during or after the online study then the researchers will be able to put you in touch with suitable support agencies. The research team are experienced in conducting an online user study and are sensitive to the subject area. The online study has been designed with these considerations in mind.

# What will happen to your information?

All the information we receive from you will be treated in the strictest confidence.

The personal information collected in this research project will be processed by the University of the West of England Bristol following the terms and conditions of the 1998 Data Protection Act. We will hold your data securely and not make it available to any third party unless permitted or required to do so by law.

All the data will be stored under an anonymous identifier and used on a confidential basis. The recorded task data and the resulting analysed data will be held for as long as it retains research value although this is unlikely to exceed 10-years. The anonymised data may be made available for further appropriately approved research at the University, and we will ensure that there is no possibility of identification or re-identification.

# Where will the results of the research study be published?

A Report will be written containing our research findings. This Report will be available at the University of the West of England’s open-access Research Repository. The project funder is EPSRC through the FARSCOPE Centre for Doctoral Training.

A hard copy of the Report will be made available to all research participants if you would like to see it. Key findings will also be shared both within and outside the University of the West of England, such as in publications, academic journals and also presentations at academic conferences or teaching purposes by the researchers of this study and other researchers in the related field. All published data will be completely anonymised with no identifying information about individual participants.

# Who has ethically approved this research?

The project has been reviewed and approved by the University of the West of England University Research Ethics Committee with reference number FET.21.02.032. Any comments, questions or complaints about the ethical conduct of this study can be addressed to the Research Ethics Committee at the University of the West of England at: [Researchethics@uwe.ac.uk](mailto:Researchethics@uwe.ac.uk)

# What if something goes wrong?

If you have any concerns, queries and/or complaints regarding this research, please contact the researcher supervisor Prof. Manuel Giuliani (manuel.giuliani@uwe.ac.uk).

# What if I have more questions or do not understand something?

If you would like any further information about the research please contact in the first instance:

Dito Cahya (researcher): [dito2.cahya@live.uwe.ac.uk](mailto:dito2.cahya@live.uwe.ac.uk)

FARSCOPE Centre for Doctoral Training  
Bristol Robotics Laboratory, the University of the West of England  
T Block, Frenchay Campus, Coldharbour Lane, Bristol, BS16 1QY

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| Thank you for agreeing to take part in this study.  You will be given a copy of this Participant Information Sheet and your signed Consent Form to keep. |

V.1.1, Dito Eka Cahya, 6 May 2021