

## Consent Form

### Title of Research Study: Effective Learning in Virtual Reality Environments [HRP-580]

#### Investigator Team Contact Information:

For questions about research appointments, the research study, research results, or other concerns, call the study team at:

Investigator Name: Pete Willemsen Investigator Departmental Affiliation: Department of Computer Science Heller Hall 320, University of MN Duluth Phone Number: (218) 726-6228 Email Address: willemsn@d.umn.edu	Student Investigator Name: Christianah Adigun Email Address: adigu002@d.umn.edu
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### ***Key Information About This Research Study***

The following is a short summary to help you decide whether or not to be a part of this research study. More detailed information is listed later on in this form.

The purpose of this project is to investigate novel human-computer interface mechanisms that improve how people interact with and obtain information in 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 are goggle-like devices that provide a sense of 3-dimensional depth, or stereo vision. With these devices, we can give a person an immersive, interactive sensation of being within a virtual space. In these environments, you may use virtual reality joysticks, or interface controllers, to let you use your hands to interact with the space.

If you agree to participate in this research study, you will be asked to interact with a computer program to explore a virtual reality environment. In this environment you will be tasked with moving around and reading information contained in the virtual environment. Our goal is to develop interfaces to computers that are more natural and more effective for human-computer interaction and specifically may improve human interaction within virtual reality systems. You will be trained how to use all virtual reality devices.

The study has minimal potential risks associated with viewing images on a computer display and using virtual reality equipment to provide an immersive display environment. There is a slight risk that you will become bored or frustrated by the nature of the interaction or the task. 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. There is also a risk that while using the head-mounted display, you may experience motion sickness, nausea, headache, feeling faint, or lose balance. These risks are minimal and are not likely more than what might occur while watching a 3D movie, but can occur due to how you perceive the dynamic motion and simulated stereo imagery displayed in the head-mounted display. We have created our experiment to minimize these risks for you. During the experiment, you will be routinely 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

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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. In all experimental conditions involving virtual or augmented reality, a study team member will be standing near you to monitor the risks mentioned with study participation.

### What is research?

- The goal of research is to learn new things in order to help people in the future. Investigators learn things by following the same plan with a number of participants, so they do not usually make changes to the plan for individual research participants. You, as an individual, may or may not be helped by volunteering for a research study.

### Why am I being invited to take part in this research study?

We are asking you to take part in this research study because we are soliciting participation in the experiment amongst people 18-75 years old. You were selected as a possible participant because you responded to an email, flyer or other communication from 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.

You are eligible to participate in this experiment if you have normal, or corrected to normal vision (with glasses or contacts) and feel comfortable wearing virtual reality equipment. You will need to be able to move around the lab space while wearing the virtual reality equipment. Finally, if you have a history of experiencing motion sickness you should refrain from participating in this research study due to the potential risks related to motion sickness.

### What should I know about a research study?

- Someone will explain this research study to you.
- Whether or not you take part is up to you.
- You can choose not to take part.
- You can agree to take part and later change your mind.
- Your decision will not be held against you.
- You can ask all the questions you want before you decide.

### Why is this research being done?

This research is being conducted to better understand how people learn in virtual reality environments. Our goal is to develop interfaces to virtual reality that are more natural and more effective for human-computer interaction and specifically improve human interaction within virtual reality systems.

Virtual experiences will increasingly be utilized to train and educate people as commodity virtual reality hardware makes its way to the public. The knowledge gained from this research is aimed at improving how humans interact with computer systems in the future.

There are no direct benefits for participating in this study.

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### How long will the research last?

We expect that you will be in this research study for approximately 60 minutes of total participation time, which includes this consent process time. A portion of the experiment time, ranging from approximately 15-30 minutes on average, will be spent viewing augmented or virtual reality environments. The remaining participation time includes pre- and post- experiment surveys as well as time to answer questions and debriefing.

### What will I need to do to participate?

Once the experiment starts, you will be asked to move around and explore a 3D virtual space and read information contained within that space. The way in which you move through the space and interact with it is the focus of this study. In all conditions, you will be trained on the specifics of how you will interact with the virtual environment. You will be asked to wear a virtual reality helmet that is connected to a backpack computer. This will let you walk around the lab freely if needed. In all conditions, researchers will be standing near you to provide a sense of safety in case you have any questions or concerns about the experiment. After the experimental condition, you will remove the virtual reality equipment and answer post-survey questions related to your experience in the virtual space.

***More detailed information about the study procedures can be found under “What happens if I say yes, I want to be in this research?”***

### Is there any way that being in this study could be bad for me?

The beginning section of this form described the potential minimal risks associate with this research, including the potential risk of headache, nausea, eyestrain, and fatigue associated with viewing images on computer displays and the risk that while using the head-mounted display, you may experience motion sickness, nausea, headache, feeling faint, or lose balance.

