A Review Paper on Oculus Rift Headset

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Abstract: What was once the stuff of Hollywood vision is now becoming a reality? A start-up called Oculus VR is creating personal virtual-reality goggles called the Oculus Rift for one and all to use. Virtual reality isn't new. But humans have been trying to create a device to create virtual reality which is as close as reality and the Oculus Rift is one of the devices which took us nearest to creating a dream like environment.

General Terms: Virtual Reality

Keywords:
Immersive, Head Mounted Devices, Oculus Rift, SDK (Software development kit)

I. Introduction

Virtual Reality can be defined as surroundings which are simulated by a computer system. The environment can mimic the real world or it can be a replication of a completely Imaginary world. And knowing about virtual reality is necessary because in the end we have to create it as an end product. Oculus Rift is a Head Mounted Device which fits over the Head, covering the user’s field of vision. Because to create the 3-D virtual reality Immersive vision is required to obtain the feel of being inside the real world even it imaginary. It gives you ease to step into virtual world and explore it and feel it like real world by tracking users movement and simultaneously repeating them in virtual world or game for example if user turn his head left then the scene also rotate to show left side of vision. So far Rift is the available for developer community only to check its limitation and to promote the development of content for device.

II. Device Specifications

The Oculus Rift is soon going to release for consumer use but at present the Software Development Kits (SDK)[i] are released named as SDK1 and SDK2. In which SDK2 is more advanced than SDK1.

A. System Requirement:-

To use these Kits with a computer developed and controlled environment following system requirements must full fill:-

- NVIDIA GTX 970 / AMD R9 290 equivalent or greater Video Card
- CPU Intel i5-4590(4th Generation) equivalent or greater
- Memory 8GB+ RAM
- Video Output Compatible HDMI 1.3 video output
- USB Ports 3x USB 3.0 ports plus 1x USB 2.0 port
- OS Windows 7 SP1 64 bit or newer( With SDK2)

B. Operating systems:-
The Oculus SDK currently supports following OS:-

- MacOS
- Windows (Vista, 7, 8)
- Linux.

III. Working of Oculus Rift

![Diagram of basic working of Oculus Rift]

Fig 2: Basic Working of Oculus Rift

Picture a set of goggles in which a large OLED (Organic light Emitting Diode) display replaces the glass. The screen displays two images alongside, one for every eye. A set of lenses is positioned on top of the screen, focusing and reshaping the depiction for each eye, and creating a stereoscopic 3D image. The goggles have embedded sensors (STM 32F103C8 ARM CortexM3Micro-controller with 72MHz CPU) that monitor the user’s head motions and adjust the image accordingly. The latest version of the Oculus Rift is bolstered by an external positional-tracking accessory, which helps track head actions more accurately. The result is the feeling that you are looking around a 3D world. This can also be seen from the following picture.

![View Created by the immersive Vision]

Fig. 3: View Created by the immersive Vision

IV. Scope and Application

The earlier uses of Oculus showed the potential of technology and the start-up gets good initial support. The application of oculus evolved with development in SDK’s, like uses in Medical field[4] for the treatment of psychological disease (ex. PTSD, Phobias etc.) or in construction in which we can create virtual building to show how will it look and feel after being completely constructed[5]. But it is mostly viewed as a gaming technology to provide a rich experience of gaming with physical interfacing. There are technologies to train pilots, but when it came to ground troops we take too much of resources to create artificial environment but oculus provide a better solution to it and developers are exploring more and more application with time to use this technology.

V. Conclusion

The early impression of the Oculus VR was extremely encouraging and helped in the development of different SDK. And its capability to produce immersive vision[6] and realistic environment made it most awaited technology of the VR. But the danger of being addictive to the virtual world and different psychological affect stay still. On the other hand Oculus seems to be the best devices in virtual reality creation and future of portable VR devices.

References