Augmented Reality, Progress as a Museum System

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Abstract— Augmented Reality (AR) is the concept of combining virtual world and real world. The environment around us provides a lot of information that is difficult to show in a computer. Also these worlds are very simple and mainly created for the purpose of entertainment and games. An augmented reality system is a combination of the virtual environment generated by the computer and real scene viewed by the user that augments the scene. This improves the experience and performance of the user and perception of the world. The ultimate goal here is to use this concept and come up with a system such that the user cannot tell the difference between the real world and the virtual augmentation of it so as to make information gathering more regular and easy. Here we will consider a museum scenario. This paper deals with how it can be done and proposes the development of a module of the system.

Key words: Mobile platform, Augmented Reality, Image Processing, 3-D modelling

I. INTRODUCTION

Augmented Reality is not a new concept. A lot of ideas have been proposed for a long time and a few have been implemented. Almost all the AR applications are made for mobile phones although most of them are made on desktop computers and then exported to mobile phones.

Motivation for a lot of projects is drawn from the fact that mobile phones are being over-used for all the wrong purpose. Also education needs to get more interesting rather than boring. The right incentive is required to achieve it. Augmentation provides that ease and comfort with an interesting approach.

Augmentation is already being used for educational purposes. It mainly revolves around computer graphics while making these kinds of applications. Many academic oriented systems have been made. The concept of coloring books has been implemented with really good strategies, which will be discussed in this paper. There are other such systems especially for subjects like chemistry and maths where augmentation can be done good enough for students to feel interested and enjoy while learning.

Apart from this AR is also being considered as a good guiding system not only for tourists in a foreign place but also for people, senior citizens mainly in indoor navigation system.

This paper deals focuses on the strategies used for various augmentation projects. Further section 2 summarizes the literature survey done by us and, Section 3 demonstrates the design and implementation of the proposed system. At the end we discuss how we plan to take our proposed work further and conclusion is presented in the last section.

II. LITERATURE SURVEY

The number papers being published on AR has certainly increases with time. The paper "Use and re-use of data" which was published in 2014 shows how collection of data can be combined with AR for better use. In the same year another paper" Real time 3-D tracking and reconstruction on mobile phones" written by victor Adrian and group was published which deals with how AR helps in generation of 3-D views on mobile cameras and in reconstruction of images. Next in the same year another paper by Ji Kysela a and group was published that deals with the new media's involvement in data visualisation using AR.

The next year saw many more implemented systems. Zunaria Bhutta and group in their paper discuss the next problems that need to be solved in augmented reality. Author Dario and group in their paper present how AR can now be used in museums here they have taken the example of MUVIG museum in italy. Another paper from the same year 2015 proceeds further to bring AR technology to education for kids and their coloring books.

III. DESIGN AND IMPLEMENTATION

The paper[1] in their paper use a method that updates the texture of 3-D characters at every frame by copying pixels from the drawing for live texturing of a projected AR character from a colored drawing book. The camera image stream of the colored drawing is given, their aim is to process the input which is an image so that the colored drawing can appear as close to the original template as possible. In their approach they achieve this by exploiting the line art drawing part. They consider this step as necessary because the appearance of the drawing changes a lot due to the coloring. We are going to use the concept of markers in our proposed system. We propose a system where a unique markers will be identified like this [1] and once identified the system will display information in various formats. Here we will discuss about the implementation of 3-D information display module.

A. Architecture

The System architecture that we have designed deals with vuforia toolkit for 3-D information display. This toolkit helps in building and binding the 3-D models.
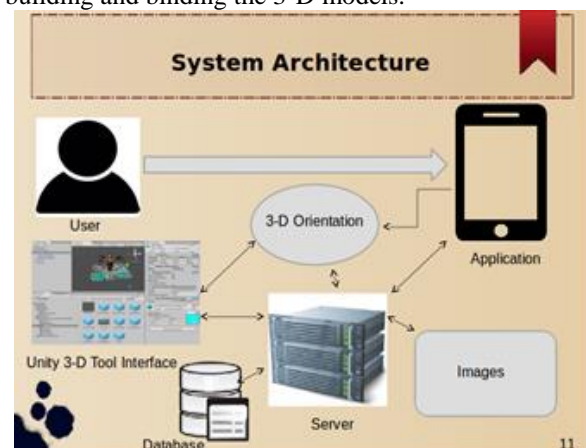

Fig. 1: System architecture

B. Tools Used

To make the 3-D models, sketch-up by google has been used. This is an online tool much like autocad to build 3-D models.
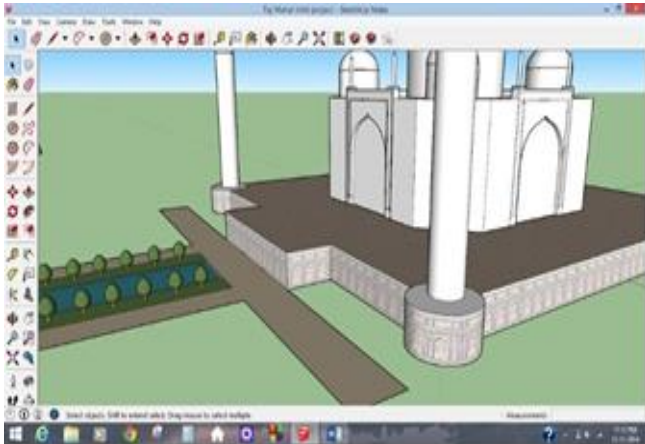

Fig. 2:

To build these models such that we can deploy them on mobile and they can be displayed after selecting a certain option, we propose to use vuforia toolkit. This toolkit needs to be purchased for commercial use and a few features can be used for no cost.

C. System Overview

The implemented module is one part of the proposed system. The proposed system as a whole has a different flow.
1) Log in or register
2) The camera is to be opened.
3) A marker is to be set for each artifact of the museum.
4) When the marker is identified by the camera options appear.
5) The choice is to be made by the user.
6) The information is to be displayed in the selected format.
7) When work is done log out

The formats include text,audio and 3-D.

Fig. 3:

Fig. 4:

IV. CONCLUSION

The 3-D models have been successfully made hence module one of the proposed system has been implemeted. Furthermore the application would that displays information in an animated 3-D form along with text and audio options, when image of an artifact is captured.It is an interesting approach to gathering information and a fun way of gaining knowledge. Here it is for a museum scenario but the concept can be applied elsewhere too.

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