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Ar: Augmented Reality/Revolution

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Abstract

This paper presents a peephole of the revolutionizing technology Augmented Reality (AR). In today's fast pace life, how this technology is creating a valuable space for itself and escorting us to the ultimate that we can achieve with this. AR is not just a technology but it's a tool of the time that is making such a big umbrella stature that many of the traditional technologies falls as a small part to this technology. Its not the time that's stopping us to see the reality hinder by the augmented version of it. Here we are trying to present some important uncharted areas where this technology can be the nightingale and can provide some serious advancement.

Keywords: *augmented reality, valuable space, tool of the time, handling.*

I. INTRODUCTION

Augmented Reality is the way of portraying the reality the way we want. It can mold the vision of several individuals and can bend the reality towards our vision. It uses computer tools and many advance technologies to provide a subtle but believable form of reality.

What is exactly Augmented Reality?

Augmented Reality overlays are the computer graphics on the real world and make uses of various computer technologies like sound and computer vision to provide augmented way of reality.

As stated by Wikipedia "Augmented reality (AR) is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory and olfactory. AR can be defined as a system that fulfills three basic features: a combination of real and virtual worlds, real-time interaction, and accurate 3D registration of virtual and real objects. The overlaid sensory information can be constructive (i.e. additive to the natural environment), or destructive (i.e. masking of the natural environment). This experience is seamlessly interwoven with the physical world such that it is perceived as an immersive aspect of the real environment. In this way, augmented reality alters one's ongoing perception of a real-world environment, whereas virtual reality completely replaces the user's real-world environment with a simulated one. Augmented reality is related to two largely synonymous terms: mixed reality and computer-mediated reality."

Today many industries are flying enormously high by integrating AR as an important part of their work. Many wants to shift towards this revolutionizing curve and some are still searching for a place to make their contribution in this technology.

This technology is bounded by any regulations as the vision is the only bound here as much as we can imagine this technology got the potential to deliver.

How this is different from Virtual Reality?

This AR concept must not be mixed with the concept of Virtual Reality which deals with the virtual information for working. In Augmented reality we behave as the part of the 'real' environment and tend to provide a layer of computer advancements on that 'real' layer.

On the other hand, Virtual Reality creates a whole new 'reel' world which is considered as reality and then we interact there. Both the technologies have their own usage and benefits.

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In simple words, the main aim of the AR is to work on the real environment and for VR is to create a reel environment to provide virtual interaction.

AR is more towards Mixed Reality than Virtual Reality.

OBJECTIVES OF THE STUDY

- To provide information about Augmented Reality
- To show various fields where this technology can prove its metal.

II. TECHNOLOGIES USED IN AR

a. Scene Generator

The scene generator is a group of devices or software that are responsible for rendering the scene. Rendering is not a major problem in today's world in AR, because a few virtual objects need to be placed, and they often do not necessarily have to be realistically rendered in order to complete the purposes of the application.

Scene generator basically generates the real environment and provides a means for the user to interact with this environment. Consider a room is needed to be decorate then we can use scene generator to generate an augmented version of the room where we can make the changes virtually.

b. Tracking System

The tracking system is one of the biggest problems on AR systems mostly because of the registration issue. The alignment of the objects in real world and virtual world must be done precisely, if not then the illusion that the two worlds coexist will be compromised. For the industry, many applications demand accurate registration, especially on medical systems.

c. Display

Display plays a really important role in AR world. Better we provide the display more realistic the illusion of the virtual overlay will work. Today many advance tools and technologies are coming forward for the display.

The best examples can be the development in the TV industry, Apple released its 6K panel which has the capability to render and play videos in 6K version.

Today we can achieve mixed reality and display it using different technologies. Previously used technologies like HMD (Head mounted displays) evolved to smart glassed like google lenses.

This technology has brought a revolution in IT industry, which is just a beginning.

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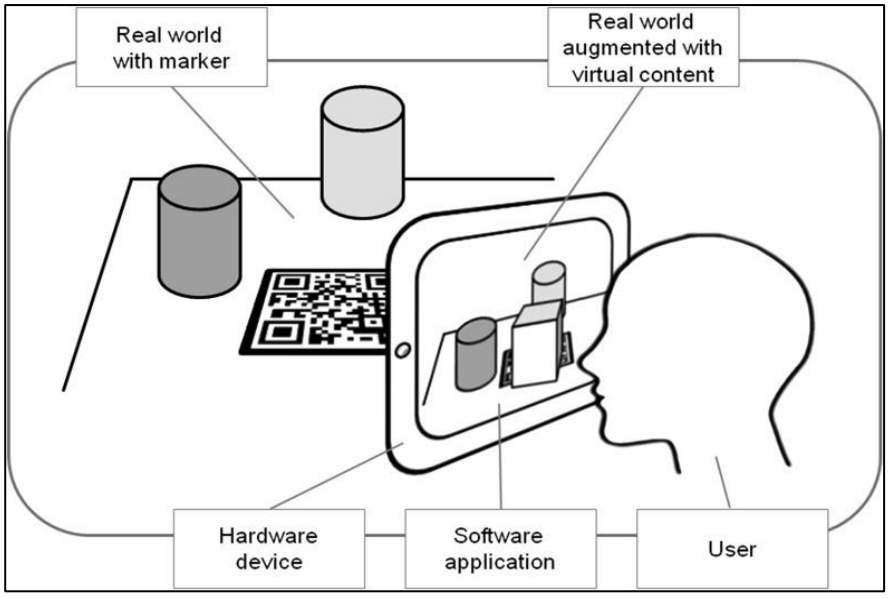
III. AR in EDUCATION



- Using augmented reality in the classroom can turn an ordinary class into an engaging experience. AR

technology provides virtual examples and adds gaming elements to support textbook materials. As a result, classes become more interactive. AR helps students better remember the information they've just learned. Let's review a few examples of augmented reality in classroom education. Badges –Paleontology. Dinosaur 4D+ is an AR app and a set of flashcards. Users can scan flashcards to see 3D dinosaurs. With Dinosaur 4D+, students can see dinosaurs in action, rotate them, and zoom in and out. The app also gives some information about each dinosaur.

