The materials that create immersive virtual reality experience

Science, Computer Science

VR stands for Virtual Reality, which is a simulation of another reality created by designers and programmers. Virtual Reality (VR) is the use of computer technology to create a simulated environment. Unlike traditional user interfaces, VR places the user inside an experience. Instead of viewing a screen in front of them, users are immersed and able to interact with 3D worlds. Most high-tech VR comes with binaural 3D audio which makes it more realistic and our brain think we have been transported to another world. This strengthen the feeling of " presence" just as when we feel like we are present somewhere else and our brain begins to believe this new " virtual reality."

The history of VR can be traced back to 1930s when a professor named Stanley G. Weinbaum explains a goggle based game in which individuals can watch a holographic recording (3D) of virtual stories. This amazing vision of the future would actually turn into what we think of as virtual-reality today. The development of VR became a huge concern for many of the world's top developers again when Oculus Rift was formed out of a kick-starter campaign in 2012. After a few years of research and development, the VR has become more advance as today. [Liza B., 2017]

VR has dominated tech headlines in recent years with its ability to immerse its users in a virtual, yet safe, world. Gaming is one of the more well-known uses for VR but its potential does not stop there. VR also has been used in various sector such as military. VR can simulate different dangerous situation during warfare so that the soldiers are well-prepared. Besides, VR also has been used for sporting events. For instance, viewer can stream live events

and feel like just in the crowd by just having a VR device. Furthermore, VR also use for medical training such as operating a simulated surgery, and education purposes such as exploring the vast universe. From military use to domestic use such as just watching a movie, VR has proven its functionality, and it is believed that in the future, VR will become indispensable need just as our computer. [Alayna M., 2017]

A typical VR consists of various parts where each parts play an important role in order to make it functioning well. For instance, the outer part of the VR is the casing where serve as a housing for all the components. Besides, a VR device contains comfort padding which provides a contact surface for user, display screens to display the images to the user, lenses to allow user to see the images, microphone to communicate with other users, headphone to listen, and so on. On top of that, a VR device must contain a circuit board which is as important as human brain. This is because the circuit board is the place where all the electronic components are located in order to perform image-processing and simulation.

There are several considerations should be concerned in the manufacturing of a VR device. Firstly, the overall weight of the VR must be light. This is because the VR is worn in the user’s head and if the VR is too bulky, then it will cause soreness on the neck muscle of the user. Besides, the overall tensile strength of the VR must be high so that the VR will not deform easily when user accidentally drop on the floor. On top of that, the material used for the manufacturing of VR must also corrosion-resistance, so that the VR can last longer. Furthermore, the material used to make the inner part of the

VR must be soft to ensure the comfortability for the user for a longer session of usage. Other than that, the cover for the VR must be electrical insulator to prevent electric shock occurs which is fatal to ensure safeness of the user. The display screen of the VR must be as wide as possible so that the whole virtual world can be displayed vividly infront of the user. Lastly, the lenses should be specially designed so that the images can be clearly seen by the user even though the display screen is just a few centimetre away from the user’s eyes.

Henceforth, the materials for the making of every parts of the VR must be well-chosen to achieve the desire requirements. The mechanical properties such as tensile strength, yield strength, modulus of elasticity, and hardness of every material must be well-study in order to choose the best materials. Therefore, in this assignment, four major parts of a VR device which include the casing, comfort padding, printed circuit board, and lenses, are studied and investigated to decide the best materials for each of the chosen parts.