

CONSENT FORM

Effective Multi-User Interaction and Collaboration in Virtual Reality

You are invited to be in a research study of investigating novel human-computer interface mechanisms that improve how people interact and collaborate with each other in multi-user, networked 3D virtual environments. You were selected as a possible participant because you responded to an email or flyer on the University of Minnesota Duluth campus. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by: Dr. Peter Willemsen, Department of Computer Science, Swenson College of Science and Engineering, University of Minnesota Duluth, 331 Heller Hal, Phone: (218) 726-6228, Email: willemsn@d.umn.edu

Background Information

The purpose of this project is to investigate novel human-computer interface mechanisms that improve how people interact and collaborate with each other in multi-user, networked 3D virtual environments. In a virtual environment (or virtual reality) experience a person is provided with visual feedback using a head-mounted display device (such as an Oculus Rift or HTC Vive or Microsoft HoloLens) that they wear on their head. These devices provide simulated views for a person to give them an immersive, interactive sensation of being within a virtual space.

Collaborative, shared virtual experiences will increasingly be utilized to train and educate people as commodity virtual reality hardware makes its way to the public. Moreover, these types of systems will increasingly be used to extend and facilitate social interaction. This research aims to improve human-computer interfaces in such future systems.

Procedures:

If you agree to participate in this research study, you will be asked to interact with a computer program to manipulate positions or orientations of objects or even modify a set of virtual menus. Our goal is to develop interfaces to computers that are more natural and more effective for human-computer interaction and specifically improve human collaboration and communication within collaborative virtual reality systems. A collaborative virtual reality system is one within which multiple users interact with each in a shared, virtual setting using head-mounted display technology like that now available with Oculus Rift, HTC Vive or Microsoft HoloLens display systems. Depending on the condition in which you participate, you may be placed in front of a computer screen, or a computer projected image on a wall or table, or within an immersive virtual environment, or virtual reality, using a head-mounted display. A head-mounted display is a goggle-like device that provides you with a sense of 3-dimensional visual depth, or stereo vision, while you view a virtual environment. We may also have you wear gloves that contains small sensors that can tell us where your hands are and how they are oriented in space. We will use this information to help you interact with our computer programs.

Once the experiment starts, you will be asked to perform simple tasks that either (1) change your location within the virtual environment in which you are placed, or (2) manipulate the objects you see in the virtual environment. The way in which you make these changes and how your body, hand or foot motion is mapped to these changes in the virtual scene will be varied and is the focus of this study. In all cases, you will be trained prior to the experiment on the specifics of how you will interact with the computer program. The interaction ranges from mouse/keyboard interaction to using hand gestures. In the head-mounted display condition, you may also be asked to walk around the lab while being tethered to a display backpack either worn by yourself or by one of the researchers involved with the study. In all conditions, researchers will be standing next to you to provide a sense of safety in case you have any questions or concerns about the experiment.

Risks and Benefits of being in the Study

The study has risks associated with viewing images on a computer display and using virtual reality equipment to provide an immersive display environment. First, there is a slight risk that you will become bored or frustrated by the nature of the interaction or the task. Second, there is a risk of headache, nausea, eyestrain, and fatigue associated with viewing images on computer displays. The risk is not more than would be encountered under normal computer usage or especially under normal video game playing situations. Third, there is a risk that while using the head-mounted display, you may experience motion sickness, nausea, headache, fainting, or lose balance. These risks are minimal but can occur due to how you perceive the dynamic motion and simulated stereo imagery displayed in the head-mounted display. You will routinely be asked how you are feeling. If you feel any of the symptoms listed above, or become uncomfortable with wearing the head-mounted display please let the researcher know. The experiment will be stopped and you will be given time to sit down and rest until you are feeling better. You may end participation in the study without consequence. Finally, if you have a history of motion sickness you should refrain from participating in this research study due to the potential risks of motion sickness. In all experimental conditions involving the head-mounted displays, the principal investigator or another study team member will be standing next to you to monitor the risks mentioned with study participation.

There are no direct benefits for participating in this study.

Compensation:

There is no compensation in this experiment. Your participation in it is completely voluntary.

Confidentiality:

The records of this study will be kept private. In any report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records. Study data will be encrypted according to current University policy for protection of confidentiality.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota or with the Department of Computer Science at the University of Minnesota Duluth. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions:

The researchers conducting this study are: Dr. Peter Willemsen and Cody Seavey. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact them at Heller Hall 321 on the Duluth Campus, 218-726-6228, willemsn@d.umn.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

You will be given a copy of this information to keep for your records, if you would like one.

Statement of Consent:

I have read the above information. I have asked questions and have received answers. I consent to participate in the study. *[Avoid statements that begin with "I understand...".]*

Signature: _____ Date: _____

Signature of Investigator: _____ Date: _____