- Augmented Reality can transform the todays face of medical education and can improve the reachability and can make the government to make this field cost effective.

- Visualizing human anatomical structure with AR -

Understanding human anatomy is essential for practicing medicine since anatomical knowledge supports the formulation of a diagnosis and communication of that diagnosis to patient and friends. Anatomy education is traditionally done by the dissection of corpse. 'Anatomical dissection is the systematic exploration of a preserved human corpse by the sequential division of tissue layers and the liberation of certain structures by removal of the regional fat and connective tissue with the aim of supporting the learning of gross anatomy by visual and tactile experience'. The value of dissection classes as a teaching format lies in the fact that it provides a 3D view on human anatomy including tactile learning experiences. It enables elaboration of knowledge already acquired in lectures and study books and it provides an overall perspective of anatomical structures and their mutual relations in a whole organism.

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This training format is, however, quite costly. And so far, no objective empirical evidence exists concerning the effectiveness of dissection classes for learning anatomy.

AR technology could offer an additional teaching method for anatomy education, depending on how it is implemented. Strong points are the visualization capabilities including the 3D rendering of anatomical imagery. Other sensory experiences could be implemented as well, such as tactile feedback. AR provides real-time manipulation of these visualizations and direct feedback to students. With that, AR technology could comply with some of the affordances of traditional dissection classes.

IV. AR in ENTERTAINMENT

Games –

Augmented reality is the integration of game visual and audio content with a user environment in real time, unlike virtual reality which creates completely an artificial environment. Augmented reality in the gaming industry uses the existing environment and creates a playing field within it. AR games can be played on smartphones, tablets, and portable gaming system. It is the integration of digital information and overlays new information on top of it.

The first commercial application of AR technology was the yellow “first down” line that began appearing the football games in 1998.

AR technology in the gaming industry provides with an interactive experience of a real-world environment where the objects that reside in the real world are augmented. This revolutionary technology makes a greater impact on gaming while covering other industries like healthcare, e-commerce, retail, marketing, education, military, automotive and much more. This advanced technology is rapidly changing the way the gaming industry works and contributing a lot towards it.

Example – we can consider the biggest and most famous game Pokemon Go which created so much buzz and got about 1 Billion users. This game showed us what the potential of Augmented Reality is and how it can change the things if used perfectly.

Movies –

AR can change the way we see the movie industry today. Thought about a livable movie with all the characters augmented in the surrounding and interacting with them.

V. AR in PRESERVING OUR HERITAGE

We all know that our heritage needs to be preserved and it’s the prime job of the government to take a good care of our Heritage. For example, take Taj Mahal that is one of the seven wonders in the world it needs time to time restoration and daily pollution is hampering its beauty. We can use AR technology to provide better way of restoration for this building and that can help us to save many structures with historic importance.

VI. AR IN MILITARY TRAINING

AR technology is used heavily in military and air force training, as we cannot directly provide such valuable machines directly for training as it will not just cost too much but it can endanger many lives.
All the crucial information (spatial orientation data, weapons targeting, etc.) is being superimposed onto the pilot’s visor, so they do not have to look down at their panels all the time and have much better situational awareness.

Something like that has been developed by the U.S. Army Research, Development and Engineering Command’s Communications-Electronics Research, Development and Engineering Center (CERDEC) that are actively researching the potential of augmented reality technology.

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TAR looks like the night-vision goggles (NVG), but it can offer much more possibilities. It can show a soldier their exact location, and the positions of the allied and enemy forces.
The system is mounted to the helmet the same way the goggles are and can operate during both night and day. So, TAR basically replaces the typical handheld GPS device and goggles. As a result, a soldier would not have to look down whenever they want to check their GPS location.
Moreover, there is a thermal site on the weapon that is wirelessly connected to the tactical augmented reality eyepiece and a tablet on the soldier's waist. Such a system allows soldiers to see the target they're aiming at and the distance to it.
Also, the display can be split in two so that you can see where your gun is pointing at and the view from

your frontal camera mounted on the helmet at the same time. For instance, a soldier can see around a corner or over the wall without any risk of getting a headshot.
The overall goal of the Battlefield Augmented Reality System (BARS) was to do for the dismounted war fighter what the Super Cockpit and its successors had done for the pilot. Initial funding came from the Office of Naval Research. The challenges associated with urban environments were a particular concern: complex 3D environment, dynamic situation, and loss of line-of-sight contact of team members. Unambiguously referencing landmarks in the terrain and integrating unmanned systems into an operation can also be difficult for distributed users. All of these examples show the impairment of situation awareness (SA) military operations in urban terrain (MOUT). The belief was that the equivalent of a head-up display would help solve these. By networking the mobile users together and with a command center, BARS could assist a dispersed team in establishing collaborative situation awareness.

VII. CONCLUSION

This revolutionary technology has just started its way towards the new world full of augmented parts. Let's understand this technology and find some uncharted area where this tech can make wonders. This was just a brief introduction with some areas where this tech is playing a crucial part lets find some more and share.

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