AUGMENTED REALITY-AN ALTERNATE LIVING

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Abstract
Report based on Augmented Reality strategy, a systematic discipline which can be applied to practical life improving each of the industrial productive life. A brief conception on how augmented reality can be used as your personal assistant. The objective of the concept does not force any selective industrial application but essentially the pursuit of all the applications to gain control, productivity, experience to the highest possibility in the contribution of this technology Augmented reality. Augmented Reality is the technology that has an impeccable impact in all fields, industrial, education, medicine, military, tourism and so forth. The areas of improvement, advantages and detriments, have been taken a shot at in this report. The paper covers the cause and the historical backdrop of Augmented Reality, its working, highlights, and necessities. AR is the key technology solving all the imaginary assumptions, is what one would understand eyeballing this report.
Keywords: *augmented reality, NAVICAM, laproscopic surgery, head mounted display*

Introduction

Computers have assumed vital part in the advancement of people since the season of its innovation. They have experienced huge progressions ideal from Vacuum tubes to Artificial Intelligence for effective connection with clients. The cooperation between the virtual world and the 'true' Earth is the key point in the innovative advancement of computers. Virtual reality (VR) and Augmented reality (AR) are the parts of concise edition of the virtual world and human condition.

AR in the immediate future would be unified with the abundance of application that makes good things leading to better lives that would be truly vital .Virtual reality puts the users in a 3-Dimensional environment that stimulates authentic-time environment and Augmented reality integrates digital information with the user's environment. Augmented reality is driven by the conception to merge graphics, audio and other sensory factors on the real time environment. Augmented Reality alters one's speculation of a real-world environment. Augmentation largely works on two terms, one of which is hybrid reality and the other- computer mediated reality.

Hybrid Reality refers to the combining of both real and virtual worlds to give us a new vision of the nature. There is a co-existence and interaction of real and virtual environments. This sanctions us to integrate or subtract information from or even lets us shape the reality with compact technology like hand held contrivances. Such contrivances can even include Smartphone or smart watches.

Initial applications of Augmented Reality focused on gaming, until the realization of their uses on a broader area. Augmented Reality has a wide versatility is medical training and surgeries. It additionally is highly utilized in education, business, tourism, manufacture and a lot more fields in today's world.

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Literary Survey

[1] In contrast to Virtual Reality, where the user is inside a synthetic environment, Augmented Reality superimposes virtual objects to the environment. AR can be characterized by the following aspects: combining real and synthetic world, interactive and 3D registration. Augmented Reality has a wide range of applications in several fields of today's world like medicine, manufacture, annotation, education, robotics, entertainment, military and many more.

Doctors would be able to use AR to envisage human bodies for study and surgery. It would become easy to draft 3D datasets of a patient, with the use of non-invasive sensors like the MRI, CT and Ultrasound. This will be effective in minimal invasive surgeries and will reduce traumas in surgeries by very small incisions or no incision at all. The problem faces by surgeons today is that the small incisions do not provide a detailed internal view of the patient. The use of AR would help doctors perform critical operations more efficiently.

AR will also be useful in medical training purposes. Novice surgeons would be able to get virtual instructions without the need to divert from the patient for a manual. AR would also help identify organs and assist surgeons at the course of the surgery. There are several researchers working towards developing the application of AR in medical industry. A research group has carried out experiments of using ultrasound sensor to scan the womb of a pregnant woman. The information was processed to generate a 3-D representation of the fetus, at UNC Chapel Hill. The main objective was to allow the surgeons get a detailed visual of the fetus. Further, recent studies have focused on a needle biopsy of a breast tumor.

[2] The 1950's marked the period of initial development of AR. Morton Heilig, a cinematographer saw that cinema was an entity that could draw viewers into the onscreen activity. In 1962, he built a prototype described as, "The Cinema of the future" which predated digital computing.

The Head Mount Display was invented by Ivan Sutherland in 1966. He came up with an optical see-through head mounted display, which was the first step taken toward augmentation. From then onwards, a series of inventions and discoveries on the field of augmented reality led to what we have today.

