6.3.1 Kinect Hack: The vibration wrist belt.

Figure 13: Prototype vibration wrist belt (Nylon Velcro belt)

So how does it connect to the computer or Kinect?

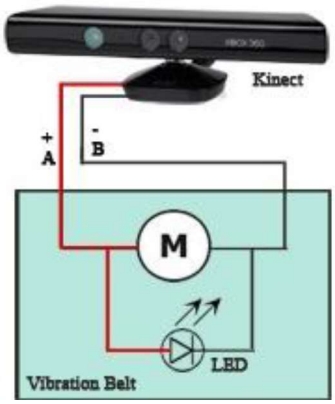

Figure 14: OARC System Vibration wrist belt

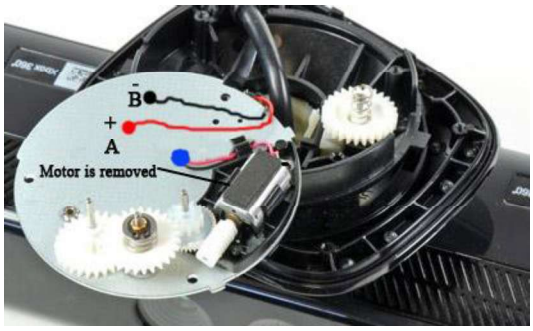

Figure 15: Kinect for Xbox 360 motor

In figure 14, the circuit design of the vibration wrist belt is shown. The M stands for motor and the motor is installed inside the small capsule as shown in figure 13. A bright led is attached as the output from Kinect sensor changes polarity as the Kinect adjust its sensor to scan up and down to position itself. As the Kinect also uses dc motor as shown in figure 15, the change of polarity should affect the motor. The reason to use LED is because of the change in polarity and to protect the dc motor from any damage. However to use vibration belt, the ability of Kinect to adjust its angle of view is scarified.

The Kinect motor in figure 15 is removed or disabled and the positive wire (+A) of Kinect is connected to positive (+A) of the belt and same for negative wire (-B). Now if we call the Kinect's tilt motor to tilt, the vibration belt will be activated. This was hack didn't took a while as multi-meter was used to check the voltage and current.

6.3.2 Kinect Hack: Safety helmet with Kinect installed.

After making the vibration belt to alert the user, the helmet need to be designed.

Front View

Back view

Helmet with strap

Figure 16: Safety helmet with Kinect installed

The vibration belt has 3.5 mm stereo jack which can be plugged into the helmet. The helmet is designed to have 3.5 mm female connector as seen in figure 16 (back view).

Jack for the vibration belt

Helmet inside view

Figure 17: Safety helmet with Kinect installed.

Four screw were used to secure Kinect on top of the safety helmet. As shown in figure 17 (helmet inside view) and wire is drilled from top of the helmet. Female 3.5 mm connector is secured as shown in figure 17 (left). Hence if the blind person wants to unplug it, they can do so by just unplugging the vibration belt motor's jack (figure 13 [left]).

Figure 18: Testing the hardware for any amendment

After designing the OARC System's vibration wrist belt and helmet, it was tested for any extra arrangements. * The OARC System is intended to work for night scenario.

6.4 Hardware and software requirements

6.4.1 Hardware for running OARC system source code or software.	
Computer	Type: Portable light weight laptop or full windows based laptop Network: Wi-Fi 802.11b/g/n wireless adapter Minimum CPU: Dual core 2.66-Ghz or more Processor: 32bit or 64bit RAM: At least 2GB Ports: USB 2.0/3.0, Audio in/out
Special hardware	Requires Vibration wrist belt (See 6.3.1) Requires Kinect helmet (See 6.3.2) Earphone with Microphone or separate

Table 7: Hardware requirement for OARC System

6.4.2 Software required for running OARC system's source code	
Operating System:	Windows 7, Windows 8
Programming Language	Microsoft visual studio Professional 2010 Microsoft visual studio Professional/Ultimate 2013
Wi-Fi API	NavtiveWi-Fi API (ManagedWIFI) *Check CD
Speech	Microsoft SAPI 5.1, 5.2, 5.3
Framework	Microsoft .net Framework minimum 4.1 and above

Table 8: Software requirement for running OARC System Source code