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A Brief Study on Virtual Reality

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Abstract: Virtual reality (VR) is a technology that allows computers to interact with a simulated environment, whether the environment is a simulation of the real world or a fictional world. It is important to experience, feel and touch the past. And the future. It is a medium for creating our own world, our own personal reality. Virtual reality is an implementation technology, which has various applications in training and product design. Virtual reality (VR) technology is used to solve problems in the real world. The National Aeronautics and Space Administration (NASA) is using VR to train astronauts to customize the Hubble Space Telescope. Exploring the intelligence of traditional VR systems and understanding the challenges of virtual reality.

I. INTRODUCTION

Nowadays, virtual reality (VR) technology has been used in developed areas Medical, engineering, education, design, training, and hobbies. VR is a computer interface designed to simulate the world beyond a flat panel display and provide a 3D (three-dimensional) visual experience. It is often difficult to reconfigure the size and spacing between objects in standard 2D drawings. Hence, the third dimension helps to bring depth into objects

II. WHAT IS VR?

The development of the virtual reality industry began in the early 1990s

The term virtual reality is very popular. We have heard of virtual reality in almost all types of media, and people use this term frequently and misuse it on many occasions. Virtual reality is like imagination There is much more to the (virtual) world than the real world. The world of fiction is a simulation that runs on a computer. Consciousness data is sent to our brain through certain systems. VR allows users to interact with computer simulation environments, both real and fictional. Virtual reality is a term used to describe a computer-generated virtual environment that users can move and manipulate in real time. Head-mounted displays can be displayed on a computer monitor or large project screens. Head and hand tracking systems are used to assist users in monitoring, moving, and manipulating virtual environments. VR has developed to a new stage and has become a unique field in the world of computing. The use of VR has been studied in automobile design, robotic design, medicine, chemistry, biology, education, and architectural and construction design.

A. Immersed VR features

- 1) The characteristics of immersed virtual reality are as follows:
- 2) Reference provides a natural interface for navigating the main reference display
- 3) The space is three-dimensional and allows for the ability to view, walk and fly in a virtual environment.
- 4) Air stereoscopic display enhances room perception and sense of space.
- 5) The virtual world is fully presented and has a good relationship with human dimensions.
- 6) Enable real-time interactions with virtual objects through Glo data gloves and similar devices to enable the desired movement, operation, and control of the virtual world.
- 7) The reliable illusion of being completely immersed in the artificial world can be enhanced by other auditory, haptic and non-visual technologies.

III. VIRTUAL REALITY DISPLAY

There are four main coefficients for immersion in virtual reality, namely:

A. Visual Display

It will be difficult for users to know "there" if they can't see anything with their eyes. So most virtual reality systems focus on visual display. Visual immersion has several components including:

- 1) *View Field (FOV)*: The size of the visual field that can be seen instantly (degrees from the visual angle)
- 2) *View Field (FOR)*: The total size of the visual field (in degrees of visual angle) around the user.
- 3) *Inch pixels Per Inch (PPI)*: Measurement of pixel density (resolution).

For example, to display 24 frames per second on a TV with a refresh rate of 120 Hz, each frame is repeated 5 times every 24 seconds.

To render a realistic environment, virtual reality systems are able to track the position and rotation of the user's head to render images according to the user's eye view.

B. Audio Display

An easy way is for the listener to pay attention to a place, something, something is happening or will happen in a virtual environment. Despite the lack of visual presentation quality, high sound quality can help create a compelling experience. One advantage of looking at 3-D sound is that the virtual sound source could not get anywhere in the 360 degree space around the listener. Audio immersion has several components, including:

3D localization: the virtual reality system must be able to track the listener's position and turns; For example, as the listener moves closer to the sound source and the sound should be heard from the same place in a virtual environment, that sound should be amplified.

Method of sound distribution: different audio channels 2, 2.1, 5.1 and. Will give a different sound taste like 7.1 channel or headphones.

Variety of Eri: Sound repetition and repetition can be found and considered unreal. Creating sound without repeating the speed noticed by the listener will increase immersion in virtual reality systems.

C. Haptic Display

The haptic screen is a device that stimulates the user's sense of touch. Currently, the most widely used haptic devices are cell phones. Over the past few decades, more and more haptic exhibitions have appeared, combining with new developments

Control strategies in acting and sensing technology, mechanical design and parallelism. Various information is represented by haptic displays, among others, texture, temperature, shape, viscosity, friction, deformation, inertia and surface properties of an object in a virtual environment. In addition, the haptic display allows the user to distinguish between hard and soft tissues, which are extremely important in medical surgical applications.

D. Vestibular Display

The vestibular senses maintain balance. The vestibular display allows humans to feel balance, acceleration, and orientation in terms of gravity in a virtual environment. There is a strong correlation between the visual and vestibular systems. Anomalies in the vestibular and visual systems can cause nausea and motion sickness. Vestibular views are common in flight and driving simulation systems.

IV. CONCLUSION AND FUTURE WORK

Knowledge education training is great as students work together with previously developed VR applications and develop their own virtual world to research, understand and demonstrate their knowledge of certain focus materials.

The focus of this work is on the use of virtual learning environments in education with as many designs as possible and a comparative analysis of designs based on some key features. Fully integrated VR systems at the computational power and technology level are the most challenging, thereby providing the costs required to achieve acceptable practicality and continuous improvement in the advancement of technology. The key areas of inquiry and development include resolution versus. View trade-offs, reduce HMD weight and size, and disable the system. Virtual reality is the most effective way to bring safe, cost-effective, flexible and flexible knowledge to traditional teaching improvements. Highlights an overview of current virtual technologies in education.

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