Product Vision

Background

The field of Virtual Reality (VR) technology has in the last few years taken great leaps forward. New VR systems released by Oculus and HTC and other alternatives have set the new low cost standard of VR systems (Riva & Wiederhold, 2015). Because of the recent hype, more attention has been given to the applications of VR.

Software and applications for VR have been in development since the concept of VR arose. While the recent trend tends to focus more on entertainment and gaming, more serious applications have been studied and developed for many years, with many having focus on health care.

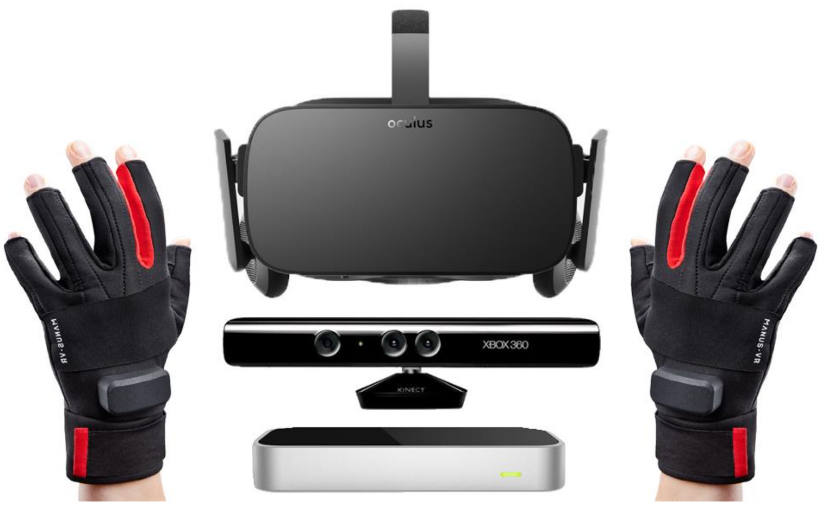
Benefits of VR

The benefits of using a VR system is the factor of immersion that no other piece of technology can provide. As stated in one study (Rothbaum, Hodges, Smith, Lee, & Price, 2000) the technology provides the user a sense of presence or immersion in a virtual environment. For applications in health care, immersion is an important factor. According to Riva and Wiederhold (2015), physicians and surgeons benefit most from VR if all human senses can be virtually represented in a way identical to their natural counterpart. They also stated an alternative application of VR, that are more in line with the needs of therapists, where VR is used to provide a human-computer interaction in which the user becomes an active participant in the virtual world. Our product will focus on this concept to make this idea a reality.

Extending hardware for VR

A lot can be achieved with the features that current VR systems provide. As stated by Saposnik (2016), most VR systems provide primarily visual experiences and only some include some form of haptic feedback. Therefore, some movement of our physical body, like hand and finger motions, can currently not be tracked by most systems, preventing the desired interactivity with objects in the virtual world. For this, new hardware has been developed in recent years to complement VR systems.

A study by Tsoupikova et al. (2015) made use of a custom actuated glove dressed with various sensors to track hand joint angles and other magnetic trackers to track arm and hand movement. This primitive system was more than enough to provide desired results for their study. Our product will instead make use of the latest and greatest hardware such as Leap Motion (Colgan, 2014) and Manus VR (Manus VR, 2015), to provide tracking for hand and fingers movement. A Kinect (Microsoft, 2016) will track the motions of the whole body. The next step is to develop the application that will make use of these hardware.

