



VR Interface for Telemedicine

Vision Statement

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1. Project Description

1.1. Background

In today's world, telecommunication and information technology make it possible to provide clinical health care to remote areas of the globe. Doctors can remotely see patients via a dashboard interface with video and clinical controls. However, this user experience is limited by traditional controls, such as keyboard and mouse. Touch screen innovations allow simple swipe gestures to navigate the dashboard, but limit the access physicians can have to a variety of information.

As virtual reality (VR) becomes more mainstream, we recognize the potential for using VR to create a more powerful and efficient user interface, aimed towards enhancing physician experience and making their jobs easier. A VR interface, coupled with detecting hand gestures, can make the beautiful cinematic interfaces from science fiction into reality.

1.2. Outcome

The goal of our project is to give doctors more accessibility to real-time patient information and records through an immersive user experience. Our VR interface will allow doctors to pull up vital signs and access simultaneous data and imagery windows, and will support hand gestures.

The interface and the system we plan to design will include gesture detection and interpretation so that doctors can use hand gestures to determine patient status and to

communicate instructions to the hospitals and the patients. Doctors should be able to view multiple scan images either side by side or on top of each other and be able to interact with basic image manipulation functions to move, resize, rotate, and pan the image, as well as basic image editing functions to change the opacity of the images when overlaid.

Reach goals include a recording of gestures and instructions and sending these to patients (e.g. wrapping a bandage or performing CPR), a live video feed between doctor and patient, and an access to a 3d model of the human body for the doctor.

1.3. Milestones

- Get familiar with available choices of VR hardware and decide the platform we will be working on.
- Get familiar with the toolchain will be used to implement the system.
- Set up development environment, toolchains and workflows such as versioning and testing with continuous integration.
- Design the structure of the system, interface, and gesture representations.
- Use Agile software development to build the system iteratively and make improvements based on design feedback.
- Implement and integrate the system on real hardware.

2. Solution Design and Articulation

2.1. Platform and Technologies

- Hardware: Oculus Rift, Leap Motion, HTC vive, Samsung Gear VR
- Framework: Unity
- Language: C#

2.2. Process Overview

We will apply Agile software development and Extreme programming for the project, so that the system is built iteratively and incrementally by first providing an initial demo and then improving it based on the user and mentor feedback until a fully functional system is built.

Also, we will contact market manager of InTouch Health and some local doctors to watch and test our product demonstration so that they can give us feedback about their demands and the overall workflow of the VR interface and hand gesture designs.