Brief Introduction and Application of Virtual Reality

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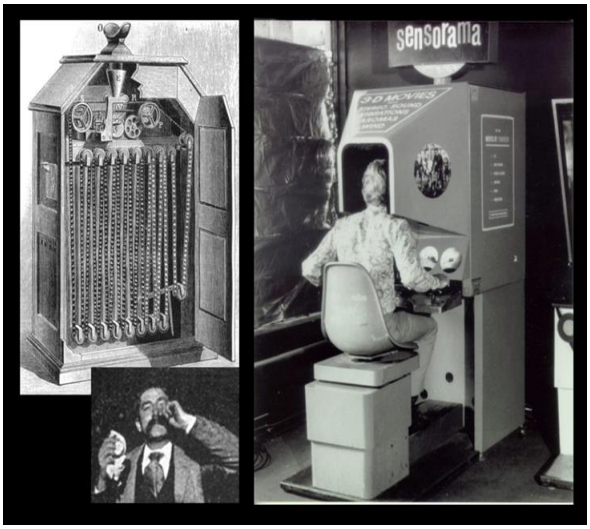
Abstract **- Virtual Reality is a technology that allows us to create a compact computer environment. Creates an immersive and interactive experience viewed with a VR headset. Current virtual reality technology uses a Virtual Reality (VR) system that features a head-up display that provides an immersive feel. It also features a sound and vibrating response.**
In this paper, an overview of virtual reality is presented, origin and futuristic applications are listed.

Index Terms **- HMD, CAVE, Application Submission History, Future Application.**

HISTORY

Theoretical speculation made during the Renaissance of Europe introduces non-existent spaces. Antonin Artaud, a French playwright, was the first to use the word "virtual reality" in his book "Theater and its Double."

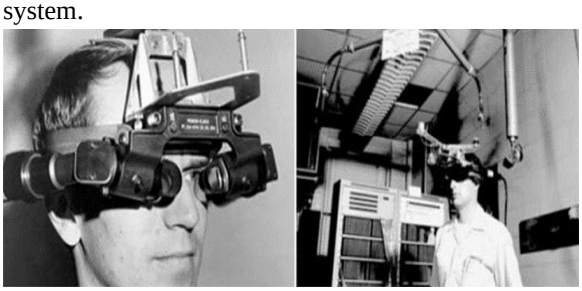


In 1962, inventor Morton Helig invented a device called Sensorama. It was based on his vision of "Experience Theater." This device has never been to production. It provided a one-seat guess using a wide range of 3D images, stereo sound, realistic scent. It has provided a wheelchair and a breath-taking feel for viewers with the immersion experience of riding a motorcycle. He also developed a device called the "Telesphere Mask" (1960).

In 1968, Ivan Sutherland, an American computer scientist, and online pioneer designed the first Head-Mounted Display with the help of Bob Sproull, Quintin Foster and Danny Cohen. It does not provide a natural interface and visuals are also not good.

Sword of Damocles: -

It was a Head-Mount exhibition with a head tracking program developed by Ivan Sutherland in 1968. Although Morton Helig has also developed a similar show program but does not have a head tracking system.



VR INDUSTRY DEVELOPMENT

1970-1990: -

During this time virtual reality expand to the defense, medical and automotive industry. Flight simulation and military training were used in defense sector. In automotive industry, various automotive design was made in VR. In medical sector various technology were introduced to facilitate the doctors and surgeons. During the period 1977 to 1984, David Em created a virtual universe that could orbit in NASA's jet propulsion laboratory. In 1978 at MIT, the Aspen movie mapped a crude journey as users roamed the streets of Aspen.

The Large Expanse Extra Perspective optical visual system was developed in 1979 by Eric Howlett. LEEP

creates a stereoscopic display with a field of view large which creates a satisfying sense of depth. This was the first-time users of the program experienced sense of depth and they are very impressed by it. This optical visual system is the basic building block of real modern headsets.

