VIRTUAL REALITY

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Abstract: Virtual Reality (VR) is a well-known concept and has been proven to be beneficial in various areas such as entertainment, research, military training, medical training, etc. Also, many applications using VR technology in education have been reported. However, several disadvantages inherent in VR prevent its broad deployment in educational areas. These limitations include non-realistic representation, lack of customizability and flexibility,financial feasibility, users' physical and psychological discomforts, simulator sickness, etc. In addition, the development of a Virtual Enviroment (VE) (including virtual space (VS), virtual models and avatars) that is suitable for educational usage could itself be troublesome. For example, creating a VS by surveying the real world with traditional measuring tools or creating virtual features with CAD software involves many steps and thus is time-consuming and complicated. The traditional data acquisition (DAQ) systems used in educational laboratories tend to be expensive, difficult to be set up and maintained. Using conventional keyboard and mouse as input devices for VR applications could be unnatural sometime, while novel immersive VR devices such as 3-D glasses, motion-tracking gloves and haptic sensors are too expensive for educational institutions.

In this paper, an innovative method that uses the Microsoft Kinect as an essential component for developing game-based VR educational laboratories is presented. This technique includes three different aspects. First, it is an efficient method for creating the VE, the Kinect is used as a measuring tool for scanning the real laboratory scene and the real objects contained in it. The acquired data then form the basis forcreating the 3-D VE. Second, the Kinect is employed as a substitute DAQ system for acquiring range data and tracking the objects' motion. The acquired results are then used to animate the experiment inside the VR environment. At last, the Kinect is used as a novel human-computer interface for tracking the users' entire body motion and recognizing their voices. The results from the motion tracking and voice recognition serve as commands for navigating inside the VR environment. Using the method described here, three major aspects of educational VR development can be accomplished with an inexpensive and commercially available Kinect.

Introduction:

Today the Virtual reality (VR) technology is applied to advance fields of medicine, engineering, education, design, training and entertainment. VR is a computer interfaces which tries to mimic real world beyond the flat monitor to give an immersive 3D (Three Dimension) visual experience. Often it is hard to reconstruct the scales and distances between objects in static 2D images. Thus the third dimension helps bringing depth to objects.

Definition - What does Virtual Reality mean?

Virtual reality refers to computer-generated environments or realities that are designed to simulate a person's physical presence in a specific environment that is designed to feel real. The purpose of VR is to allow a person to experience and manipulate the environment as if it were the real world. The best virtual realities are able to immerse the user completely. Virtual reality should not be confused with simple 3-D environments like those found in computer games, where you get to experience and manipulate the environment through an avatar, rather than personally becoming part of the virtual world.

Briefly explanation of virtual reality :

There is no concrete definition of what a virtual reality experience entails, so opinions differ depending on the field in question and the mode used to achieve virtual reality. That said, virtual reality does follow a few accepted guidelines.The environment must be made up of images that appear life-sized according to the perspective of the user/viewer unless the desired effect deviates from this.The system responsible for running the virtual environment must be able to track the user's motions, especially the eye and head movements, so that it can react and change the images on the display or initiate any related events.In order to immerse the user fully, Jonathan Steuer, a Ph.D. in communication theory and research, proposed two components.Depth of Information: Refers to the quality and amount of data the user is by the virtual environment itself. This could be achieved through the display resolution, graphics quality and complexity of the environment, sound quality, haptic feedback and the like.Breadth of Information: Refers to how many senses are being stimulated by the virtual environment. The most basic of these should be audio and visual, while the most advanced systems should include stimulation of all five senses in order to enhance immersion.

Why Virtual Reality Is About to Change the World
For each VR demo, I put on a clunky pair of goggles, most of which have a smartphone slipped into a slot in front of my eyes, which does most of the work. These machines are not as complex as what Luckey developed, but they provide a cheap, effective rendition. The screen, when it's that close to your face, fills your field of vision--the first frameless visual medium. The sense of depth is far more realistic than 3-D, with everything stretching out to infinity, scaled perfectly. And I can look all around, whipping my head to see above, below and behind me, which gives me brief moments of what virtual-reality pioneers longingly call "presence"--when you really feel like you're inside a fake environment. It's an amazing technical achievement. I'm psyched I got to try it, but it's not something I'm going to choose over watching TV. The graphics are clunky, and I can see individual pixels, so I'm pretty far from fooled into thinking I'm not inside a ballpark. It's like the coolest version of the 1970s View-Master toy I could imagine.

Facebook expected to launch standalone VR headset
Johannesburg - Social network Facebook reportedly may make a bigger push toward Virtual Reality by launching its own standalone VR headset at its developer conference in May. According to a Variety exclusive, the world's biggest social media platform will officially launch its Oculus Go headset at its f8 developer conference on May 1. The annual developer conference showcases Facebook's latest technology and gives users a glimpse into what's next for the platform. F8 is expected to be held at the McEnery Convention Centre in San Jose, California, on May 1 and 2, and is intended for developers and entrepreneurs who build third-party products and services around the social network.The Oculus Go is a VR headset with no PC or wires attached and pricing is expected to start at $199, according to its website.

