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Survey on Online Mobile Augmented Reality Application

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ABSTRACT: This paper presents an overview of mobile Augmented reality is a human based interaction technology, which mixes computer generated 2D or 3D virtual objects and render it to the real world scenes. AR (Augmented Reality is used for embedding the virtual objects with the physical objects. The imaginary object becomes similar part of the natural environment. This paper presents a new type of AR application, which visually takes virtual objects in natural environment for simple user interaction. Knowledge based AR used to have virtual view of real world and provide

KEYWORDS: Google Play Store, Smartphone, Augmented Reality.

I. INTRODUCTION

Augmented Reality (AR) is defined as a real-time direct or indirect view of a physical real-world environment that has been enhanced by adding virtual computer-generated information to it. AR is both interactive and registered in 3D as well as combines real and virtual objects. The real environment and the virtual environment comprise Augmented Reality and Virtual (VR) in between, where AR is closer to the real world and VR is closer to a pure virtual environment.

The head-mounted display (HMD) or some might called head-worn display is the result of augmented reality research and also one of the fundamental equipment for accessing the technology. As time goes by, the augmented reality technology has begin to mature to a point where the hardware cost and capabilities have collided to deliver a more feasible AR thus enable the rapid development of AR applications in many fields including education.

II. LITERATURE SURVEY

The identified area of discussion is Augmented Reality or AR and the article is "Augmented Reality: it's like real life, but better". AR, a medium for interactivity and cool visuals, has been around for about 50 years but the term was coined in 1992. There are many uses of AR but best known are the yellow 'First Down' line used in the AmericanNational Football League or NFL and the 'Hawkeye' computer system used in Cricket (pictured below) to find out whether the ball would have actually hit the stumps by overlaying analytic information over the playback footage. With the use of smart phones like Apple's own iPhone (Pictured Below), AR has begun to get more widely noticed and for good reason. It's potential as an advertising tool is almost limitless. It can be used to find a specific restaurant or hotel and then get reviews on that restaurant or hotel. This feature is the application or app built by Layer which can be downloaded to the iPhone.

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Fig 2.1. Hawkeye System

Fig 2 2. AR View

Incredibly useful applications are being developed all the time. For example the Augmented Reality for Maintenance and Repair (AR mar) project. It combines sensors, head-up displays, and instructions to tackle the military's maintenance needs: start working on a piece of kit, and the details about it pop up in front of you. This improves the productivity, accuracy, and safety of maintenance personnel. You just put a pair of goggles on your head and a 3D model appears in front of your eyes, giving you all the information you need. The applications outside the military are also numerous, people can use it on their computer, televisions and other electronic appliances. If and when AR mar is introduced to the public for home use, it could make everyone's lives a lot easier. AR mar also has the added bonus of being a really cool bit of kit.

Ludwig and Riemann (2005) offer an organizational scheme which argues that potential AR applications fall into three main categories: (a) presentation and visualization, (b) industry, and (c) edutainment. Additionally, Hamilton (2011) offers an extensive breakdown and analysis of AR applications within education, as well as within the media and entertainment industry, the gaming industry, the travel and tourism industry, the field of marketing, the expanding field of online social networks, and in everyday life. While Hamilton (2011) and others point out that many current AR applications may seem gimmicky and transient, the fact remains that many of the AR applications discussed by Azuma (1997) have been refined and continue to play important parts in our modern world.

Researchers have pursued AR because it may (a) allow for the enhancement of users' perceptions, knowledge, and interaction with the real world (Azuma et al., 2001) and (b) because AR has the potential to improve productivity in real world tasks (Schmalstieg, 2001). According to Billing Hurst and Henrysson (2009), the research and development necessary for current implementations of AR have gone on over the past four decades. However, it wasn't until the 90s that inertia became significant, and the numbers of researchers and developers in th AR field increased. In recent AR years, growth and progress in AR has been significant (Phan & Choo, 2010). Some of companies currently involved in the development of AR technologies and applications are AR Toolkit, AR Quake, Google, IN globe Technologies, Layer, metaio, nhow Berlin, Tota.

