



## INTRODUCTION OF VIRTUAL REALITY

**S. Noor Mohammad<sup>[1]</sup>, B. Nagamani<sup>[2]</sup>, K. Keerthi<sup>[2]</sup>, P. Vasavi<sup>[2]</sup>, C.R. RajaShekar Reddy<sup>[2]</sup>, R. Yamuna<sup>[2]</sup>**

<sup>[1]</sup> Asst. Professor, Department of Computer Science and Engineering, Sanskrithi School of Engineering, Puttaparthi, Andhra Pradesh, India.

<sup>[2]</sup> Department of Computer Science and Engineering, Sanskrithi School of Engineering, Puttaparthi, Andhra Pradesh, India.

### ABSTRACT

Virtual Reality (VR) is a simulated visual world where people can feel immersed in a computer graphics. Practically, human who are using this technology they can feel, touching the objects, listening the sounds and walking into imaginary world, virtual reality artificially creates sensory experiences. This technology makes interaction between users and simulated environment in the real world. Users can enter the imagination world and can play the video games, experiencing the travel to anywhere by staying at one place, user can imagine their dream home and even can experiencing a walk on moon or travelling in space.

**Keywords** - Head mounted display (HMD), Tracker, Joy sticks, Suits.

### 1. INTRODUCTION

These days' people want to step into the virtual world of three-dimensional computer graphics. It becomes even possible for normal people, to move into the digital world. Virtual reality changes the way of people experience a lot of big things such as, gaming, 3D movies, learning and training etc. Virtual reality is a scientific technology of human machine interaction with simulated surrounding. Here everything is artificial but the person from real world.

This technology is becoming very popular because users can experience or controlled by movement of body. It is the creation of using interactive software and hardware.

#### VR Headset or Head Mounted Display (HMD).



**Figure.1**

By using the VR headset and sensing gloves, user can feel the environment as physical world around view of 360 degrees. VR headset also named as head mounted display (HMD). The equipment is typically able to around the artificial world and move about in it and interact with features or items that re depicted on a screen or in goggles. Virtual reality is begun in early 1950's but it came to the public attention in the late 1980's and 1990's.

## 2. HISTORY OF VIRTUAL REALITY

In 1950's cinematography vision Morton Heilig built a single user console named as Sensorama. Sensorama is a multi-sensory simulator system it provides cinematic immersive experience.



Figure.2

It featured stereo speakers, a stereoscopic 3D display, fans, smell generators and vibrating chair. Morton Heilig also created five short films by his invention sensorama, produced and edited by himself. VR provides the user watch television in 3 dimensional ways. The Sword of Damocles was invented the first VR head mounted display (HMD) system in 1968 by computer scientist Ivan Sutherland and his student Bob Sproull. Virtual Reality was popularized by Jaron Lanier in 1980's. After ten years, VR was used for education purpose, training and simulation in US military and the National Aeronautics and Space Administration (NASA). The production of VR systems started highly in early 1990's. Contemporary VR devices emerged with the introduction of PC connected Oculus Rift prototype in 2010.

## 3. TYPES OF VIRTUAL REALITY

There are three main types of Virtual reality used such as,

- **Immersive Virtual Reality**

Immersive Virtual reality is the creation of an artificial environment that replace the user's real physical world into virtual world. The goal of Immersive VR is completely Immerse the user and stepping into the computer-generated world. By using the technologies of Head Mounted Display (HMD). Immersive is nothing but a viewpoint of being physically present in a non-physical world.



**Figure. 3.1**

- **Non-Immersive Virtual Reality**

It is a type of virtual reality which a user can interact with the environment through mouse or Joystick Infront of large display but doesn't surround the user as immersive. It uses video cameras to track the image of the user in a virtual world where user can also pick up or move objects by seeing into the projector or display. By Non-Immersive virtual reality, user cannot feel any object for example video games.

**Figure. 3.2**

- **Window on World Virtual Reality**

Window on World virtual reality is a desktop-based VR which can user sees the 3D window Infront of eyes. The multiple screens are display in our real world when using the VR headset. Here the window screen visible in real world referred to as Hologram through the goggles. 3-dimensional virtual reality on regular desktop display without use of any specialized movements tracking in environment.

**Figure. 3.3**

---

## 4. DEVICES

- **Input Devices**

Input devices help users interact with virtual environment. Devices used to give the input to computers they are position trackers, Joysticks, track pads, sensing gloves, device control buttons and even full body suits.

- **Output Devices**

Output devices are Goggles in the VR headset provide visual environment, Headphones could be used to get audio and Pressure pads, Rumble pads could provide the sensation of movement.

---

## 5. APPLICATIONS

There are some applications the most used of virtual reality.

- **Healthcare**

The most important application is healthcare used in operation training. Virtual Reality facilitates an environment to learn in the real-world situations. By using VR, Doctors who needs to perform very critical operations or surgeries and students can practices. Some times doctors giving treatment for phobias also.

- **Entertainment**

The virtual reality systems available for users to get entertainment which includes simulators and 3D display platforms. The very popular entertainment in VR is video gaming and watching 3D movies.

- **Automotive**

Automotives uses virtual reality to design as a practical tool for car designer. In 3D method enable designer to create highly realistic details and integrate them into prototypes.

- **Education**

In many of schools and colleges are adopting the technology to teach the students practically. VR refers to interactive content such as videos to viewer or student. Visually teacher can teach the students.

- **Space**

By using Virtual Reality Astronauts can get explore space and training. VR presents a unique opportunity to conduct various types of practical training for space flight and even could feel spacewalk etc.

- **Military**

Every situation can be simulated and trained to the flexible. Soldiers can learn how to handle the dangerous weapons in every situation by taking the virtual training.

