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CS464 - HCI

<u>Project Proposal</u>

COVID Disclaimer - *Please note that the following experimental design is hypothetical. Because of our current meeting and travel restrictions due to COVID-19, this experiment portion will not actually be completed. The purpose of designing the experiment is to show that we are capable of doing so. We have supplemented performing the experiment with putting in more effort into the program itself and processing more background research, in order to have a better grasp on our subject.*

Project:

Our team will be creating a virtual reality (VR) program that will teach how to build a computer. There will be two different modes within the project: free play and tutorial. If time allows, we will also make different levels for the user to test what they have learned from the tutorial and free play modes. The free play mode will allow the subject to use all available computer components, and build the components together with no instruction. The tutorial mode will have steps that will walk the user through assembling the different components required to build the virtual computer. The tutorial will use progressive disclosure by showing only one component at a time: the component to be added to the computer next. The current part will be labeled, and the tutorial will give a visual cue as to where the component should be added to the computer. In this manner, the tutorial will walk the user through building the virtual computer one component at a time. In both freeplay and the tutorial, when assembling the components, the virtual computer components that belong together will snap in place when placed onto each other. By the same logic, components that don't belong together will not snap into place if the user tries to connect them. The different computer components required to assemble the entire computer will include:

- Motherboard
- CPU
- GPU
- RAM
- PSU
- Network card
- HDD/SSD
- CPU cooler
- Thermal paste
- Risers

Experiment:

For the testing aspect of our project, we will be comparing the effectiveness of our training program to the effectiveness of other training programs that teach how to build a computer. Our tentative plan is to split our participants into two groups, with our program and a youtube tutorial series as the two independent variables. We will then judge the performance of these two groups and their ability to build a computer. This judgement will be in the form of a written test, or (if time and resources permitting) taking the physical components of a computer and building it. The written test would consist of diagrams and parts which ask the subject to identify and place in the correct location, and important tasks that are needed to be completed when building a computer.

Resources:

For this project we will be coding our project in Unity and be using an Oculus Rift S VR headset. For the various scripts, objects, and models we will be using the Unity library "Oculus Integration". This library was made by Oculus and uses their own technology to allow for the interaction. Because of this, the game may only run on Oculus VR headsets (Oculus Rift, Oculus Rift S, Oculus Quest, and Oculus Go). The PC building game will not be intensive and therefore will not need a high-end gaming machine. The machine the game is running on has an AMD Ryzen 5 3600 CPU, 16GB RAM, GeForce GTX 1050 Ti graphics card, and a MSI MPG X570 Motherboard. This is overkill for the project, but helpful for the VR headset to run smoothly on other games and applications.