A Review of Augmented Reality and An Attempt of Creating Video Book For Kids

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Abstract— **This paper contains a review of augmented reality, applications of augmented reality and challenges involved in devolving augmented reality based applications. This paper also contains a brief idea about proposed system of video book for children. Video book is augmented reality based application which is knowledge as well as fun application for children. Enhancing the knowledge of kids and providing right entertaining to them would be easy with the help of this application.**

*Keywords***:** Augmented reality, Virtual reality, video book.

I INTRODUCTION

Augmented reality can build a bridge between real-world activities and digital enhancements and increase enthusiasm of children in knowledge exploring process [1]. Augmented Reality is a technology that calculates the angle and position of the camera and adds related images on to the relevant real world in real time.

Augmented reality technology provides a natural style for human to interact with mobile device and give a live direct or indirect view of a physical, real-world environment whose elements are augmented by computer-generated sensory input [2]. Augmented Reality is an advanced development based on Virtual Reality.

Virtual Reality is a technology that simulates three dimensional virtual space and offers virtual sound, sight and touch. Because of which user feel being in a real world, and observe the virtual space. Augmented Reality is slightly different from Virtual Reality. Along with virtual reality user is completely involved in the simulated environment. Whereas Augmented Reality a profound technology that can reinforce the physical world by overlaying computer-generated information on it. People are immersing in an artificially created virtual world and the real world [3]. And it is observed that not only adults but children are showing high interest for AR technology. In this paper an attempt is made to review the augmented reality and an implementation video book as its application.

II AUGMENTED REALITY

The basic purpose of augmenting objects is to intensify the user's interaction and perception with the real world by appending the real world with unreal objects that appear to coincide with the real world [4].

Smart phones and tablets are all most ideal devices for fulfilling the basic   AR requirements needed for everyday applications. These devices are capable of capturing touch, images and moments, they are also capable of finding positioning of device in space. With acquired real time data and virtual data rendering is done to deliver final outcome to the user's device. Augmented reality (AR) based systems can be classified in three different classes depending on the input devices used in it. Brief introduction of these classes are as follows

1. Monitor-based AR system: It involves the computer monitor with attachment of camera. Camera works as an input device for capturing the image from real world. With computer graphics real world input image and virtual image get simulated to produce final augmented image. It is simple process but gives less fascination to the user.

2. Optical See-through AR system: As name suggest this type of systems use optical principles. In this, system needs special attachment like optical head mounted display (HMD) which consists of optical mixer. This head mounted display can reflect artificial images, and let real images cross the lens, and let a user look through it.

3. The Video see-through AR system: Similar to the optical see through AR systems, this system also uses HMD which is based on video synthetic technology. Video synthetic technology takes inputs replays and synthetically transforms a single frame. This technology can be used in different sporting events.

The display superimposes the virtual objects over the focused environment, so that an augmented reality is seen [5]. The most affordable and frequent option is to use a Handheld Display like tablet or a smart phone. These allow the ease of communication and use of AR, making it more user friendly [6].

Applications of Augmented Reality

Augmented reality can be used in various fields like medicine, military, engineering and also be used for maintaining precise instruments. This paper contains some short description of various fields where AR applications are used.

AR in Medical Domain:

Augmented reality is very helpful technology for medical students. With the help of this technology, students can

easily learn the human body and can observe surgery with better angles and views. With use of augmented reality medical students can understand practical concepts better then only class room lectures similarly surgeon can delivered knowledge to the students with more visible details. It will also help in enhancing the success rate of the operation.

AR in Military Area:

Augmented reality based military applications are serving as a life saving elements. It helps in detecting the information from strange area in real time. It also provides better geographic data about the unknown battlefield. Such applications can provide information regarding airplane, airplane navigation and target locations.

AR in Historical Places:

Historical places carry their own stories which may not be imagined by every visitor coming to that place when it is described verbally. With augmented reality applications each story or characteristics can be visualized by the visitor. It would be a good source of knowledge and it can give a chance to the user to feel like a part of that era.

In case of incoherent relics, AR based applications can provide a complete view by collecting all the fragments of the relics. This could be completely new experience for the user to see the actual model build from its scattered pieces.

AR in Entertainment world:

Most popular and well known games INGRESS and POKEMON GO are the examples of augmented reality based entertainment applications. These are known for improved interaction between real world and player. These games are available throughout the world and there are clubs which gathers common interest player for some events. This type of entertainment making world excited playground for the people.

AR in Navigational Systems:

Wikitude and Nokia City Lens are the examples of navigation applications based on augmented reality. These applications provide you the information about the area focused by the camera of your mobile handset. Initially provided information could be with short description labels which may contains name, location and approximate distance from where you are heading. When particular spot get selected, other options of the type will get displayed on the screen. This type of application is very helpful to catch desired location at unknown place.

Challenges in Augmented Reality

1. Latency: When user is not steady and roaming around then superimposing of virtual data should be done at highest speed to provide right information to the user. Synchronization of real time data with virtual information is one of the important process taking place in AR based system. While doing this system could lead to the latency related issues. Latency should be minimized to provide the best fantasy and accurate information to the user.

2. Special hardware required for using augmented reality based systems should be user friendly. Like head mounted device should be light in weight and it should be in comfortable in size to carry on head.

3. Capturing and tracking systems are heart of AR based applications so it is necessary to check accuracy of these systems. Similarly optimized algorithms should be used to filter unwanted data.

III PROPOSED SYSTEM

Video book- application based on augmented reality is an attempt to provide knowledge and fun to the children. For implementing such an application initial requirements could be mobile device with rear camera, internet connection and image book. Image book will contain bright and attractive images with which child will be educated or entertained. When child will focus the camera of mobile phone on his video book page, according to AR application processing real world image tracking will take place. According to the real world data in fraction of seconds the video clip which is actually a virtual data of that image start playing.

Limiting the images will limit the child's access to the internet. So watching the video will be safe and fantasying experience for the children. Depending upon the age group of children images can be collected so that with video book knowledge exploring process would be more interesting

IV CONCLUSION

Augmented reality can build a bridge between real-world activities and digital enhancements. AR systems provide real-time interaction and most importantly fusion of real data and virtual data in a real environment. By considering this property an attempt is made to implement video book - Education and fun based application for children. Video book application will increase enthusiasm of children in knowledge exploring process and it can also entertain to the children with right information. This application is discussed under the title of proposed system in this paper. This paper also contains applications and challenges of augmented reality. Finally it can be said that Augmented reality based applications are creating excitement, fantasy and new angles to see the same old concepts.

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