- **Architecture**

By collaborating with VR allows to design a building or house in 3-Dimensional view. VR is a tool for architects to be immersed in their design to construct the perfect building with required constraints. VR allows client to explore a virtual representation of a particular room, floor or whole building design.

- **Tourism**

Virtual reality can be used to capture tourism destination, places and captures every part of locations with directions to show the rout maps in a 3D view.

- **Business**

Virtual Reality is playing a major role to give presentations of new project ideas in seminars and analyzing the digital graphs such as analyzing how a product graph is increasing and decreasing virtually in digital marketing. Also, it is helpful to design the products.

## 6. ARCHITECTURE OF VIRTUAL REALITY

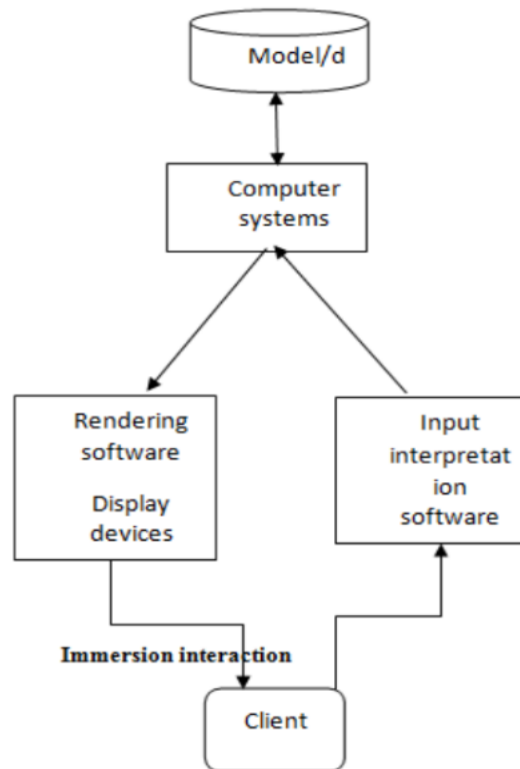


Figure. 4

Interacting with the virtual computer graphics to create a virtual environment is a factor of reality of virtual experience. Computer system must be getting the inputs from users as environment locations in 360 degrees then our physical world would be converted into virtual world by virtual reality equipment's. Here the software is a key to rendering for display the output, user can feel the scenes and experience what happening around the virtual world. This technology is very useful in our present situations to take up the worst situations and this technology will help people a lot to overcome the problems and to make complicated works easily.

## 7. WORKING PRINCIPLE

The virtual environment would be created by using the devices user interact with the virtual environment, these device acts as an interface between physical world and virtual world such as

- Tracker transmitter
- Head tracker receiver
- Head mounted display
- Headphones and Microphone
- Glove and Glove tracker receiver

The first thing by taking the input from body movements physically in the real world, then a computer creates virtual movements and gives the output by head mounted display.

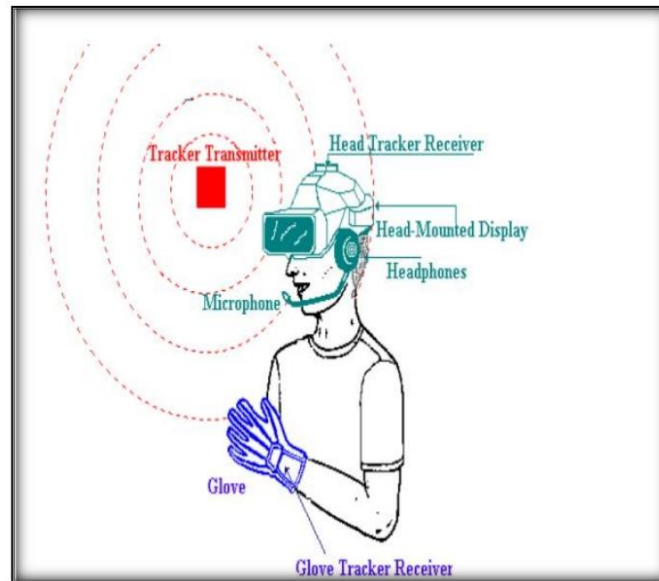


Figure. 5

---

## 8. CONCLUSION

The visualization of world by virtual reality, a large data is helpful for understanding and analysis, it offers us to interact with visual graphic world. VR gives us to experience the visual world which is impossible in real world. Virtual Reality is changing our life, eventually VR will become a part of our life. In market this technology is very high and every person can able to use this technology to explore and learn new things by stepping into the virtual world.

---

## 9. FUTURE WORK

Virtual Reality is a growing industry. PC and specialized hardware are getting better and faster because of development in VR, may be 3D user interfaces will replace the windows-based ones. Huge demand for VRML (Virtual Reality Modeling language) programmers in near future. VR revolution is increasing in gaming industries. In future the virtual reality technology will become most used technology in homes and also at work places. It would be going to available to every person.

---

## REFERENCES

- [1] Virtual Reality - History, Applications, Technology and Future Article · December 1999.
- [2] Brief Introduction of Virtual Reality & its Challenges Sharmistha Mandal, International Journal of Scientific & Engineering Research, Volume 4, Issue 4, April-2013.
- [3] Quality of Experience for a Virtual Reality simulator March 2018 Conference: Human Vision and Electronic Imaging 2018.
- [4] Virtual Reality Programs Applications in Healthcare Hassan A. Aziz, College of Arts and Sciences, Qatar University, Qatar, March 2018.
- [5] Animation VR - Interactive Controller-based Animating in Virtual Reality, Daniel Vogel, Paul Lubos, Frank Steinicke, Human-Computer Interaction, University of Hamburg, March 2018.