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A REVIEW ON APPLICATIONS OF AUGMENTED REALITY PRESENT AND FUTURE

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Abstract- The objective of this paper is to provide an overview on Augmented Reality (AR) and the main applications of this technology. It describes the various fields in which AR is applied nowadays or will be applied in the near future. It also provides a brief overview on AR devices and provides solutions to some common problems which can be improved with the help of AR. Some features of Augmented Reality will be conferred in this paper.
Keywords: Augmented Reality, Virtual Reality, Head-Mounted Displays.

1. INTRODUCTION

The AR has served for a decade, but significant development and change have occurred in recent years. In 1997, a research study on numerous issues and developments was first written (based on a SIGGRAPH 1995 lecture). Since then, the business has expanded steadily. A number of innovative conferences took place at the end of 90, including the International Summit on Enhanced Reality, the International Symposium on Mixed Reality and the AR Innovation Meeting. JMS was a productive cross-disciplinary project with headquarters in AR, in particular, and the German ARVIKA project. The AR-Toolkit is now accessible for simple development of AR applications. This wealth of new technologies provides an up-to-date survey that contributes to more work in this exciting field. In other ways growing truth is used for a number of reasons over the years. AR is used as a support mechanism for carrying out human activities in most regions. In the areas of surgery and craft development, AR has incontestable its helpfulness to extend the performance and preciseness of activities.
Augmented reality (AR) is a natural world view, the components of which are changed or improved by advanced computers. If Virtual Reality (VR) combines physical world with simulating reality, on the other hand, AR stands for atmosphere elements like sports scores on TV during a match in physical time and in a particular context.
Designed to display the scene enhanced should be using handheld apps such as Head-Mounted Displays (HMD). An AR system's main purpose is to enhance the user's view of the physical world by introducing 3D visual artifacts to the physical environment which appear to be co-existing in the same space as the real world.

2. AR DEVICES

2.1 See-through Display

The involvement of well-known firms: Equipped hardware and optical corporations including Sony and Olympus now manufacture invisible light, LCD-based screens for the streaming of videos and video games. While these devices do not embrace stereo, they are fairly low-resolution (180 K-240 K pixels), limited fields of view (about 30° horizontal) and reasonably compact (under 120 g) and provide an inexpensive video search solution. Sony developed real SVGA optical view-through displays with stereo versions, which were used widely in AR testing, and later discontinued.
Displays: Hopefully, head-worn AR displays should not surpass a pair of sunglasses. Many firms design displays that integrate show optics into traditional lenses. Micro-Optical developed a family of eyeglass displays where the photo of a tiny color monitor, placed on a front of the ear, is replicated by a prism with the same angle, inserted in a normal prescription lens. The "forgettable" Minolta concept monitor is supposed to be sufficiently light and unpredictable to allow the consumer forget it's wearing. Some only see a clear lens without a hint that the panel is on and the panel weights less than 6 grams.

Fig. 2.1 Minolta Eeyeglass

2.2 AR Projector

An alternative solution to AR is to explicitly project the required abstract knowledge on the objects to be extended in the real universe. The coplanar surface and the monoscope lighting frame are positioned in the easiest spot. One of the projectors include an optical bench on a virtual display of optical paths by digital components and a program in which a remote user monitors a laser pointer used by other users to point out fascinating subjects.
The projective AR solution is based upon projection eyes, whose images are projected onto world objects along the viewing path of the spectator. A reflective coating reflects light back around the incidence angle is valued to the target objects. Many users can display various images on their own head-wearing devices projected on the same target, because the projected images can only be seen in the projector section. Non-retroreflective physical objects can mask virtual objects by using fairly low performance projections.

Fig. 2.2 A Prototype Head Projector

2.3 Tracking

Active AR requires knowledge of not only the position of the device, but also of all other environmentally related objects. First of all, a deep map of the current scene is needed for occlusion. We have also recently extracted the depth map from a variety of apps, and re-projected the depth map onto a different context. The 3D cupola in 49 cameras which capture the later 'visual replay' sequence, takes this idea to its limit.
Ultimately the analysis of natural characteristic feats (i.e. artifacts already existing in the environment without modification) that the consumer sees will rely primarily in unprepared environments. If an atmosphere database is available, the monitoring of the nearby buildings can be based on the visible horizon outline or on projected views matched to the picture. In addition, provided a specific group of established characteristics, a monitoring device has been demonstrated to identify and quantify new natural environmental characteristics automatically.
The greatest cause of failures in enrollment is always machine delays. Predicting motion is one means of reducing delay effects: recent efforts to predict acceleration and to transition between different models have been rendered more accurately. Latency of the system may be designed to reduce or eliminate errors entirely by means of careful device architecture.

2.4 Monitor Based

Computer Based AR still uses combined video feeds, but the view is more traditional like a hand holding laptop computer. Maybe the least complex AR configuration is, because it eliminates HMD problems. Princeton Video Photo, Inc. has developed a system for combining graphics in video streams in real time. Their job is widely recognized as the first downstream transmission of live sports. It is also used in various broadcasts for positioning commercial logos.

Fig. 2.3 Monitor-Based AR

3. APPLICATION

The device Augmented Reality has various uses, including television, education, medicine, electronics and development.

3.1 Therapy

AR will incorporate real-world visual elements and surroundings. It is really beneficial as it helps people to dive into the physical world while viewing sensations that seem to be almost actual. Not only does it strengthen the interaction, but also helps clinicians to observe the responses of their patients in order to cause and track the stimulus.

Fig. 3.1 Monitor-Based AR in Therapy

Within the area of mental health, within addition to phobias, there are new possible causes for AR. An illustration of this is Facebook's shared cyber universe. This will help people become more conscious of their surroundings, in particular those with Depression, social phobia, nervous disorder and more.

