Virtual Reality Thought Experiments

Abstract
Philosophers have long appealed to thought experiments for both experimental and pedagogical purposes. This project seeks to adapt philosophical thought experiments into virtual reality (VR). We seek to do this for two reasons. First, research (including our own) suggests that VR simulations not only more realistically mirror our choices in real-life situations but also that simulations improve knowledge retention and transfer for philosophical information. We thus believe these simulations are apt to be useful for both teaching and x-phi research. We have already made simulations of Philippa Foot’s trolley problem, Robert Nozick’s experience machine, and Judith Thomson’s violinist analogy. These simulations are available on Philpapers freely. We are seeking funds to continue this project so that we can finish three modules currently under construction: Peter Singer’s drowning child, Judith Thomson’s emergency room variant of the trolley problem, and a clinical bioethics simulator.

Basic Information
Project Coordinator(s)
Erick Ramirez

Funding Amount Requested
$4,962

Expected Project Completion Date
July 2020

Project Description
This project aims to achieve several goals, all of which we believe serve to benefit philosophy and public ethics. Initial seed funds, which supported the development of our initial round of modules (the trolley problem, the violinist analogy, and the experience machine) and partially offset the cost of the current modules, were provided both by Santa Clara University and a grant from Oculus Education. We are seeking funds to continue this project and allow myself and my undergraduate research assistants to finish our next round of VR thought experiment modules. These modules which will include Judith Thomson’s emergency room variant of the trolley problem, Peter Singer’s drowning child from his “Famine, Affluence, and Morality,” and a clinical bioethics simulator which we intend to help both students and those seeking continuing education in clinical bioethics decision-making. This final module, we believe, represents an exciting new application for VR to serve as a tool for continuing education in clinical and research ethics contexts.

Each module is designed according to the theoretical framework that has been outlined over the course of several publications both in press and in-progress which seek to outline the nature of VR experience, experimental ethics, and VR experimental design. Interested readers are directed to consult Ramirez 2017, Ramirez 2019, and Ramirez & LaBarge 2018 for more on the specific theoretical frameworks related to VR.
design and VR ethics. The modules we are developing (and those we have already made freely available) are meant to serve as exemplars of ecologically valid but nevertheless morally permissible VR simulation.

**Project Impact**

In terms of advancing the field of philosophy, we believe that our project has already borne useful fruit. On the one hand, we have learned much about simulation design and, importantly, simulation ethics which has resulted in three published articles with three more articles under review or under revision. We have also already completed four modules and, with the permission of David Chalmers and David Bourget, have made them publicly and freely available for anyone to download from the Philpapers archive. These include a VR training room, a simulation of the trolley problem, the experience machine, and the violinist analogy. Combined, these modules have been downloaded over 250 times as of this writing and have been used in three philosophy departments (that we know of) in various pedagogical contexts. I am also in progress on a manuscript related to these modules Building Ethics Virtual Worlds. I have also written or been interviewed for several public philosophy pieces on the nature and ethics of VR which were a direct result of this research for outlets like Aeon, Yes! Magazine, the Mindfield youtube series, and Daily Nous.

Because these modules are freely available for anyone to download and use, we also believe that the potential for significant community outreach exists with this project - especially once we have a larger variety of simulations integrated into our module package.

**Project Goals**

- To provide VR modules of classic philosophical thought experiments to other philosophers, moral psychologists, and the public at large.
- To assess the merits of virtual reality thought experiments for enhancing knowledge retention and transfer of philosophical concepts
- To assess the feasibility of the concepts of perspectival fidelity, context-realism, and virtually real experiences for moral psychological research

**Project Timeline**

**Fall 2019**

Complete construction of virtual environments for all three simulations

Work with research assistants to conceptualize choice scenarios in all three simulations aiming for choice scenarios that balance ecological validity with ethical simulation design

**Winter 2020**

Begin scripting sequences for all three simulations

Begin recording voice-overs for diverse characters (virtual agents have randomly generated gender presentation and hence require several voice-overs for each interaction with the subject)

Begin testing of simulations

**Spring 2020**
Finalize modules and release on Philpapers

Incorporate modules into complete module package for use in teaching and research

Establish rubric for assessing knowledge retention and transfer for future pedagogical research

Advertise modules (possible venues include: Daily Nous, Medium, the APA blog)

**Project Outreach**

We foresee three distinct audiences for this project:

1. Philosophical curious lay audiences: this project will be distributed freely across several platforms (Philpapers, the Steam Store, and the Oculus Store). Current modules have been hosted only via Philpapers and have already been downloaded 256 times (as of 06-11-19). Because Oculus Education has funded earlier iterations of this project and has promoted our research in the past <https://www.oculus.com/blog/oculus-education-partners-with-research-institutions-to-explore-vrs-impact-on-learning-outcomes/> we plan to continue this relationship to leverage Oculus’ reach to help non-philosophers become more familiar with our modules and thus to become more familiar with this classic philosophical issues.

