

FEASIBILITY STUDY INTO A ROBOT ASSISTED TIMED UP AND GO TEST

Recent research has shown that intelligent robotic technologies and sensors can provide services for independent living to older people through supporting and promoting an active and healthy lifestyle. Previous focus groups and interviews with older people and care professionals have highlighted the risks of sedentary lifestyles and the impacts these can have on frailty and fall risk. To address these challenges, we are developing a system for deployment on a robot using vision to conduct a Timed Up and Go (TUG) test which is a commonly used metric when evaluating a person's mobility. The system will analyse joint coordinates and angles to determine the person's performance during the test, with force sensors being used to measure weight distribution. The aim of this research is to explore the feasibility of a vision-based approach in performing TUG test and motion analysis to better support older people and care professionals in their daily lives.

Why have I been asked to participate?

We believe that the centre of this research should be the intended main users of this technology. Therefore, we are looking for participants aged between 18-75 years old who are able to complete the Timed Up and Go Test without physical assistance.

What will I be required to do?

The study involves a single session where you will be asked to complete the Timed Up and Go test three times with two different robots. The TUG test requires you to start from a seated position, stand up, walk forward 3 metres to a cone, turn around, walk back to the chair, and sit down. The first time will not be recorded and is to ensure you are familiar with the task, During the next two times, you will conduct the test with one of the two robots (a different robot each time). You will also be asked to wear sensors on your legs just above the ankles that detect your inertia and motion and are considered the gold standard when performing the TUG test. During the robot phases, you will be recorded by the vision system on the robot and your joint coordinates will be recorded and drawn on a blank canvas so you cannot be identified in the video.

The study will take place in the Advanced Wellbeing Research Centre in Olympic Park, Sheffield.

What are the possible benefits of taking part?

There will be no direct benefit to participants during the study, however the research may prove beneficial for people in the future to reduce risks of frailty and maintain active and healthy lifestyles.

Are there any possible risks or disadvantaged in taking part?

No. There are no risks involved with participating in this study. The data provided will be anonymised before being reported or shared with anyone outside of the research team and all relevant safety and data protection measures are in place.

What happens to the information I provide?

All data and demographic information will be kept anonymous and held confidentially in accordance with GDPR and the Data Protection Act 1998. This means that no personal identifiable information will be linked to the data, and only the study coordinators will have access to password protected participant data. The University undertakes research as part of its function for the community under its legal status. Data protection allows us to use personal data for research with appropriate safeguards in place under the legal basis of **public tasks that are in the public interest**. A full statement of your rights can be found at: www.shu.ac.uk/about-this-website/privacy-policy/privacy-notice-for-research. However, all University research is reviewed to ensure that participants are treated appropriately and their rights respected. This study was approved by the University's Research Ethics Committee with reference number **ER60410080**. Further information at: www.shu.ac.uk/research/excellence/ethics-and-integrity.

If you do decide to take part, you will be asked to complete a consent form prior to the focus group discussion. Your name will not be used in any way when the results of this research are published. You will create a unique identifier that we will use to combine the research data from the individual parts of the study.

As per the University retention schedule, anonymised research data will be retained for a period of 10 years. The data provided by you during the study will be used to assess the feasibility of the system through quantitative analysis and the interview responses will undergo thematic analysis. The data and your responses will be anonymized and used for publication of the research. Should you wish to find out about the results of the study you can contact one of the lead researchers who will notify you.

What if I want to withdraw?

It is up to you to decide if you want to take part. A copy of the information provided here is yours to keep, along with the consent form if you do decide to take part. You can still decide to withdraw until a week after the day of your participation without giving a reason, or you can decide not to answer a particular question. After a week of your participation, the data will be anonymised and it will not be possible to identify your data.

If you wish to ask any further questions about the study, please feel free to contact the lead researchers.

Researcher/ Research Team Details:

Lead Researcher 1:

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You should contact the Data Protection Officer if:

- you have a query about how your data is used by the University
- you would like to report a data security breach (e.g. if you think your personal data has been lost or disclosed inappropriately)
- you would like to complain about how the University has used your personal data

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You should contact the Head of Research Ethics (Dr Mayur Ranchordas) if:

- you have concerns with how the research was undertaken or how you were treated

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