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RESEARCH ARTICLE

A REVIEW PAPER ON VIRTUAL REALITY OCULUS RIFT AND AUGMENT REALITY

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ABSTRACT

Aim of my research paper is focused on Virtual Reality, Oculus VR/Rift and Augment Reality. Secondly this paper also includes the study of applications to Virtual Reality and Augment Reality their connection, behavior and working.

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INTRODUCTION

I.Virtual Reality

Virtual Reality is an imaginative, illusionist world, which gives the sensation that you are inside the artificial world created through computer software's with simulations. VR works in 3D form where the subject can move in X, Y and Z direction. Images are created using depth to create the virtual experience. VR is on immersive medium which transports you in virtual medium. (3 Dimensional world) Virtual reality helps to create simulated environment which helped in the innovation of immersive films and the video games. Oculus rift and oculus VR are the major players in performing virtual reality (Oculus, 2014)

II.Oculus VR/ Oculus Rift

Oculus Rift plays an important role in virtual reality as it gives the feel of being in 3D virtual world. Basically it is headset which users wear into head with strap onto it to step into virtual gaming world. Oculus VR the makers of oculus rift headset originally funded as a kickstarter projects in 2012 and engineered with the help of john Carlmark became the leader company of VR for video games company. (Oculus, 2014)

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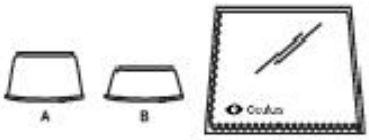
III.How Oculus Rift is connected to the virtual World

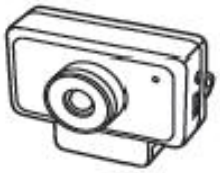
For connecting an Oculus Rift you need to have the Oculus Rift development kit which contains:- (Oculus Rift Development Kit 2 Quick Start Guide, 2014)

1.A complete headset with detachable cables

2.Lenses



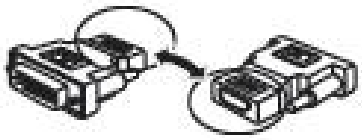
3.Position tracker



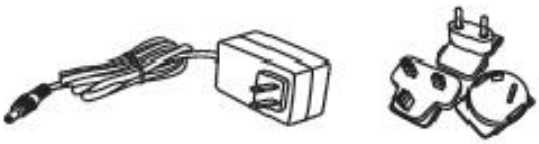
4.Positional tracker USB cable

5.Positional tracker sync cable

6.DVI to HDMI adapter

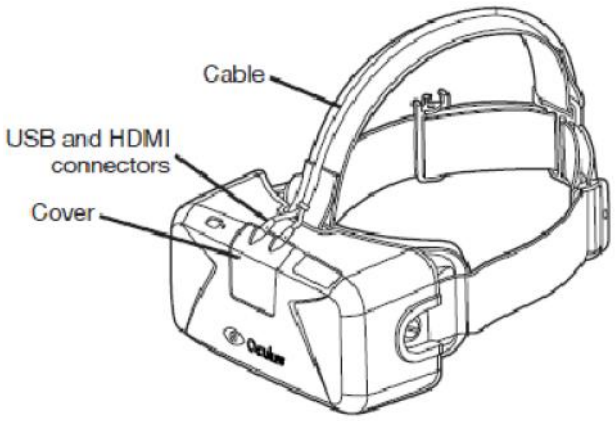


7.Power adapter

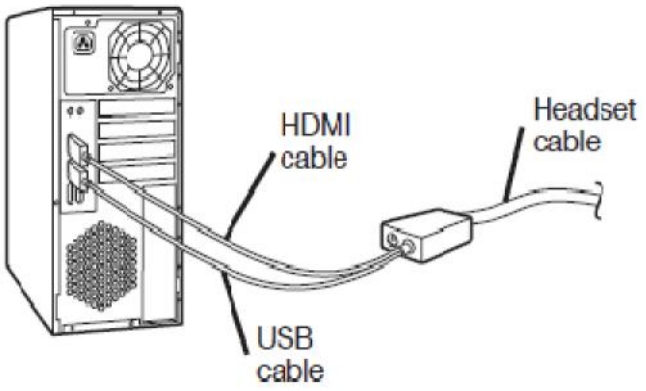


IV.Procedural to connect the Oculus Rift:-(Oculus Rift Development Kit 2 Quick Start Guide, 2014)

