

Civil and Natural Resources Engineering
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HEC Ref: [2020/94/LR]

Application of Virtual Reality to study Human Behaviour in Fire – Individual movement within crowds

Information Sheet for participants in VR experiments

Kia Ora, you are invited to participate in a research study to explore the use of virtual reality (VR) to gather data for pedestrian movement. This study is being conducted by Luke de Schot from the University of Canterbury | Te Whare Wānanga o Waitaha (UC). The project is being carried out as a requirement for the degree of PhD, by Luke de Schot under the supervision of Professor Daniel Nilsson and co-supervision of Dr Ruggiero Lovreglio and Professor Rob Lindeman.

What is the purpose of this research?

This research aims to explore individual movement in crowds. The information from this study will help to improve the understanding of pedestrian crowd movement and improve safety in the built environment.

Why have you received this invitation?

You are invited to participate in this research because you have responded to a request for participants. Your participation is voluntary (your choice). If you decide not to participate, there are no consequences. Your decision will not affect your relationship with me, the University of Canterbury or any member of the research team.

What is involved in participating?

If you choose to take part in this study, your involvement will be wearing a VR headset and walking in a virtual environment. This means you will be walking in the real world (in a clear area) while wearing a VR headset where you will see yourself in a similar sized space but in a virtual environment. There will be markers attached to key positions on the outside of your clothing (e.g. heel, toe, knee and hip joints, and shoulder). As you walk along a line (or around a loop), information will be gathered by video recording or motion capture (MOCAP) which will be used later to measure walking parameters. It is estimated your total time requirement is approximately 40 minutes (15 minutes for task description, a vision test, marker setup, 15 minutes for VR simulations, 5 minutes for questionnaires during the VR simulation phases, and 5 minutes for a short post-experiment questionnaire about the quality of the simulation). In between VR scenarios, you will be asked to fill in some brief questionnaires about your experiences.

As this experiment examines the behavior of people walking, it is not suitable for wheelchair users or those with mixed ability who have difficulty walking unaided.

As a follow-up to this experiment, if you wish to, you may be invited to attend a later stage VR simulation.

Are there any potential risks involved in this research?

In the performance of the task there is a risk of bumping into real world objects. This risk is mitigated

by;

(a) having a clear free area in which to carry out the simulation, ensuring any obstacles are removed or otherwise protected from being contacted, and

(b) safety observers will be present to ensure you don't get too close to any obstacles while in the simulation.

Sometime when people are wearing a VR headset, they can feel nauseous, similar to motion sickness. If this happens to you at any time, please feel free to remove the headset, or let the researchers know and the simulation will end. A space is available to rest and recover from any short-term effects of nausea.

If you suffer from epilepsy or any sort of loss of awareness, or other symptom linked to an epileptic condition, please let the researchers know as this experiment is not designed to cater for this risk. If you suffer from any anxiety or stress related condition (e.g. PTSD), please take caution when deciding to participate in this experiment. If you would like to discuss these aspects further, please contact the research team.

To aid in efforts to combat the transmission of COVID-19, we will follow the UC guidelines based on current traffic light levels, this could mean a sign in register will be kept, and COVID-19 tracker QR code made available, as well as ensuring any personal equipment worn is sanitised thoroughly between uses.

What if you change your mind during or after the study?

Participation is voluntary and you have the right to withdraw at any stage without penalty. If you withdraw at any stage, you will still receive the voucher as a token of appreciation for your attendance and time taken. You may ask for your video recording to be destroyed at any point. If you withdraw, we will remove information relating to you. However, once analysis of raw data starts, it will become increasingly difficult to remove the influence of your data on the results.

Will the results of the study be published?

The results of the project may be published, but you may be assured of the complete confidentiality of data gathered in this investigation: your identity will not be made public. To ensure confidentiality, any identifying features such as your face will be obscured in any videos or images shown outside the research group.

What will happen to the information you provide?

Access to the data will be limited, stored indefinitely, and controlled by the project research team at the University of Canterbury. I will be responsible for making sure that only members of the research team use your data for the purposes mentioned in this information sheet. Any research papers or thesis using this data will be considered as public documents. Please indicate to the researcher on the consent form if you would like to receive a copy of the summary of results of the project.

Who can you contact if you have any questions or concerns?

For any questions about the research, please contact Luke de Schot:

Luke.deSchot@pg.canterbury.ac.nz, for any concerns, please contact Daniel Nilsson:

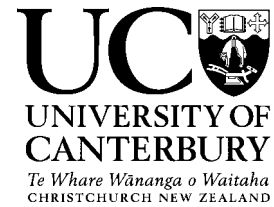
Daniel.Nilsson@canterbury.ac.nz, Ruggiero Lovreglio: R.Lovreglio@massey.ac.nz, or Rob

Lindeman: rob.lindeman@canterbury.ac.nz, who will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

If you agree to participate in the study, you are asked to complete the consent form attached.

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02 June 2022
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Participant Consent Form

Please complete each item, if you require further information or clarification on any point, please ask one of the researchers:

- ☐ I have been given a full explanation of this project and have had the opportunity to ask questions
- ☐ I understand what is required of me if I agree to take part in the research.
- ☐ I understand that participation is voluntary, and I may withdraw at any time without penalty. Withdrawal of participation will also include the withdrawal of any information I have provided should this remain practically achievable.
- ☐ I understand that any information or opinions I provide will be kept confidential to the researcher and the research team and that any published or reported results will not identify the participants. I understand that a thesis is a public document.
- ☐ I understand that all data collected for the study will be kept in locked and secure facilities and/or in password protected electronic form and will be stored indefinitely.
- ☐ I understand I will be recorded on video and/or motion capture equipment as part of the research.
- ☐ I understand the risks associated with taking part and how they will be managed.
- ☐ I confirm I do not suffer epilepsy and have not suffered a seizure, loss of awareness, or other symptom linked to an epileptic condition.
- ☐ I understand after completion of this consent form, I will receive a voucher/gift card to take away with me if I wish, even if I choose to withdraw from the experiment at any stage.
- ☐ I confirm I am aged 18 years or older.
- ☐ I understand that I can contact the researcher Luke de Schot or supervisor Professor Daniel Nilsson for further information. If I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)
- ☐ I would like a summary of the results of the project. (If you would like results please leave your email address below).
- ☐ I would like to be contacted about a future VR simulation. (If you would to be involved in follow up simulations please leave your email address below).
- ☐ By signing below, I agree to participate in this research project.

Name: _____ Signed: _____ Date: _____

Email address (for report of findings, if applicable): _____

Please submit to Luke de Schot, or any of the experimental staff.