Title: An investigation on how virtual reality can influence sensory perceptions of reality.

Introduction

Virtual reality provides visual experiences via optical immersion. A key feature of VR is its capability to induce complete visual immersion. If a user is completely immersed within their virtual domain, the domain itself could be altered to enhance their experience. Redirected walking is an example, where subtle rotation of a virtual plane subconsciously prompts a user to change direction (Razzaque, 2001) emulating a larger domain for walking.

The aim of this project is to understand ways virtual reality can influence sensory perceptions of reality. A key part of the project experiment will use VR to make small nuanced changes to a user’s sensory perceptions without their knowledge. Such an influence should make a participant believe they’re operating in one way, when in a real world domain they are subtly acting in another.

This dissertation will comprise two separate experiments. Both experiments will exhibit a scenario in both a real and virtual environment. The virtual domain however, will dynamically alter in order to divide real and virtual world perception. From this, differences in participant actions between the two domains will be exhibited. Therefore VR’s influence on a user’s reality can be evaluated and discussed.

Initially experimental scenarios have to be defined, this will require research into how perception can influence a human’s decisions. Next, the Unity 5 game engine will be utilised in order to create and animate a virtual environment. A HTC Vive headset will place a user in the virtual environment. Its software plugins will be added to ‘Unity 5’ in order to create an intractable domain. Depending on scenario choices, real world apparatus will likely need to be sourced for interaction in real and virtual planes.

For the future, VR has applicability in social media. Since VR creates a sense of presence, it may provide a more personal way to communicate over long distances instead of web-cam chats. It is therefore understandable why Facebook acquired Oculus in 2014.

VR has also potential applicability within the gaming industry. However, its emancipatory confounds restrict exploration and varied motion, which in turn breaks the illusion of walking around a real domain. This problem has been addressed with add-on hardware such as the Virtuix Omni. However two key obstacles face a 3rd party hardware solution (such as the Omni). Metaphorically its integration with developed software and literally its potential size. This indicates the need for a different solution. One way investigating VR’s influence on real perception could form a solution, is by examining how virtual motion could simulate real motion. Therefore giving a player the sensation of traveling a long distance virtually than that in reality, and thus increasing the perceptive size of the virtual domain.

References

Sharif Razzaque, Zachariah Kohn, Mary C. Whitton . (2001). Redirected Walking. *Eurographics 2001 - Short Presentations*. 1 (-), -.

\item Research at least 5 pieces of literature which concurrently share the topic of human sensory perception before designing an experimental scenario.

\begin{itemize}

\item This research will be a crucial asset when constructing a system and scenario that targets the primary aim. Information will be discovered through research of academic journals and books relating to VR and cognitive science.

\end{itemize}

\item Design 2 experimental scenarios, which force a participant to rely on a sensory system to achieve a given goal.

\begin{itemize}

\item A scenario presents a task and prompts the user's to achieve a goal. A given task will to be very simple, i.e. walking in a straight line towards a point. Simple tasks will enable a clear and concise way to gather evaluative data. The scenario will be displayed within a virtual environment; therefore technological possibilities and limitations have to be considered.

\item Scenario designs will be in the form of storyboards.

\end{itemize}

\item Design 2 VR systems which appropriately meet the needs of each scenario design, before any software implementation.

\begin{itemize}

\item The system design will incorporate all requirements from the scenario.

\item Hardware and software requirements will be considered in order to outline realistic capabilities of the system.

\item Designs will be in the form of UML diagrams.

\end{itemize}

\item Develop 2 VR systems which accurately follow their design schematics and appropriately presents the scenarios.

\begin{itemize}

\item The system will adhere to the design schematic using the Unity 5 Game engine to create the virtual environment. A HTC Vive will be utilised to display the scenario and track the user within a virtual plane.

\end{itemize}

\item At the end of the project, evaluate future applications of the developed technology.