1. The software for the Oculus development kit is to be installed by downloading it.
2. Set up the head set : The HDMI and the USB connectors are attached to the headset by removing the cover of the head set

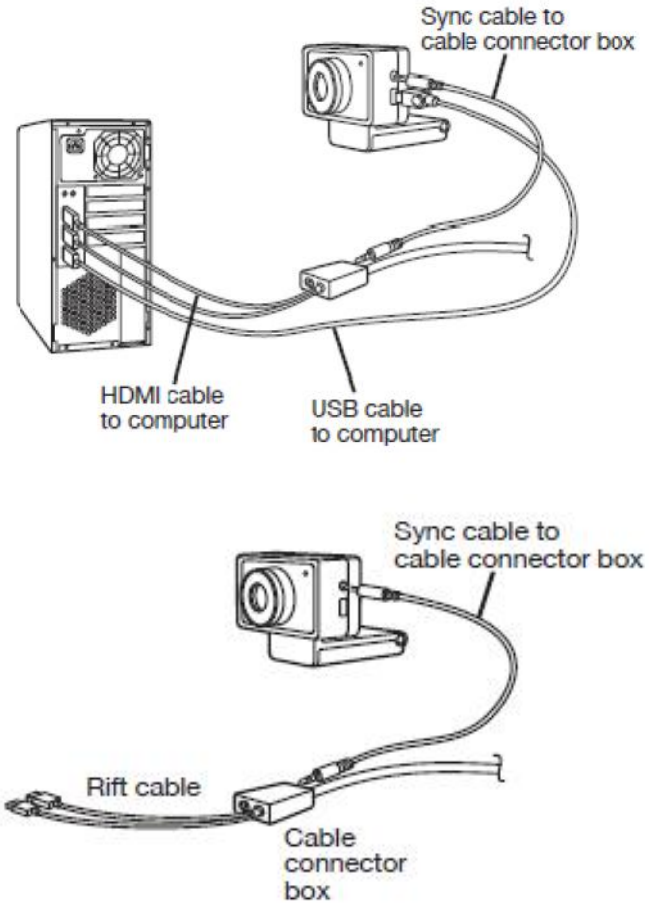


3. Connect the head set cable to the computer CPU: The head set cable has two connecters one is HDMI and the other is USB. Plug both the connectors to the computer.



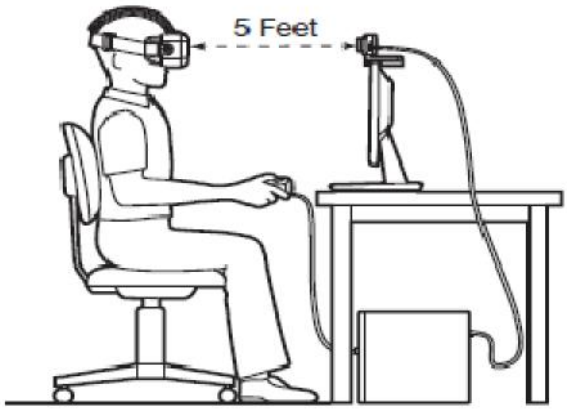
4. Connect the position tracker to the computer CPU.

- Positional tracker sync cable: Connect one sync cable to the positional tracker and another one to the head set cable.
- Positional tracker USB cable: Now connect on USB cable to the Positional tracker and another to computer CPU.

