Study Activities

PRIME-VR2 at UCL: Accessible Virtual Reality for People with Hyperkinetic Movement Disorders

Are your hands or arms affected by dystonia or a hyperkinetic movement disorder? Please get in touch to help us with our virtual reality research project.

PRIME-VR2 is a research project that is creating accessible virtual reality (VR) games and technology for disabled people, to provide a safe and motivating environment in which people can learn and practice movement. We will be creating motivating VR games and accessible controllers for people with a range of disabilities.

At University College London and the Global Disability Innovation Hub we are working on the first part of this project to create virtual reality controllers that can be used by people with hyperkinetic movement disorders (like dystonia) to control their interactions in a virtual reality game. It is important that we start with the right foundation for the design of the controllers, so we want to work with people with dystonia to understand your thoughts on virtual reality and what kinds of environments would be useful for developing improved functioning. We also need to take some measurements to help us design the physical aspects of the controller, such as its shape and how you interact with it. Should it have buttons? How firm should they be?

We will aim to capture the information we need in two parts; the first will be conducted remotely through Microsoft teams, which will consist of an interview and a recording session via the participant's web camera, that will take about one to two hours. The second session will be face to face[1] and will involve further more detailed recording of movements using video and sensors and a 3D scan of the participant's arms.

There will be a variety of activities undertaken during the sessions and breaks will be provided whenever they are needed, please see the breakdown below:

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[1] *To be completed once face to face contact is possible*

Initial remote session:

(a) An **interview about your disability, activities** and your **objectives for participating** in this project [30 minutes]. The information will help us understand what is important to you and guide the design of the VR games so that they are relevant and interesting to you. We will talk about:

- **What activities are important to** you - this is so that we can choose the right activities for the games we are designing;
- **What is the purpose of the activities -** so we can set the right objectives for the games we design;
- **Who you do them with, and how you do them together -** this will help us understand how to design our games so that people can play them together.
- **What movements you use when you engage in these activities-** to help us design the right movements into the games;

(b) Measurement of the **forces you can apply with your fingers and hands** with simple hand-held force meters (dynamometers) [10 minutes]. We will not ask you to do anything that causes discomfort;

(c) Measurement of **how you move your arms and hands** when you are doing a simple task, using a **video camera** [10 minutes].

(d) Observation and video recording of **how you choose to interact** with some sample shapes that might be used for the controller [10 minutes].

Face to face session:

(e) Taking calibrated photographs of your hands and arms to enable us to measure their dimensions [10 minutes];

(f) Measurement of **how you move your arms and hands** when you are doing a simple task using **lightweight wearable motion sensors** and a **video camera** [10 minutes].

(g) **3D scanning of your arms with a hand-held 3D scanner.** We will position your hand and arm, and then scan it to inform the designers of the shape of your hands and arms. We will not scan your face or head. You will not be able to be identified from the scan data. We would like you to try to keep still for the scan, but we understand that this may be difficult for you. [up to 30 minutes – this is new work. We do not currently know exactly how long this will take]

There will be opportunities for participating in the project for three years after this initial stage, including testing prototype VR controllers and games. We want to find out what works.

If you are interested, and to find out more, please contact Richard Armstrong-Wood at the UCL Global Disability Innovation Hub (part of the Computer Science department).

Email: Richard.Armstrong-Wood.17@ucl.ac.uk
http://prime-vr2.eu | http://www.disabilityinnovation.com

Sessions will be held online using UCL approved Microsoft Teams. We will pay £20 per person for the remote session work (a-d) and a further £10 person for the face to face session (e-g) on completion of your participation to compensate you for your time. The full amount will be paid even in the event of early withdrawal.