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Augmented Reality Application and Issues

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Abstract: Augmented Reality is within a farther usual context termed Mixed Reality (MR), which points to a multi-axis spectrum of areas that cover Virtual Reality (VR), AR, telepresence, and other related technologies. Augmented Reality pre-existing over a decade, but in recent years the growth and progress has been outstanding. Since, the field has grown rapidly. Many conferences specifically designed in this field were initiated, including the Symposium on Augmented Reality and International Workshop, the International Symposium on Mixed Reality, and the Designing Augmented Reality Environments workshop.

Augmented reality is hidden frame of reference, usually masked behind marker images, which is included in printed and film media, to analyze and identify the marker is laid out as long as length of time is relevant, in a stable position for an application. The marker might have to remain visible depending on the content. An AR system's interactive competence often plays a vital role in complementing the display capabilities that benefit to augment real-world tasks.

Keywords: Virtual Reality, Augmented Reality, Mixed reality

I Introduction

AR, or augmented reality, is a expanded area in studies on virtual reality. It is challenging to duplicate the abundance of statistics provided by the natural world around us in a computer. Virtual environments were employed by worlds to demonstrate this. These worlds can be extremely basic, as those made for immersive gaming and entertainment, or they can be extremely complex, like flight simulators, which cost millions of dollars but give a more realistic atmosphere. The user is presented with a composite vision using an augmented reality system.

It is a blend of the actual scene that the user examines and a virtual scene that the computer created and enhanced with additional data. The desired outcome is to design a system in which the user is unable to distinguish between the real world and its virtual addition.

Literature survey

Augmented Reality: Applications, Challenges and Future Trends
Author:-Mehdi Mekni Andre Lemieux ´ University of Minnesota, Crookston Campus TANYT, Quebec (QC), Canada mmekni@umn.edu ALemieux@Tanyt.com[11]
More realistic content that regularly synchronizes with displays of actual scenes could be considered a new category of intuitive design known as enhanced reality. As a result of the proliferation of small, multipurpose devices capable of producing oddly enlarged reality scenarios, research into the enormous potential of augmented reality has begun. This paper studies the current state-of-the-art in augmented reality. It illustrates work done in entirely different application environments and explains the leaving challenges encountered while developing applications for expanded reality while taking into account the specialized and ergonomic limitations of mobile devices. Future bearings and zones requiring advance investigate are presented and talked about.

Augmented Reality Technology and Its Game Application Research
Author:-Duan Ganghai,Han Minglei,Zhao Weiqi,Dong Tianhao,and Xu Tingting[12]
Expanded reality innovation is amongst the finest smoking points within the field of computer vision. This paper efficiently surveys the investigate status of vision-based expanded reality innovation. To begin with, it traces the current investigate status and application of expanded reality innovation; besides, it explains the key advances of increased reality, counting show innovation, following enlistment innovation, interaction innovation, and calibration innovation. At last, concurring to the diverse working strategies, All AR diversions are divided into two group, basing on settled designs and basing on topographical area, giving a brief presentation to the AR diversions that stand out on the showcase.

II AR Components

1. Scene Generator

A software or device used for rendering the scene called scene generator. Rendering is indirect among the major issues in AR, because a few virtual objects required to be drawn, and they frequently do not have to be practically rendered to provide the purpose of the application.

2. Tracking System

The tracking system is exceptionally a key issue on AR systems mainly because of the listing problem. Real and virtual worlds the devices used must be properly coordinate with respect to each other, or the confusion that the two worlds coincide will be agreed. For the industry, many purpose demand exact enrolment, specifically on medical systems.

3. Display

The mechanism used in AR is still ongoing and results depend on architecture choice. Almost all presentations devices for AR are HWD (Head Wear/ Mounted Display), but other results can be form.

While connecting these two worlds we have two basic technologies: optical and video technology. Each of them has some payoff depending on elements like decision, adjustability, field-of-view, enrolment strategies, among others.

Augmented Reality vs. Virtual Reality

Augmented Reality

- System progress the actual scene
- User controls a sense of existencein real world
- Needs a tool to join virtual and Augmented worlds
- Tough to entry real and virtual

Virtual Reality

- Absolutely immersive situation.
- Senses are covered by regulation of system
- Need a system to grain virtual world to user
- Tough to form VR world attractive

Advantages

- Can increase learning and data.
- People will be able to communicate with each other across great distances in real time and exchange experiences.
- "Real" experience is provided morein games
- Things come to life on people's mobile
- Increase Sales

Disadvantages

- Spam and Security
- User Experience using AR can be inappropriate in social situations.
- Openness: Everyone are free to create their personal layers of content to display

III Application

1. Head-worn displays (HWD)

Users wear this display on their heads, on condition that imagery is in front of their eyes. Two types of HWDs exist: optical see through and video see-through (Figure 1.1). The final uses video capture from head-worn video cameras as a background for the AR surface, put on an opaque display, as long as the optical see- through method furnish the AR surface through a transparent display.

