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AUGMENTED REALITY USING WIKITUDE SDK

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ABSTRACT

The origin of the word augmented is augment, which means to add some- thing. In the case of augmented reality (also called AR), graphics, sounds, and touch feedback are added into our natural world. While there are many types of augmentations possible, we have emphasized on Markerless Aug- mented Reality. As one of the most widely implemented applications of augmented reality, markerless augmented reality, uses a GPS, digital com- pass, velocity meter, or accelerometer which is embedded in the device to provide data based on user's location. In this project we have, created a marker that is placed at a specific geolocation. The marker would consist of a title, description, a selected and an idle state which animates smoothly when some specified co-ordinates are encountered.

Keywords: Augmented Reality, Wikitude SDK, Marker-Less AR, Markerd AR.

I. INTRODUCTION

Augmented reality (AR) is a live indirect or direct view of a real world environment whose elements are "augmented" by computer-generated real-world comparable sensory input such as video, graphics, haptics or GPS data. Computer-mediated reality is a generic notion that is linked to augmented reality, in which a computer modifies the vision of reality into something different. Ones existing impression of reality is increased in Augmented Reality, whilst in contrast, the real world is replaced with a synthetic one in virtual reality. Augmented reality enhances the encountered locations or circumstances to deliver enriched, more detailed encounters to acquire a better sense. Originally, the immersive experiences offered by AR technology were used in the entertainment and gaming industry, but now other business industries are also interested in the possibilities and opportunities of AR, for example in knowledge sharing, managing the information flood, and organizing distant meetings, edu-tech industry. Augmentation techniques are frequently executed in real-time and in a pre-defined context with controlled features, such as overlaying extra information, for example showing the scorecard over a live video stream of a cricket match. Advanced AR technology assists in retrieving information about the real environment surrounding the user, making it turn synergetic, interactive, and digitally manipulable. Information about the environment and its items is layered in the real world. This information can be virtual or real, e.g. seeing other genuine sensed or measured information such as electromagnetic radio waves overlaid in exact alignment with where they are.

Aim and Objective

The objective of our project is to develop a markerless augmented reality android application which would be capable of fetching the latitude and longitude co-ordinates from its surroundings and augment a pointer on the screen when it encounters some specific coordinates giving details about the destination.

II. METHODOLOGY

The focus is on producing a markerless augmented reality application utilizing an Android SDK dubbed the WIKITUDE SDK. Based in Salzburg, Austria and founded in 2008, Wikitude is a mobile augmented reality (AR) technology provider that is dedicated to providing location-based augmented reality experiences through its "Wikitude World Browser App", initially, but then in 2012, the company restructured and expanded its prospect by introducing the "Wikitude SDK(Software Development Kit), a framework that facilitates in development by incorporating techniques such as, image recognition ,tracking, and geolocation based technologies, it went on to become the corporation flagship product. Launched in October 2008, the SDK contains image processing, tracking, 3D model rendering, video overlay, location based AR, and SLAM technology (Simultaneous Localization And Mapping) that enables improves recognition accuracy and tracking, as well as marker-less tracking. The cross platform SDK is available for both Android and iOS operating systems, and is tailored for numerous smart eyewear devices.

The methodology used is based on 2 principle types of Augmented Reality:

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- **Marker based Augmented Reality**: Also termed as "Image Recognition", Marker-based augmented reality employs a camera and a visual marker of some form to provide results only upon an event where the marker is sensed by the reader. Marker based applications employ the camera on smartphones to identify markers from any other real world item. Distinct yet basic patterns are employed as the markers, as they can be easily identified and detected and do not take a lot of processing power resources to decipher. The position and orientation is also computed and in which some type of content and/or information is subsequently superimposed on the marker.
- **MarkerlessAugmented Reality**: As one of the most commonly implemented applications of augmented reality, location-based, position-based, or simply markerless augmented reality, uses a positioning system, digital compass, velocity meter, or accelerometer tool which is embedded in most of the mobile devices to provide certain predefined data based on the user's current location and time. A key impetus behind markerless augmented reality technology is the general availability of cellphones and location detecting features they provide. It is most widely used for mapping directions, discovering nearby businesses, and other location-centric mobile applications that have become a common usage today.