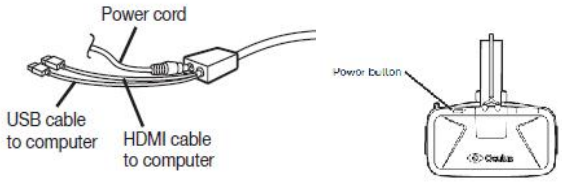


5.Position the Positional tracker to tripod or monitor.:

The position tracker lenses should be still and stable and should be in front of the capturing object. For the optimal performance the distance should be 5 feet away from the positional tracker



6.Connect the power cable to connector box, adjust the head strap and power on the oculus rift head strap.



7. Adjust the lenses and your head set and get ready for the experience.

V. Importance of head set. (What does it do?) Working

Head set: It gives you the experience of 3D virtual reality world by adjusting the head set on your head. It consists of two pair of lenses. The taller a lenses is designed for the people having moderately near sighted vision. The shorter B lenses are designed for very near sighted users. The Oculus Rift displays two screens images one for the left and another one for the right eyes and the combination are placed above the screen to create the stereoscopic 3D images. To perceive the view point depth the brain uses differences between your eyes. This phenomenon is called Binoculars vision which describes the way we see two views of the world simultaneously and each view is slightly different from each other which our brain combines to make one image which is called stereopsis. Whenever the user put on the headset its default on orange color depict that the head set is on but no video signal is there. Blue color on the screen depicts the head set is on and receiving the video signal. (Oculus Best Practices, 2016)

VI. Importance of Positional tracker

Positional tracker helps in tracking the head movement more accurately to flow the 3D movement of the character in the game in realistic manner. The data provided by these sensors helps to accurately track and portray pitch and roll of the movement character. These position trackers have sensors that track the player head movement and analyze to control the view. Rather than relying on the mouse or analogue stick to play game, the orientation of head is tracked by gyroscope which gives the rate of rotation in X, Y, Z direction.

For the optional performance the positional tracker is position about 1.5 meters of 5 feet away from the subject. The Positional tracker is attached to the tripod or to the monitor of your computer. (Oculus Best Practices, 2016)

VII. Minimum System Requirements for using Oculus Rift

- Video card NVIDIA GT*970/AMDR9, 290 or greater.
- Memory 8GB ram or greater
- CPU Intel I5, 4th generation, AMD buldozer or greater
- Video output compatible HDMI 1.3 video output.
- USB ports 2*USB 3.0 ports
- OS windows 7, 64 Bit or above.
- 500+ GB Hardisk

VIII.Application to Oculus

1.Gaming: Oculus is being widely used in the gaming industry and helped in the development of the many virtual 3D games. It gave the sense of entertainment to the people by indulging them inside the virtual world. The up coming games on oculus rift :

- Serious sam VR, The last hope
- Star Trek, Bridge crew
- Bullet Train/ World war toons

2. Social Media : As the oculus rift was designed for the gaming industry, Facebook turned to throw the support to the oculus rift announcing the new social media virtual team which aims at developing the social apps for oculus which will give the 3d environment field to the costumers. Now Facebook is selling the new 360 degree video advertising space for oculus users. Many social Advertisements and movies has been developed for the VR. Some of the Developed 360 video players are

-Total cinema 360 oculus Player
-VR Player
-Live View Rift

Simulations: stationary motion simulators are been used for many fields like aircraft simulators, astronomy simulators, medical simulators for the intensive training which uses the 3D virtual reality environment. This methodology gives the trainer new experience and better form of understanding the core concept of the equipment's and terminology. Through these simulations the complex situations made easy.

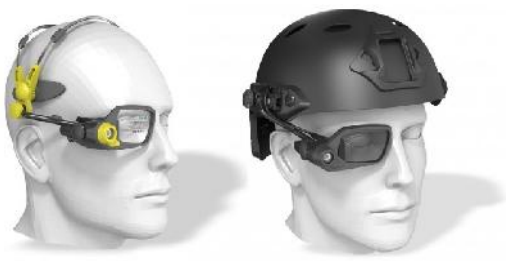
IX.Augment Reality

Augment reality aims at combining the real environment with the artificial generated computer images which is achieved by ensuring the virtual content is aligned and registered with real object. Basically AR gives more understanding additional information with the use of computer generated images in interaction with the physical world around us which gives meaning to the real objects. VR uses different simulation and prototypes technologies unlike Augment Reality focus on real object to add contextual data to it by super imposing data images to the real objects.