Manufacture of color, liquid crystaldisplay (LCD)-based on consumer head- worn displays purposefully for watchingvideos and playing video games is been established by electronics and optical companies (for example, Sony and Olympus). Relatively these devices have low resolution (180,000 to 240,000 pixels), small-scale fields of sight (just about 30 degrees horizontal), and does not hold up stereo, they're comparatively lightweight (below 120grams) and offer a moderately priced option for video see through research.

Fig 1.1 Virtual Retinal Systems (HWD)

2. Medical Training

AR offers a lot of advantages in the realm of healthcare education. As an illustration, the Healthcare provider can quickly set up an app or program on his phone. The first screen will show the location of the tracking patterns in the sick person's body once the healthcare source selects a compute from the list. Following the patterns' appeal, the training model will begin.

The training software will show a 3D animated simulation that shows exactly when, when, and what the various maneuvers ought to be used. In addition to moving the phone forwards or backwards, the user can also alter the simulation's point of view by adjusting the animation. Furthermore, he has the potential to display additional alerts throughout particular phases of the measures [6]. One of the apps using augmented reality (AR) for medical training mechanical elements is shown in Figure 2.1. A similar book has been taught in an engineering graphics course for a mechanical engineering degree at a university in Spain [7]. Figure 3.1 shows the enhanced book.

Fig 2.1 Example of augmented reality training

3. E-book

E-book outlines a tangible connection (augmented book) depending on AR mechanism for learning standard mechanical elements. In mechanical engineering degree of Spanish University [7] has a subject called as engineering graphics which has a similar book. Figure 3.1 represent the augmented book.

Fig 3.1 Example of augmented book

4. Clothing Shopping

E-commerce is observed as applicationof the AR apps. People can't forecast whether clothes will fit them or not especially while shopping online. Henceforth, discrete set up to link AR with online shopping, e.g. clothing shopping. This pace helps to defeat a major barrier that is people select cloths and simultaneously refine the quality and passion of this trading to new extent [8] as represented in Figure 4.1.

Fig 4.1 Example of Clothing shopping

Issues in AR

- **Performance Issues**

AR can slow down often and real time processing of image might be a challenge.

- **Interaction Issues**

End users inside a mixed environment owing to the fact of AR have a problem interface with the environment as normal.

- **Alignment Issues**

People functioning in this realityare more careful to align errors. Proper calibration and alignment with the reference support of the globe is critical.

Conclusion

In this digital era AR is addition step as we will presently look our habitat switch vigorously likewiseby a Smartphone, car windshields, glasses and windows in later to show amplify the content and channel right there. AR has astonishing implementation that can greatly permit us to reside a person reliable, more explanatory and more productively.

Reference

[1] Cakmakci, O., Ha, Y., and Rolland, J.P. (2004). A compact optical see-through head-worn display with occlusion support. Proc. ISMAR '04 (IEEE and ACM International Symposium on Mixed and Augmented Reality), 16–25.

[2] Bimber, O. and Raskar, R. (2005). Spatial Augmented Reality: Merging Real and Virtual Worlds. A K Peters, Ltd. ISBN1-56881-230-2.

[3] Halle, M. (1997). Auto stereoscopicdisplays and computer graphics. ACM SIGGRAPH Computer Graphics, 31(2):58–62

[4] Ronald Azuma, Yohan Baillot "RecentAdvances in Augmented Reality"nov/dec 2001

[5] Abrar Omar Alkhamisi, Muhammad Mostafa Monowar "Rise of Augmented Reality: Current and Future Application Areas" Nov 2013

[6] J. Echeverry and D. Méndez,"Augmented Reality Train- ing," 2010. http://www.fabiangarzon.com/ar_training_2010.html

[7] J. Gutiérrez, "Proposal of Methodologyfor Learning of Standard Mechanical Elements Using Auity," ASEE/IEEE Frontiers in Education Conference, Rapid City, 12-15 October 2011, pp. 1-6.

[8] Pereira, C. Silva and M. Alves, "Virtual fitting room Augmented Reality Techniques for e-Commerce," Enterprise Information Systems, Communications in Computer and Information Science, Vol. 220, 2011, pp. 62-71.

[9] Azuma, R. T. (1997). A survey of augmented reality. Presence: Teleoperatorsand Virtual Environments, 6(4):355–385.

[10] Bimber, O., Wetzstein, G., Emmerling, A., and Nitschke, C. (2005). Enabling view-dependent stereoscopic projection in real environments. Proc. ISMAR '05 (IEEE and ACM International Symposium on Mixed and Augmented Reality), 14–23.

[11] Augmented Reality: Applications, Challenges and Future Trends,Mehdi Mekni Andre Lemieux ´ University of Minnesota, Crookston Campus TANYT, Quebec (QC), Canada mmekni@umn.edu ALemieux@Tanyt.com,2014

[12] Augmented Reality Technology and Its Game Application Research, Duan Ganghai,Han Minglei,Zhao Weiqi,Dong Tianhao,and Xu Tingting, 2018