A Brief History of VR Games
Today, virtual reality gaming is taking off at a good pace with PC, mobile, and PlayStation headsets helping grow the market and provide gamers with deeper, more immersive experiences than any previous generation. But it has been a long time getting here, as Chris Knight explains in this look at the history of VR games.

Virtual reality has been around since the sixties as a concept, with some early hardware designs not far off what we use today, even if the silicon and screen technology were prehistoric. Evans and Sutherland were among the early innovators, providing the first modern simulators for the US military, using digital projectors and pioneering 3D graphics work.
E&S also provided gaming hardware companies with their tech for texturing and 3D polygons, helping boost gaming. Since then, developers have been trying to push it in to the consumer space.

The lack of consumer-grade processing power and heavy screen technology, however, has made for a long and painful journey. VR first came to consumer attention in arcades in the late-1980s.

One of the first efforts was a Harrier jump-jet flight simulator called VTOL by VR gaming pioneer Virtuality. Running on some exotic hardware (a TMS 34020 graphic processor with TMS 34082 co-processor) in a big grey sit-down unit, people queued for ages to try it out.

By Catherine de Lange

A VIRTUAL reality headset has restored sight to people who are legally blind. While it didn't cure the physical cause of their blindness, the device let people with severe macular degeneration resume activities like reading and gardening – tasks they previously found impossible.Macular degeneration is a common, age-related condition. It affects around 11 million people in the US and around 600,000 people in the UK. Damage to blood vessels causes the central part of the eye, called the macula, to degrade. This leaves …

Get familiar with New age VR

It has been years since researchers around the world have been contributing to fundamental research into 3D user interfaces and virtual reality (VR) applications, improvising on technology, as well as exploring possibilities of VR interaction in various fields.The research in the field of virtual reality and 3D interaction offers a broad spectrum with many foundations that have their origins mostly in the 80s and 90s. Even decades ago, VR hardware was very rare, expensive and complex. As a result, VR was primarily used for military or industrial research.Today, Virtual Reality (VR) is well on its way to changing the way we enjoy entertainment, interact with friends, and do our job. Companies pioneering in visual computing, is at the forefront of this exciting platform. From gaming to product design, cinema enjoyment and beyond, breakthroughs are being delivered through VR solutions.To better support developers and designers of applications specific to virtual reality, many industry and science professionals are already working on VR design guidelines. However, these are usually rather isolated solutions and very general.

SONY PLAYSTATION VR :
The PlayStation VR, known by the codename Project Morpheus during development, is a virtual reality headset developed by Sony Interactive Entertainment, which was released in October 2016. It was designed to be fully functional with the PlayStation 4 home video game console.

But even removing sales from the equation, the PlayStation VR has become a game-changing piece of hardware in more ways than one. We're confident that over time Sony will continue to boost its VR (and possibly even AR) offerings over the coming years, and the rumors are that a Playstation VR 2 isn't far away.
The word on the Sony street is that the PSVR 2 will tie into the PlayStation 5 release as the headset could take advantage of the new console's upgraded hardware. As for the headset itself, it's possible it could house an ultra-high resolution display manufactured that boasts 1,001 pixels per inch. Fingers crossed.

Virtual Reality Companies Leading the Way :
Google
Google started out in VR with a $15 headset made of cardboard called, what else, Google Cardboard. Cardboard is designed specifically for using VR apps on Android smartphones. It has since come out with a sturdier headset called Google Daydream View, which is similar to Google Cardboard in concept and will run you $79. You still put your phone in the headset and it functions as your display. The headset is primarily a pair of lenses that separate the screen into two images.
Samsung Gear VR
Samsung's Gear VR was designed with Oculus as a consumer device for $199, and it works just with the newest generation of Samsung phones. In fact, you slide a Samsung phone into the headset holder and it acts as the compute device. The headset is meant for consumers and the only apps on it so far are games from third-tier developers.
Microsoft HoloLens
Microsoft's virtual reality headset is still in development but already expanding to include mixed reality, or augmented reality, where virtual images are superimposed over real world objects. While HoloLens is still in development, Microsoft is showcasing an increasing number of both games and practical applications for the headset, such as architectural engineering and CAD design.

AMD

AMD's graphics business has been far more successful than its CPU business, although that is finally coming around. Its Radeon RX 480 is a VR-capable card for just $199, much cheaper than the competition. Also, AMD continues to supply chips to console makers Nintendo, Microsoft, and Sony, and Microsoft and Sony have both announced plans for VR powered consoles.

Nvidia

Besides being the leading GPU maker, Nvidia is a now VR company – it offers VRWorks, a developer suite for building all kinds of VR apps. VRWorks helps developers create high resolution imagery with lower latency and provide more realistic imaging and quicker adjustments of the images when the user moves their head.

Conclusion :

A society in which the ability to access virtual reality was hindered by the pressing supporters of the anti-VR movement, would be a tremendous downfall and a signal to our own ignorance in times of technological advancement. Virtual Reality is arguably the next footstep towards a modern/post-modern era of development. The potential ground breaking effects that loom behind these machines is uncanny. With the ability to save lives, act as a medium for business development and confrontations, and provide its users with endless hours of entertainment, learning, and discovery, the world should be pushing for an increased presence of this product, just the same as it did in the 1990's. This time around, our technology will have come far enough to support the needs for these devices and will begin implementing virtual reality within homes, medical centers, and offices.