### Will being in this study help me in any way?

There are no benefits to you from your taking part in this research. We cannot promise any benefits to others from your taking part in this research. However, possible benefits to others may include better human-computer interfaces in the future.

### What happens if I do not want to be in this research?

There are no known alternatives, other than deciding not to participate in this research study.

## ***Detailed Information About This Research Study***

The following is more detailed information about this study in addition to the information listed above.

### How many people will be studied?

We expect about \_120\_ people here will be in this research study.

### What happens if I say “Yes, I want to be in this research”?

The procedure for each participant follows:

- After signing the consent document and agreeing to participate in the experiment, the researcher will answer any questions about the study that may arise from the participant.

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- The experiment will be described to the participant. Participants will be asked to explore a virtual cemetery and read information on the tombstones about the people that lived in the town. The participant's task is to learn what they can about the inhabitants while in the virtual environment. When the task is complete, participants will take a short assessment to gauge what they were able to learn while in the virtual environment. Participants will have limited time to read each tombstone. The limited time will be visually presented with a visual timer placed next to each tombstone. The timer will start when the participant is in front of the tombstone. The words on the tombstone will automatically disappear after the timer finishes.
- During the experiment, we will collect data on where you walk in the virtual environment and what you look at. We will also collect information on how long it took you to complete the experiment. Post experiment measures will record what you learned about the environment and how you felt about your experience.
- You will be trained with how to put on the virtual reality helmet and a short training experience in a simple virtual environment will be completed so participants understand how to move around and use the virtual reality interfaces and devices.
- At the end of the virtual exploration time, you will remove the virtual reality helmet.
- You will then be asked to complete a demographic survey, spatial updating and layout measures, the knowledge assessment and presence/simulator sickness questionnaire. These will all be completed outside of the virtual reality environment.
- You will then be debriefed about the experiment.

### **What happens if I say “Yes”, but I change my mind later?**

You can leave the research study at any time and no one will be upset by your decision. Please let the researcher know during the experiment if you change your mind later so that they can stop the experiment. If you change your mind during the experiment we will delete your data collected up to the point of withdrawal.

### **Will it cost me anything to participate in this research study?**

Taking part in this research study will not lead to any costs to you.

### **What happens to the information collected for the research?**

We do not collect personally identifiable information in this research study and do not associate your name with the data we collect. With that being stated, efforts will be made to limit the use and disclosure of your personal information, including research study records, to people who have a need to review this information. We cannot promise complete confidentiality. Organizations that may inspect and copy the information we collect include the Institutional Review Board (IRB), the committee that provides ethical and regulatory oversight of research, and other representatives of this institution, including those that have responsibilities for monitoring or ensuring compliance.

### **Data Collected**

During these experiments we record your positions and actions within the virtual reality environments. We also collect information about task completion time. Additional post survey measures help us understand how you felt about the environment as well as your observations about the environment. This data is stored digitally on password protected accounts.

### **Will I receive research results?**

No, the investigator(s) will not contact you about your individual results. If you are interested in this research,

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please feel free to follow-up with investigators at a later point to learn about any research findings.

### Whom do I contact if I have questions, concerns or feedback about my experience?

This research has been reviewed and approved by an IRB within the Human Research Protections Program (HRPP). To share feedback privately with the HRPP about your research experience, call the Research Participants' Advocate Line at [612-625-1650](tel:612-625-1650) or go to <https://research.umn.edu/units/hrpp/research-participants/questions-concerns>. You are encouraged to contact the HRPP if:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You have questions about your rights as a research participant.
- You want to get information or provide input about this research.

### Will I have a chance to provide feedback after the study is over?

The HRPP may ask you to complete a survey that asks about your experience as a research participant. You do not have to complete the survey if you do not want to. If you do choose to complete the survey, your responses will be anonymous.

If you are not asked to complete a survey, but you would like to share feedback, please contact the study team or the HRPP. See the "Investigator Contact Information" of this form for study team contact information and "Whom do I contact if I have questions, concerns or feedback about my experience?" of this form for HRPP contact information.

### Will I be compensated for my participation?

There is no compensation in this experiment. However, as deemed appropriate by the instructor from which class you were recruited, you may be compensated with extra-credit for class participation. Your participation in this experiment is completely voluntary.

Your signature documents your permission to take part in this research. You will be provided a copy of this signed document.

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Signature of Participant

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Date

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Printed Name of Participant

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Signature of Person Obtaining Consent

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Date

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Printed Name of Person Obtaining Consent