The devices that constitute to an augmented reality system are displays, input devices, tracking devices and computers. The displays used are of three types: head mounted displays, which could be worn as a part of a helmet; hand held displays, which could be a digital device like a smart phone and spatial displays, which make use of projectors, holograms, etc. AR systems could use a wide range of input devices like gloves (used by s Reitmayr et. al.'s mobile augmented system), wireless wristbands (by ReachMedia), etc. Smart phones themselves substitute as pointing devices. For example the Google Sky Map is an application designed such that the user has to point his Smartphone in towards stars and planets which he would like to learn about.

[3] The need for computers has become inevitable for the current era. The people in this world today are being existed in two different worlds, the true Earth and the digital world which are entirely different.

Augmented reality makes the digital world understand the working of the real world and allows digital and real world interact with each other. This is often termed as Augmented Interaction. This interaction makes sure that it reduces the complexity of computer manipulations which even allows people with less computer knowledge to use it. A few attempts have been taken to produce prototypes in which one of it is NAVICAM (NAVIgationCAMera). This NAVICAM has a small

video camera in it which detects the real world situations and that makes user experience the generated informations applied to the real world. The voice command which is added to this technology makes people feel as if they are having an actual person with them who guides him/her whenever required.

The main aim of this technology is to recognize the intention of the user and react accordingly. But since it is just the beginning of this technological transformation, the situations are just a clue to the machines. If these proposed prototypes come to practicality, there would be a drastic change in the human lifestyle.

[4] Apart from saying that education is a must for everyone, now the scenario has changed that everyone gets an insight on most of what they can make out so that they survive among the wittiest. People often incline to facilely acquire knowledge through practical ways rather than theoretical way of work-place. Now the education system is craving for the advancement in technology, which paves the way for augmented reality.

At present the society has a perplexity to choose from digital and the real world where they can involve themselves. But Augmented Reality makes them into a single existence where people can get an immense experience out of it. The use of augmented reality in education makes people study sundry concepts practically without even using the required apparatus. The interface that students get to use turns out to be an authentic experience.

For example when medical students are in need to get an experience on surgery, the surgeon can actually guide the learner to do the surgery by step wise instruction using augmented reality. Here the surgeon need not even be there. The 3-D image of the surgeon's hand can actually be sent out into the space where the surgery is taking place so that the student gets an overall experience. When students are working with machine-like copies made to scale, they can get a complete overview about the structure and the parts of the machine without evening opening the machine.

It even makes kids reading stories interactive where the characters can be brought to life through a holographic projection.

[5] Augmented Reality has been widely used because of its' features in a variety of fields such as manufacturing, design, technology presentations, or clinical psychology. In the educational domain, researchers are actively working to develop AR in learning.

In 2010, Johnson, et al. stated, "AR has strong potential to provide both powerful contextual, on-site learning experiences and serendipitous exploration and discovery of the connected nature of information in the real world."Augmented Reality has been applied to education and business for experimentation. Even though it has not made an impact in education and other fields as much as classic methods since the last two decades, today's technology makes AR competent and compact enough to deliver AR in corporate settings and education through personal computers.

In the field of business, AR can be implemented in several areas. It would help give assistance to employees working with highly complex machines the industry. The use of AR in vehicles and military would also be quite helpful. As for its use in education, AR would drive students to learn better in practical application with more details and clear picture of the subject. There has been tremendous development on implementing AR on these fields. It is just a matter of time until which AR would be a basic requirement on the industries.

[6] The field of surgery requires the utilization of AR for the advancement of effective results. One of the main issues that people are facing currently is the lack of skilled doctors. And sometimes even if the surgeon turns out to be adept, the need of technology arises. Improvement of technology

in the field of healthcare is adequate for the current era. The Google Glass contrivance is recently being used in the field of surgery for the betterment of the outcome. This was tested in several medical centers before coming into practicality. Utilizing this technology, a surgeon who is far away can guide the medico who is giving effect to the surgery. The experience would be as if the remote surgeon is actually present there where the surgery is taking place. This was made possible by the utilization of Google Glass.

There were many successful outcomes of which one was the surgery of a sixty six year old man's shoulder bone. But as this was the first version prototype, the surgeons had to face the quandaries caused by this technology. The problems were viewing angles which did not match through being without error, the battery drain, poor audio quality and as such. So the industry expects to have a range of observation of getting well and a scope of amendment in such technologies for the betterment of healthcare industry.

