



LABORATORY FOR  
**Computational  
Sensing + Robotics**

# SIMULATION ASSISTED NAVIGATION SYSTEM HARDWARE MANUAL

VERSION 1.0

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## Overview:

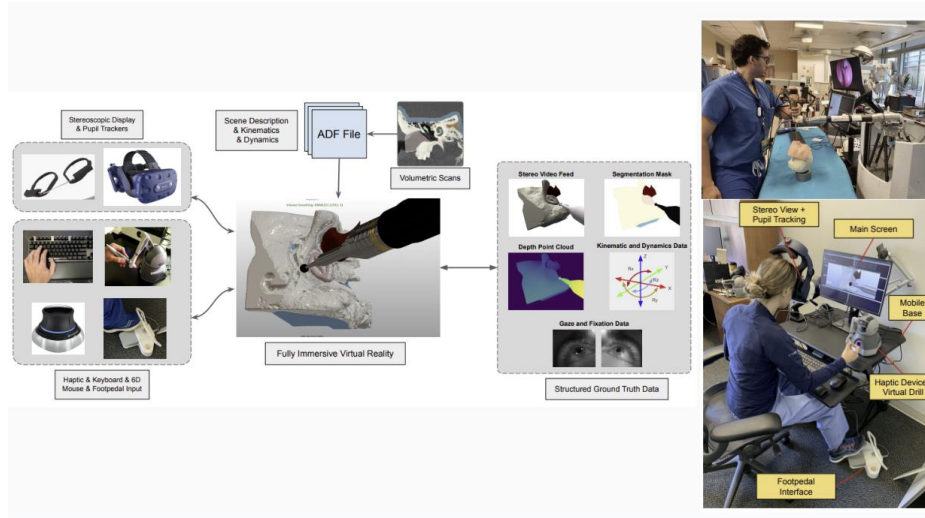


Figure 1 Hardware relationship

Hardware required in the project include stereo microscope, medical video camera, router, optical tracker system, probe & model and haptic device. Part of the relationships between them are shown in figure 1.

## 1. Stereo microscope

The type of stereo microscope is the Haag-Streit microscope. Haag-Streit delivers breakthrough versatility and precision in microscope technology for ophthalmology. With over 140 years of experience in surgical tool manufacturing, they set the standard for optics, ergonomics, engineering, and imaging. This surgical microscope provides best-in-class stability and 3D perception.



Figure 2 Using Haag-Streit microscope

To use it, we first need to remove the protective cover on it. And then open the green switch on the side. There are many buttons on both sides' handles, which can move the camera, adjust

the light and focus. During the usage, we should take care not to touch the lens or they will be polluted and make the video vague. After using it, we need to close the switch and put the protective cover back. It is important to close the switch because the light of the microscope is strong and can produce huge heat after running for a long time.

## 2. Medical video camera

As shown in figure 3, we use “Sony MCC-3000MT 3D Full HD Medical Video Camera” to record videos from the Haag-Streit microscope. Since everything is already set and connected, we just need to open the camera when using it and close it before we leave.



Figure 3 Sony MCC-3000MT 3D Full HD Medical Video Camera

## 3. Router

The video recorded by Medical Video Camera is transmitted to the lab computer. Since a lot of research projects need that computer, it is not recommended to install packages and do video processes on that computer. A router is used to transmit videos from that computer to our own computer, as shown in figure 4.



Figure 4 Router

We need to connect both computers to the router through internet cables. A special type of internet cable is required to prove the speed of transmission.

#### **4. Optical tracker system**

Will be updated after we finish this part.

#### **5. Probe & model**

Will be updated after we finish this part.

#### **6. Haptic device**

Will be updated after we finish this part.