3.2 Archaeology

By inserting items such as a three-dimensional model as real-time, animation, film and audios, where an element that wants to communicate with enhanced specified AR is contacted by different channels such as smart phones, webcams or displays with the physical world. The generated image tends to be portrayed to the public in the actual world by combining the vivid images with the real world. The number of AR-equipped telephones known as print media outlets, records, cinematography, radio, television, the Internet and cell phones is estimated to be more than one billion in the world by 2020.

Fig. 3.2 Monitor-Based AR in Archeology

3.3 Education

Conventional educational plans can be presented for AR usage. Content, designs, video and sound can be superimposed over the understudy's continuous world. Books or some other instructional perusing materials will incorporate "markers" that are inserted in them which when checked by an AR gadget, give extra data in a progressively distinctive way. Understudies can interface with CGS (computer produced reproduction), so they can encounter major recorded occasions in an increasingly distinctive way.

Fig. 3.3 Monitor-Based AR in Education System

3.4 Medical

AR may remind the surgeon of the pulse, blood pressure, patient organ status etc. AR may provide details. This will even help the specialist recognize the patient's concern quickly. This method is close to the repair technicians. Applications involve an X-Ray Virtual Vision focused on past tomography or on real-time photographs of ultrasound and confocal microscopy samples. AR may enhance fetal vision in the womb of a woman.

Fig. 3.4 Monitor-based AR in Medical Science

3.5 Military

All through the war, AR will fill in as an organized specialized gadget that conveys important battle information all through ongoing on an officer's weapons. Through the perspective of the officer, people and things with various markers might be named to caution of potential dangers. Inside a remote focus of commando, reproduced maps and photographs of the 360 ° see camera may likewise be made to help the direction of a trooper and the perspective of the combat zone. Fighter pilots use a HUD (Heads up Display) in their aircrafts to find targets in any weather or during the night.

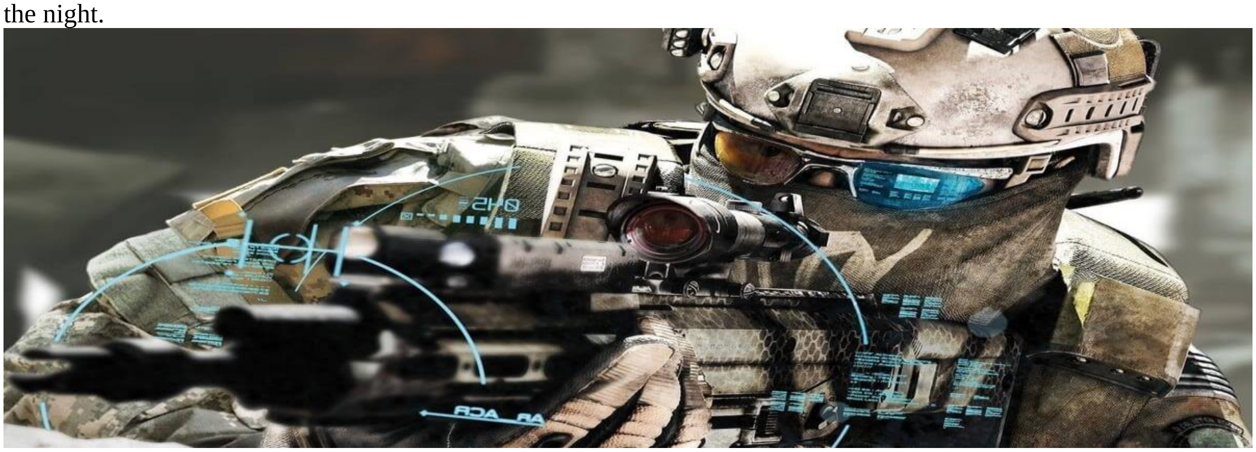

Fig. 3.5 Monitor-based AR in Military

3.6 Navigation

The performance of navigation devices can be improved by AR. Information on where the user is going will be reflected on the windshield of the vehicle. Not only can details be given about how to get there but details on the environment or the landscape can also be made available. In case of emergency or highlights of items that may not be detected by the driver at a first glance, AR may provide driver traffic information, as well as warn the driver. Fishermen may also use this device in the sea to show the details on the quantity of fish in the region and how to get there.

Fig. 3.6 Monitor-based AR in Navigation System

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4. FUTURE WORK

4.1 Real World Mapping

'Mirror worlds' are alternate real-life dimensions that can occupy a physical space. Sitting in your office will dissolve in a beautiful lake the floor underneath and each desk can become a sailboat. The world of mirrors turned pencils and tabletops into touch screens in the classroom. Pokémon Go was just the beginning.

4.2 Better Manufacturing

Using AR technology companies will build strategies to improve the driver's safety conditions. Such techniques would allow drivers to concentrate entirely on the street while simultaneously receiving input on a telephone screen. This method can also increase the driver's comfort in the car and encourage him to drive his vehicle comfortably.

4.3 Natural Experience

Everybody wants the understanding of movements to be strengthened. Other things are important to focus on, such as gaze directions. It is easier to make a comfortable product and provide the consumers with a normal experience. For example, when a user looks at an object and it is identified instantly, it would be very important. We can do this in real life by preventing a person's work from turning his back.

Fig. 4.1 AR in Real World Mapping System

CONCLUSION

At just one click of a button your whole way at looking at things will change with a seemingly simple technology. The field of AR is ever growing and with new technologies being invented uninterruptedly AR would be more accessible and interactive to its audience. The ultimate goal of AR is to create a system such that a user cannot tell the difference between the real world and the augmentation of it.

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