In 1988, the term virtual reality became popular. In 1985, Jaron Lanier founded a company called VPL Research which developed several Virtual Reality devices such as EyePhone, DataGlobe, and Audiosphere. In order to have an early affordable price of VR devices, the technology that was used in making the Power Glove i.e, DataGlove. VPL licensed this technology to Mattel.

1982 Atari, Inc. established a research laboratory that was closed two years later due to the crash of the 1983 video game. However, Scott Fisher, Jaron Lanier, Michael Naimark, Tom Zimmerman, and Brenda Laurel, company employees kept their research in VR. Autodesk and its Cyberspace project became the first company in 1988 to use VR on a low-configuration household computer. The project was led by Eric Gullichsen, who left the company in 1990 to find his own company, Sense8 Corporation. The company has introduced a real-time software development kit, which provided the first real-time drawing with a texture map on a personal computer.

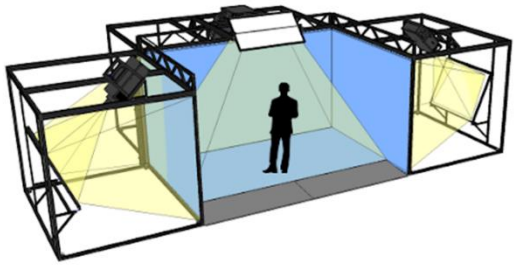
In 1988, Autodesk and its cyberspace project became the first company to use VR on low-configuration household computer. The project was spearheaded by Eric Gullichsen, who founded his company Sense8 Corporation in 1990. The company has introduced a real-time software development kit that provides real-time drawing for the first time on a personal computer with a design map.

1990 - 2000: -

In 1996, Sega released its Sega Virtual reality headset for arcade games only with mega drive consoles. The headset includes an LCD screen, stereo sound and an inverse sensor, which allows the system to track and respond to all user head movements. That same year, the Embarkadero Center called its own virtual reality game virtuality, the networked Virtual Reality entertainment program.

CAVE

In 1991, Carolina Cruz-Nira, Daniel J. Sandin, and Thomas A. The first cubic immersion chamber were called the Cave Automated Virtual Environment (CAVE) and it was built by Tom DeFanti. It has an area with many projects that allow people to see their bodies and others in the living room. The modern skybox in the game engine is promoted by a cave system to represent 360-degree simulation.



In 1992, Nicole Stanger created the first real-time immersion film, Angels, it was aided by DataGlove and High-Resolution Mirrors.

21st century: -

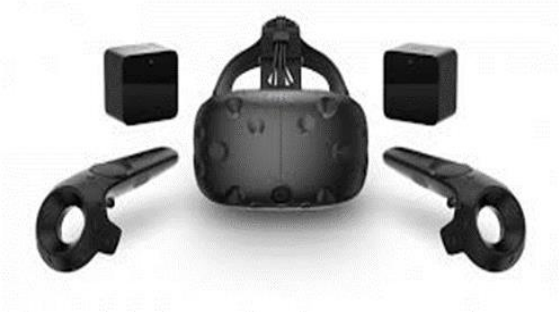
In 2001, Z-A Production launched the first room SAS Cube for a cubic based PC. The SAS library introduced the Virtools VRPack. In 2007, Google launched Street View on its map, which provides a panoramic view of world landscapes such as buildings, roads, and the countryside. Later in 2010, it introduced the 3D stereoscopic mode.

2010 - current: -

In 2010, the Oculus Rift model was designed for Palmer Luckey. It was able to follow a circular trail with 900 view fields that were not available in the consumer market. In the E3 video game trade-in 2012, the Rift was first introduced. In 2014, Facebook bought Oculus VR for the so-called $ 3 billion.

Valve, an American video game digital distribution company, developed and shared VR content

development in 2012. It was later adopted by Oculus and used in its future headsets. Subsequently, HTC and Valve announced the actual HTC Vive headset and controller in 2015.