[7] Augmented reality requires a special requisite where the structure is engendered by the computer graphics and are linked with the scenes that are visually perceived by the humans i.e. the position of the scene and the computer generated graphics have to match. For e.g. AR is used to guide the mechanics who repair the aircraft parts during aircraft maintenance. During inspection of the aircraft an object known as "Head Mounted Display" also known as HMD is used.

This HMD works on the substructure of AR and is used to view the plane's blue print in a virtual view generated by the computer graphics. This HMD is used by service engineers during the time of inspection. Similarly the HMD can be used by surgeons to perform surgery as HMD produces the blue print of the organs so that the surgeons are able to do the surgery without any difficulties.

The latest challenge of AR in view of medicine is the development of "Computer Aided Surgery" (CAS) which guides the surgeon to perform surgery. It works on method of intra operative image processing which belongs to the field of AR. The benefit of using CAS is that it makes surgeon concentrate more easily on the surgery in lieu of visually perceiving the monitor.

[8] Augmented reality is nowadays used in Laproscopic surgery so that it is comfortable for surgeons who perform surgeries without optically canvassing the monitors which are present to designate the positions of organs and the instruments used during the surgery.

Here the framework contains a head which has a six degree liberation, it additionally uses 3D visualization and also extracts laproscopicimages. Here the system produces a real and virtual image which is actually merged and is visible in the surgeon's head mounted exhibit. By using AR technologies we can reduce the problems which are caused by laproscopy.

[9] Augmented Reality technology proves to be useful in a lot of fields like education, business, entertainment, etc. Along with these, it additionally proves to be subsidiary in tourism, to amend tourist experience to a great extent. As for the field of tourism, AR would prove to be highly useful to both the organizations as well as the tourists. The service providers would be able to reach a wider range of audience by implementing AR to deliver overwhelming media content and information. AR would give the tourists immense entertainment and contentment by sanctioning them to get facile information and cognizance about their circumventions instantly.

Web servers, internet service, database for information, location based AR applications, GPS, high CPU speed, graphics, considerable RAM are all requirements for the use of AR in tourism. The use of Smartphone would cover most of the requirements above and is quite compact for efficient use.

[10] When it comes to tourism, Augmented Reality plays a decisive role. The most prevalent problems faced by the tourists are habituating to their tourist spots. People generally get perplexed with the language, history of that place and sometimes they don't even know what that place is. Here utilizing Augmented Reality ascertains an availing hand for those who seek it. As previously, for using Augmented Reality, there is no need of any separate device. It can be embedded in your mobile phones and be handy to the users. People get acquainted with the details on the places they visit, location details, etc.

But there some problems associated with the use of this technology like the lack of visualization of the content. Sometimes circumscribed exhibit content additionally engenders a disadvantage.

Findings

The research of this analysis has brought a high level of clarity of purpose with this overwhelming technology Augmented Reality. Initially it was thought that Augmented Reality is a concept under development and that it has an exceptionally slender territory of utilizations, constrained to amusement and gaming. It was additionally taken that the study of Augmented Reality is not taken to a very great extent and has very less people working on it.

In the study, it was found that it had great potential in the field of healthcare and creation of Augmented Reality dated back to the 1960's and had its first use in cinemas. The study was done on the working principles, technological requirements, feasibility and uses. The areas of application covered in the preparation of this journal are education, business, medicine, tourism, entertainment, day to day domestic uses, etc. The developments of this technology for future uses were also studied. This journal helped in understanding the growth of technology and its impact in day to day life.

Recommendation & Conclusion

The next step of this journey of AR would be not out of willingness, that being highly indispensible to apply the proficient skillset to multiple processes for e.g. projectors with holographic image sensing technology where it allows users to work with virtual objects as precise as the real objects. Enhancing the concept of completely hands-free driving technology. It would help configuration precisely fit generation for real time uses.

Augmented reality is the innovation that clears approach to different extraordinary potential outcomes and will be inexhaustibly required later on. If education system completely utilizes Augmented Reality, then learning would turn out to be most intriguing, intelligent and simple rather than a sophisticated study of books and theory.

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