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VIRTUAL REALITY

ABSTRACT

Virtual reality is the environment that applies to computer-simulated environments that can simulate physical presence in places in the real world, as well as in imaginary worlds. It contains a wealth of information about virtual reality which is designed for the newcomer and experienced technologist alike. It discusses all aspects of virtual reality which includes concepts of virtual reality, technologies used, applications and ethical issues. Virtual reality is a form of technology which creates computer generated worlds or immersive environments which people can explore and in many cases, interact with. Virtual reality has its advocates and opponents which are mainly due to a lack of understanding about this technology and its capabilities. Unrealistic expectations coupled with lack of awareness regarding technical limitations means that for many people, virtual reality is difficult to grasp or even take seriously.

Virtual Reality

Virtual reality is the concept of using technology to allow users to interact with a computer-generated environment for entertainment, education, training and design. Ideally, a computer simulates an environment that is complete with physics, simulated objects, sights and sounds, and then outputs that environment into the senses of the user. Modern technology has yet to live up to this ideal, and currently most virtual reality technology is limited to sight, sound and touch. Virtual reality has been popularized through several movies, books and video games, which have sometimes distorted the nature of the technology.

History

Though the term has its roots in fiction and theatre, virtual reality as a technology began in the 1950s with the Sensorama, developed by Morton Heilig and conceived as a theatre that would address all senses. In 1968, Ivan Sutherland developed the first head-mounted display (HMD), which, with the aid of early wire-frame graphics, allowed users to perceive themselves as being inside a virtual environment. Films like "Tron," television series like "Star Trek: The Next Generation" and books like William Gibson's "Neuromancer" served to popularize the notion, and early versions of the technology have been used in amusement parks, for historical recreations and in video games. While the technology has progressed a great deal, modern virtual reality devices are generally limited to head-mounted displays combined with headphones and gloves that allow for sensation and manipulation of virtual objects through force-feedback and motion-sensor technologies.

Benefits

Virtual reality has many potential uses because it appeals to our intuitive use of information. In education it can allow for the creation of full environments that would present the experience of hands-on study without needing to leave the classroom. In medicine it can allow students and researchers to treat virtual patients as training and, in combination with advanced robotics, perform surgery at a distance. Engineers can create, modify and test designs in a virtual space, and soldiers can train in virtual war zones. Psychologists and therapists may also utilize virtual reality for treatment purposes, especially in the treatment of trauma disorders.

Theories

Theories on the future and nature of virtual reality include the notion of the integration of the Internet and virtual reality for purposes of communication and data management and the idea of the creation of perfect virtual worlds. Advances in technology are expected to bring about more realistic simulations and possibly a way of feeding sensory data directly into the brain. A competing idea called "ubiquitous computing" reverses the classical notion of virtual reality, bringing the functions of computers into everyday reality, and some theorists speculate that the final result will be some integration of the two. In a variation on the "brain in a vat problem," philosophers have put forward the interesting argument that, should complete simulated realities be possible, then it is possible that they have already been designed and that we are currently in one.

Misconceptions

Because of the popular use of virtual reality in movies, novels and games, there are often misunderstandings about how virtual reality functions and what it entails. For example, there is no reason why being injured in virtual reality should result in injury to the physical body, why electrical hazards would somehow cause you to magically be stuck in a virtual world or exchange places with a virtual entity, or why a virtual entity could somehow manifest itself in physical reality.

Concerns

The primary concern associated with virtual reality is the worry that, given the ability to make simulated realities, humans will choose to live in those realities and ignore this one. Another worry is that virtual reality technology could be used to manipulate and control people by convincing them of false realities or conditioning them by using simulated experiences.

Uses of Virtual Reality

The uses of virtual reality are immense. The technology can be utilized to allow many different occupations and sciences to teach processes and perform better quality research using digital imaging. Virtual reality can be implemented in nearly any form, using computerized data, charting and modelling to build or predict certain outcomes.

Advantages & Disadvantages of Virtual Reality

Virtual reality is no longer a fever dream of the tech obsessed. The idea of being immersed in a reality that is created and not natural has been the goal of many computer programmers and scientists over the years. With VR finally becoming a reality, though, there are both benefits and drawbacks to the technology.

Disadvantages

The disadvantages of VR are numerous. The hardware needed to create a fully immersed VR experience is still cost prohibitive. The technology for such an experience is still new and experimental. VR is becoming much more commonplace but programmers are still grappling with how to interact with virtual environments. The idea of escapism is common place among those that use VR environments and people often live in the virtual world instead of dealing with the real one. This happens even in the low quality and fairly hard to use VR environments that are online right now. One worry is that as VR environments become much higher quality and immersive, they will become attractive to those wishing to escape real life. Another concern is VR training. Training with a VR environment does not have the same consequences as training and working in the real world. This means that even if someone does well with simulated tasks in a VR environment, that person might not do well in the real world.

Advantages

Although the disadvantages of VR are numerous, so are the advantages. Many different fields can use VR as a way to train students without actually putting anyone in harm's way. This includes the fields of medicine, law enforcement, architecture and aviation. VR also helps those that can't get out of the house experience a much fuller life. These patients can explore the world through virtual environments like Second Life, a VR community on the Internet, exploring virtual cities as well as more fanciful environments like J.R.R. Tolkien's Middle Earth. VR also helps patients recover from

stroke and other injuries. Doctors are using VR to help re teach muscle movement such as walking and grabbing as well as smaller physical movements such as pointing. The doctors use the malleable computerized environments to increase or decrease the motion needed to grab or move an object. This also helps record exactly how quickly a patient is learning and recovering.

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