In 2014, Project Morpheus was announced by Sony, the original headset of PlayStation 4. Project Morpheus was first announced at the 2014 Game Game Developers (GDC) conference. On March 18, 2014, SIE Worldwide Studios president Shuhei Yoshida announced the call and said "Project Morpheus was something new from the PlayStation that would build the future of the game."

All major companies such as Amazon, Apple, Facebook, Google, Microsoft, Sony, Samsung, and video game publishers like Nintendo, Atari have their own dedicated VR, AR, and MR teams.

Future Application: -

With the release of COVID-19 by 2020, VR is experiencing significant growth. According to the research of Grand View, the global VR market would grow to 62.1 billion dollars by 2027.

The application of reality has been applied to various fields, such as e-learning, architecture, and city design, marketing, engineering, robotics, entertainment, arts, health care, medical, archaeological, occupational safety, social science, and psychology.

Building and urban development: -

One of the most outstanding real-world applications is to provide a visual architectural tour. It offers design experience without having to visit that place. Many interior design companies use practical reality to better understand and thus fulfill their needs.

Natural recovery experiences: -

Studies show that natural habitats such as rivers, trees, the forest can provide relaxation. The real truth makes for a natural immersion experience for those who are deprived of access to nature. It was a matter of great concern during the COVID-19 epidemic when we would all be living in our own homes.

Health & Medical: -

Virtual Reality was initially used in Parkinson's disease, but in a 2018 review, VR was found to be ineffective. Later, Virtual reality exposure therapy (VRET) is a form of exposure therapy, used to treat anxiety disorders such as phobias and PTSD. According to research, it has been found that by combining VRET with behavioral therapy, patients experience a decrease in symptoms. Virtual Reality can provide an immersion experience for surgeons so that they can perform complex tasks without actually doing them.

Virtual reality was first used in Parkinson's disease, but in the 2018 review, VR was found to be useless. Later, Virtual Reality Exposure Therapy (VRET) a form of exposure therapy is used to treat anxiety disorders such as post-traumatic stress disorder (PTSD) and phobias. According to research, by combining VRET with behavioral therapy, patients experience a reduction in symptoms. Virtual reality provides surgeons with an immersion experience so that they can do complex tasks without having to do them.

Digital marketing: -

The real truth opens up a new marketing window. It provides a product experience without being the owner of it. Many companies like IKEA, The Outdoor Niche, Toms Shoes, etc. use real reality to advertise their product. Companies like IKEA show furniture using AR.

EDUCATION AND TRAINING

The Future of Science Education

The real truth has the power to transform the education sector. It can help students better understand concepts without the realities of the world. With the help of Virtual Reality, we can provide better education in remote parts of the world.

Defense, aerospace, and firefighting training personnel are using it to simplify their training. Virtual can make training as realistic as possible without the effects of the real world.

Currently, thousands of universities across world utilize this VR-driven technology. It engages and inspires students to pursue programs in the sciences. As it comes with a progress tracker, it enables students to take full control of their learning. In addition, it prepares future generations for the real world.

For example a company that's developing immersive lab simulations is PraxiLabs. The company designs virtual labs for biology, chemistry, and physics classes, where students can perform all kinds of experiments safely. They create enriching experiences that fit various learning styles. Not only that, but they also provide study aids that come in different multimedia formats to help students excel.

Labster is one platform that's seeking to enhance science education. It gives students access to hyper-realistic lab equipment. Furthermore, it allows them to perform experiments in a risk-free simulated environment.

Science holds myriads of theories and concepts within it. But most of these theories and concepts are very abstract in nature. This kind of content can lead students to become easily bored and disinterest. VR technology helps student to explore every part of science with keeping their interest and focus intect.

ENTERTAINMENT

Virtual reality is the future of entertainment, as it offers a better immersion experience whether in movies or video games.

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Through this research paper I have learnt a lot about the Virtual reality and its application. It has helping me understanding the possibilities of virtual reality.

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