III. MODELING AND ANALYSIS

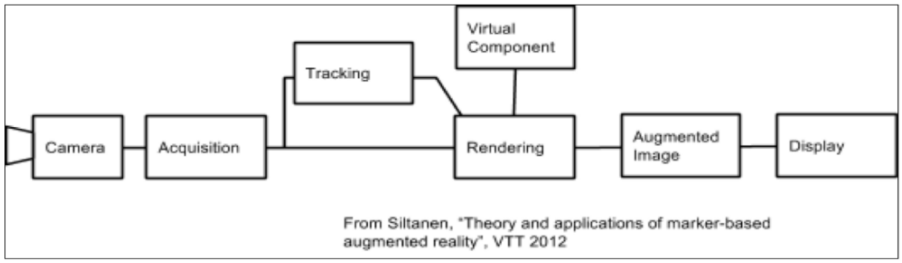

Figure 1: Working of an Augmented Reality Application

The calculation of the pose of the camera is achieved through a two-step process. First a marker or the coordinates are detected and confirmed. Then, using this information, the pose of the camera is calculated. Maker detection happens in a few stages. First, to make detection easier, the camera feed is preprocessed. An important ingredient in this step is converting the camera image to greyscale. This is done for the comparative increase in the processing speed of greyscale images over colour images. In addition, the information obtained from a greyscale image of a good marker is perfectly sufficient for robust marker tracking. Once the correct marker of coordinates have been acquired, the augmentation is superimposed in the camera and an augmented image is obtained. Different augmentations are done in different way, let us discuss the ones we are mainly focused on.

- In case of Markerbased AG, four fixed points are needed to determine the camera's pose. We first take the camera image data and calculate the feature points from all potential markers. We can then compare these potential markers to pre-programmed data, and check whether a potential marker matches any of the markers the device has been looking for. Once a marker has been confirmed, we use the coordinates of its feature points to calculate mathematically the pose of the camera.
- Wheras in Markerless AG, we first take the camera image data and calculate the latitude and longitude of the place. We can then compare these potential coordinates to pre-programmed data, and check whether a potential coordinates matches any of the coordinates the device has been looking for. Once the coordinates has been confirmed, we use the coordinates of its feature points to calculate mathematically the pose of the camera.

IV. RESULTS AND DISCUSSION

We conducted different tests on the applications and the results were successful. Let us discuss some of these test in detail:-

Test for marker based AG:

The application, developed was based on an augmentation being produced when a particular marker(image) was detected, result is displayed in Figure 2.

Some of the tests were:

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- The Image was viewed with different levels of brightness levels, the augmentation was still produced.
- The image was viewed from different distances, it was observed that based on the distance from the image the augmentation's size would also vary.
- When the image was rotated to different angels and viewed, the augmentation would also rotate itself to align with the target image

Result:

Figure 2: Image of a person appears upon encountering the car's photo.

Tests for Markerless Augmented Reality:

The developed application was based on the coordinate system. Upon encountering particular coordinates, some augmentation would appear. Result is displayed in Figure 2.

Some of the conducted tests were:

- The application was tested from different directions and it was capable of recognizing the particular coordinates.
- The range from which the recognition could be done was not very vast.
- Since the application was based on the latitude and longitude of the destination, even in the condition of zero visibility, the augmentation would appear.

Result:

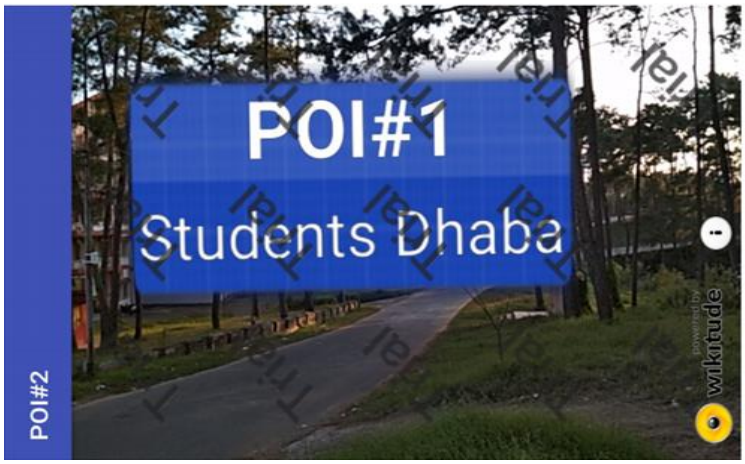

Figure 3: Resturant's name appear upon encountering it's co-ordinates.

V. CONCLUSION

Through the process of working on the project and writing this paper, I got the opportunity to learn about augmented reality, different types of it and also how it can be one of the most beneficial tool for the human race. In the project I developed an android application for markerless augmented reality. The objective of the

project was to develop a marker which would appear whenever some specific co-ordinates would be encountered. Before, developing the markerless augmented reality application I also developed a marker-based augmented reality, which was capable of projecting an augmentation when some specific targets were encountered. The android application was developed and tested successfully.

VI. REFERENCES

[1] John Duckett HTML CSS design and develop websites John Wiley

[2] Augmented Reality, https://en.wikipedia.org/wiki/AugmentedR eality W ik itude,

[3] https://www.wik itude.comGyusoo Kim and Seulgi Lee, "2014 Payment Research", Bank of Korea, Vol. 2015, No. 1, Jan. 2015.

[4] Different types of augmented reality, how to use and develop them, www.realitytechnologies.com/augmented

[5] Android Studio Tutorials, https://developer.android.com/training/index.htm