2. Moral psychologists: philosophers and psychologists interested in VR’s immersive power to gather more realistic data will also have an interest in our modules. In part we are reaching this audience by publishing in peer-reviewed journals on the nature of vr experience, vr ethics, and vr experimental design. We have also published pieces on online magazines (Aeon, Yes! Magazine, Medium) and will continue to do so to publicize these new modules.

3. Educators: philosophers, especially those who teach ethics and bioethics, often use thought experiments pedagogically. We believe that these audiences will also have an interest in leverage the immersive and affective power of VR simulations to enhance knowledge retention and transfer of ethical concepts. We aim to reach out to these audiences, in part, via the same tools as in #2, however we also have an article in the works aimed directly at pedagogically oriented philosophical research which we believe will help publicize the materials we generate as a result of this APA Small Grant.

**Accessibility Plan**

VR, by its nature, is built to help users experience situations that would be difficult (sometimes impossible) for them to experience otherwise, regardless of physical or neurodiversity.

All of our simulations are designed so that they can be experienced as sitting experiences, standing experiences, and (for those with room-scale VR) as walking experiences. We have tested our already-released simulations with students of diverse abilities both mobile and sensory without issue (i.e., all have been able to complete our thought experiment simulations without issue). We aim to continue to design our simulations with this goal in mind.

Our modules are also being designed to randomly generate the gender and racial presentations non-player avatars so as to mitigate the effects of implicit and explicit bias. We find this a useful design choice not only for ethical reasons but also for experimental ones. As an additional note, we have (and will continue) to
release all of our material free of charge for anyone to use, removing what we take to be an important barrier to VR use.

**Evaluation Plan**

Assessment will take several forms. First, we intend to run several in-house beta testing events involving undergraduate students at the Santa Clara University campus in order to assure that the modules, once completed, are faithfully serving their philosophical purpose. I will also incorporate these modules into my own upper-division course ‘Philosophical Issues in Virtual Reality’ to further gauge their pedagogical effectiveness.

Second, our simulations will be made available at the Philpapers.org website where we invite feedback from philosophers and other users around the world.

Third, in conjunction with The Markkula Center for Applied Ethics, we aim to get feedback from clinicians on the veracity and usefulness of our clinical bioethics simulator. Our long-term goal is to continue to develop this simulator in order to promote its use as a tool for continuing education credits in bioethics.

Given the continuing nature of the product, feedback about what works and what can be improved will be incorporated into future refinements of existing and future modules.

Fourth, in terms of assessing the empirical uses of these modules, we aim to develop and test rubrics for using these modules to assess knowledge retention and transfer. Although these empirical projects are not within the scope of the APA Small Grant Fund application (we are seeking funds to complete the modules and not to fund specific research that uses them), we aim to make these rubrics freely available as well for others to use.

**Online Presence**

These modules will be hosted in several places:

4. The Steam Store [https://store.steampowered.com/](https://store.steampowered.com/)

*Although these are electronic storefronts, our modules would be made available free of charge on all of these sites.

**Budget Narrative**

Prior grants from Oculus Education, Santa Clara University, and the Markkula Center for Applied Ethics have allowed for the purchase of hardware and for funding undergraduate research assistants for the first two years of the project. APA Small Grant funds are being requested to complete the current block of in-progress simulations. Specifically, we are seeking APA small grant funds to pay undergraduate research assistants for their time on the project (we do not have any graduate students in philosophy at Santa Clara University). Undergraduate research assistants do not receive course credit for their work and are officially employed as research assistants. Faculty members associated with the project are not paid for their involvement.
Our undergraduate research assistants have specialized skills which have been, and continue to be, critical for the completion of the project. In particular, our research assistants are familiar with the C# programming language, the Unity software development platform, and are also either Philosophy majors or minors.

The minimum wage in Santa Clara County (where Santa Clara University is located) is set to rise to $15 per hour for the 2019-2020 academic year. We have been paying student research assistants $16 per hour over the last two years and would like to continue using this wage with current project funds.

We are estimating that it will take an additional 310 hours of student labor to complete the current set of projects over the course of the 2019-2020 academic year (September - June). Thus we are asking for a total of $4,964 in APA Small Grant funds.