X.Working of AR

AR has three essential parts. (https://www.lri.fr/~mackay/pdffiles/AVI98.AugmentedReality)

1.The User (who carries the device):- Head gears or hand gears are used, the user wear or carries these devices for information gathering and projecting data into the user's field of vision in correspondent to real objects. It includes VR, helmets, goggles and data gloves. (https://www.lri.fr/~mackay/pdffiles/AVI98.AugmentedReality)



2.The device (having sensors):- This device is embedded with the objects like VR helmets, goggles or data gloves with the sensors attached to it for sensing the information of the real objects according to their geometrical relationships. These devices include sensors, Receptors, GPS, Electronic papers, Intelligent Bricks. (https://www.lri.fr/~mackay/pdffiles/ AVI98.AugmentedReality)

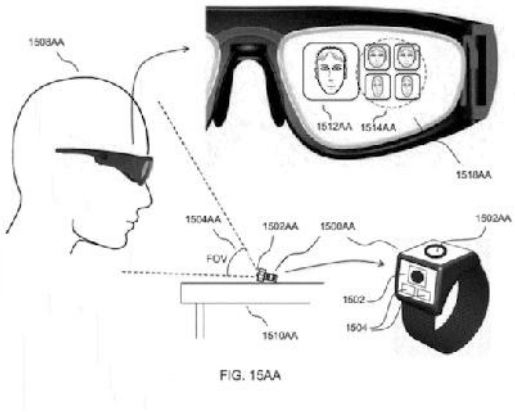
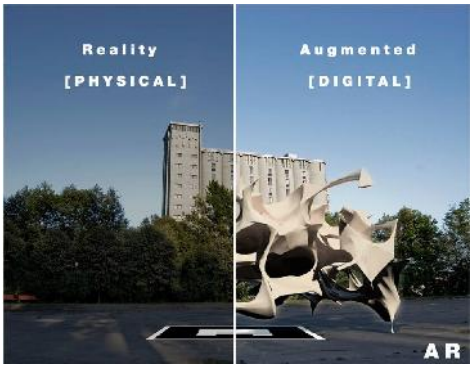


FIG. 15AA

3.Surrounding environment (objects to be captured):- The device senses the information of the object by tracking and capturing the formal geometry of object. It Displays information onto the objects and user interaction with them is done through projection of images and is recorded remotely. It includes bar code reactors, Graphic tablets, Scanners, Video games etc. (https://www.lri.fr/~mackay/pdffiles/AVI98. AugmentedReality)



XI.Application to AR

AR is been used in many field like medical imaging, frontier training sensations, video games, bar code readers, fascinating's education and trainings, ad campaigns, architectural designs. AR helps doctors to access data about patients, as it runs on interactive frame rates which superimpose the information on real time. Training simulators where pilots access the important data about the landscape they are viewing by superimposing the land marks content on the landscape makes it easy to detect right location of the object to the pilots. Sensors detection of the code through AR gives the specification and characters of the object. It is been used

XII.Virtual Reality vs Augment Reality

- VR works on the phenomenon of replacing the real world with the artificial world where as AR enhances the real life with the computer generated images
- VR creates the 3D immersive environment for the user, the user feels environments through simulations whereas AR project the data on the Captured environment.
- VR includes the Oculus headset for working might work better for video games, social networking and movies whereas AR includes the sensors glasses, head gears or Hand gears, might work better with smartphones digital projectors to display data.

XIII.Conclusion

Augmented reality focuses on learning and innovation of existing world rather than creating new ones. Its fundamental idea is to mix the real environment to the virtual environment through projection technique by gathering information and ensuring the virtual content is aligned and readjusted to the real world objects.

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