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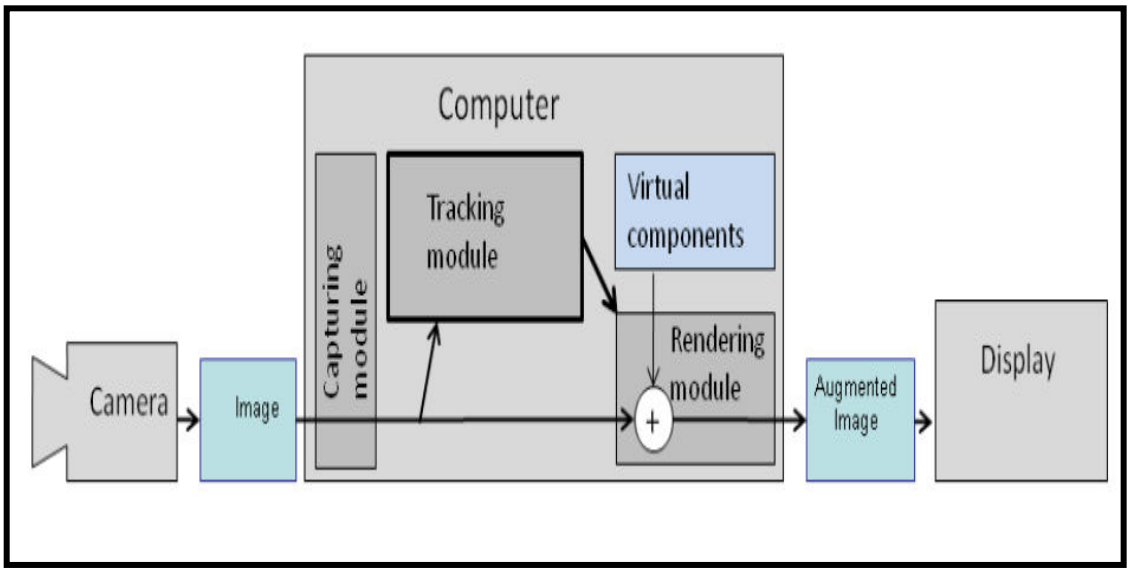
III. SYSTEM ARCHITECTURE

1. The capturing module captures the image from the camera.
2. The tracking module calculates the correct location and orientation for virtual overlay.
3. The rendering module combines the original image and the virtual components using the calculated pose and then renders the augmented image on the display.
4. The tracking module is “the heart” of the augmented reality system; it calculates the relative pose of the camera in real time.
5. The term pose means the six degrees of freedom (DOF) position, i.e. the 3D location and 3D orientation of an object.
6. The tracking module enables the system to add virtual components as part of the real scene.



IV. SYSTEM FEATURES

- **Feature 1: Android 2.1 SDK**

The Android 2.1 platform delivers an updated version of the framework API. The Android 2.1 API is assigned an integer identifier — **7** — that is stored in the system itself. This identifier, called the "API Level", allows the system to correctly determine whether an application is compatible with the system, prior to installing the application.

To use APIs introduced in Android 2.1 in your application, you need to set the proper value, "7", in the android:minSdkVersion attributes of the <uses-sdk> element in your application's manifest.

- **Feature 2: ARToolKit library**

AR Toolkit is a computer tracking library for creation of strong augmented reality applications that overlay virtual imagery on the real world. To do this, it uses video tracking capabilities that calculate the real camera position and orientation relative to square physical markers in real time. Once the real camera position is known a virtual camera can be positioned at the same point and 3D computer graphics models drawn exactly overlaid on the real marker. So ARToolKit solves two of the key problems in Augmented Reality; viewpoint tracking and virtual object interaction.

- **Feature 3: Eclipse**

Eclipse is an integrated development environment (IDE). It contains a base workspaceand an extensible plug-in system for customizing the environment. Written mostly in Java, Eclipse can be used to develop applications. By means of various plug-ins, Eclipse may also be used to develop applications in other programming languages: Ada, ABAP, C,C++, COBOL, Fortran, JavaScript, PHP, Python, Ruby(including Ruby on Rails framework).

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V. TECHNICAL SPECIFICATION

Augmented Reality is accessed and utilized in various forms. From on-the-road to publically displayed locations, here we provide you with a detailed explanation of the most efficient technologies currently available to permit our Augmented Reality.

Marker Tracking (MT): Marker tracking has revolutionized Augmented Reality about a decade ago. However, this revolution came at the expense of visual clutter. We developed methods that allow tracking beyond the visibility of markers to improving robustness. These techniques are highly efficient in their memory and CPU usage and run at interactive frame rates on mobile phones.

Frame markers: Robustness of marker tracking is largely owed to the high contrast afforded by the black frame in a threshold image. The frame itself is not disturbing in many situations, if the interior can be filled with application specific artwork, like a framed painting. With frame markers we therefore take the approach of encoding a digital id with errorcorrection at the interior side of the frame, making it appear like a frame decoration. Frame markers have turned out to be highly attractive for branding, since companies can place a logo inside the marker.

Fig 5.1 Augmented view

Black & White Markers: The detection of interest points is done through black & white fiduciary markers. The increasing use of publically displayed markers such as scan-able codes on advertisements makes augmented reality services immediately accessible. Total Immersion supports this technology without having the disadvantages of open source software, allowing consumers to engage themselves in your product on the go.

Sensor based Technology: Sensor tags through Augmented Reality allow total immersion and clear reception for users. When lighting is limited, sensors are highly effective and can be used in locations where Marker Less Tracking is less productive. Due to powerful filters, when the sensors send a signal to a receiver only pertinent information is processed and displayed to the individual.

VI. CONCLUSIONS

AR is a new technology heavily used in the present technical world. AR technology is used to assist industries with different precise site or field information in real-time. This paper gives an idea about how to implement the technology with the marker based behaviour which provides an easy user interface as well as implementation techniques.

VII. FUTURE SCOPE

Augmented reality systems do exist, but there's still a lot of scope for improvement. In the near future, displays would be reduced to the size of an eye lens said by some scientist (Thomas Lucas, Robert Goldberg) with integrated cameras and sensors. Such a improvement will help us for everyday use.

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