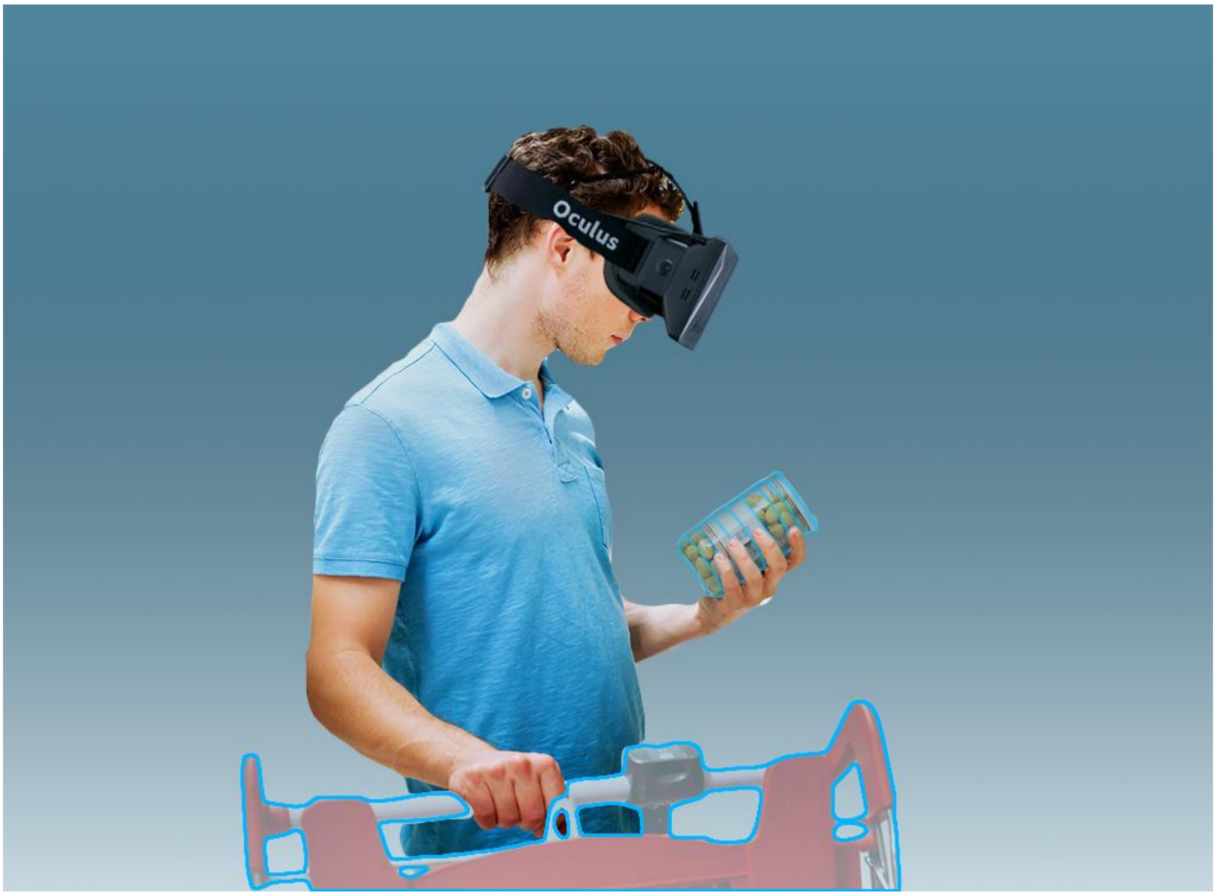


Our product

The application will be the core of our product. The system will use the Kinect, Leap Motion and Manus VR to provide the ability to interact with objects in the virtual world. Using the data provided by the Kinect it will translate full body motion while the other hardware will be used for translating hand and finger motion. The software will be developed on Unity3D, where environments can be built for testing and application purposes.

Our product will provide a solution for human-computer interaction in the virtual world and will be able to complement existing VR systems used by therapists to rehabilitate clients. For this we need to satisfy the needs for both therapist and clients. We assume that a common need is system stability; the experience must always stay consistent under any circumstance.

For a recent example where our product provides a solution to, we must look to a VR system in development at CleVR which provides therapists with tools to help their clients overcome fear and anxiety (CleVR B.V., 2014). This system exposes a user to environments which they are not comfortable with. While this system works for static environments, environments that are more dynamic in nature, like a supermarket, poses some problems. In the context of a supermarket, the system lacks the ability to interact with grocery products. This is something our product can solve by complementing the current system in place. Our system makes it possible for the user to pick up virtual grocery items to improve the immersion of the simulation.



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