ISSN 2395-1621

AR Based Application for displaying the information in 3D Orientation by scanning a Logo or Image

#1Mahesh Deshmukh, #2Niyaz Khan, #3Sagar Bhor, #4Prof. Anita Shinde

[1]deshmukh.mahesh.n@gmail.com
[2]billniyazsoftech@gmail.com
[3]sagarbhor33@gmail.com
[4]anitashinde@mmcoe.edu.in

Computer Engineering, MMCOE, Pune, India.

ABSTRACT

AR (Augmented Reality) is the area which is growing research in virtual reality. The world around us provides the information that is difficult to store in our computer. Either these worlds are very simple such as the environments created for im-massive entertainment and games, or the system that can create a more realistic environment has a million-dollar price tag. AR system is generate a composite view for the user. It is combination of the real scene viewed by the user and a virtual scene generated by the system that augments the scene with additional information. In all the applications of AR presented to the user enhances the person's performance and perception of the world. The goal is to create a system such that the user cannot identify the difference between the real world and the virtual augmentation of it. In our project we are going to create two different data sets containing logo or any image and other one is for relevant information to display 3D orientation.

ARTICLE INFO

Article History

Received: 13th April 2017

Received in revised form : 13th April 2017

Accepted: 18th April 2017

Published online : 19th April 2017

Keywords: Mobile platform, Augmented Reality, Image Processing, 3-D modelling.

I. INTRODUCTION

There have been many papers on augmented reality in the recent past. Although the concept has been active since the 90's the papers back then were conceptual. The papers that are being published since a few years are more related to the actual implementation. A lot of ideas have been proposed from which a few have been implemented already. Almost all the AR applications are made for mobile phones although most of them can also work on desktop computers obviously.

Augmented reality is the set of techniques that allow virtual elements to be fixed into reality. These virtual elements can use the five human senses, the most common application using images, and sometimes sound. Augmented reality has to combine three features these are 1) combining real and virtual reality 2) Interactive in real time 3) Registered in 3D. AR is a real-time direct or indirect view of a physical real-world environment that has been enhanced or augmented by virtual computer generated information to it.

So, this paper suggests, system which is having a facility to capture image or logo then perform the image processing function on that logo or image and show the information related to logo or image in 3D Orientation.

II. EXISTING SYSTEM

The first applications of augmented reality we can find, are in the army. In the cockpit of the plane, or in the helmet of the pilot, he can see several pieces of information, overlaid on his current view. Then, some medical applications appeared, helping doctors to understand some phenomena, or helping with high risk and hard surgery operations.

Another application that is quite old and famous, is the overlaying of line and information onto the sport grounds, such as in American soccer or ice hockey.

[1] Propose a live system for 3D reconstruction of human face using only single 2D camera without any 3D sensor. Lack of feature points and homogeneous skin color leads to low quality and success rate in

conventional 3D reconstruction algorithms when applied to human face. Moreover, it requires difficult user interaction. To solve this problem, we adopt the facial shape and appearance model to our 3D reconstruction pipeline. This is the first approach which creates a complete 3D face model that can be directly used for 3D printing or virtual reality applications. Model can be acquired using modern smartphone in less than 40 seconds.

[2] Introduce a mobile application that assists students to learn 3D modelling skills and concepts. We provide a natural modeling style with the aid of Augmented Reality (AR). Through a smartphone user interface, the user builds a model with primitive blocks in a bottom-up manner. These blocks are visualized on the printed marker cards that allow users to manipulate (rotate, translate, etc.) them in the same way of manipulating real building blocks. User studies have been conducted and we have identified some aspects that help people to model 3D objects.

[3] Present a 3D augmented reality micro integral imaging display system by combining conventional integral imaging and an augmented reality technique. Compared with conventional integral imaging, our proposed system has two advantages: it provides 3D augmented reality display capability and it has a compact design. To validate the feasibility of our proposed method, we experimented with a 3D scene and used two computer generated objects for augmented reality. By combining the captured 2D elemental images of the 3D object and the computer generated virtual objects, we reconstruct 3D images for the augmented reality micro integral imaging display system. To the best of our knowledge, this is the first report on 3D augmented reality which has been experimentally demonstrated with a micro integral imaging display system. The proposed 3D system has potential to be applied to the head mounted display system due to its small form factor.

III. 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 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.

IV. Summary on 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. In their paper they have this pipeline method.The method uses the following functions:

3.1 Image processing

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.

3.2 Template selection

After the first step to be close to the presented original line art drawings or templates, their system automatically detects the template that appears in the camera stream. The selected drawing or template is then used as the template image in the new system's template-based deformable surface tracking algorithm and for drawing the augmented character afterwards.

3.3 Deformable surface tracking

Allowing deformation creates many challenges for this algorithm since the degrees of freedom in deformable surface tracking is much higher than that in rigid object tracking. The deformable surface given in this system.

Tracking builds upon the existing work and makes it fast enough to run in real time on devices like mobiles and robust enough to handle line art drawings that are colored.

3.4 Creation of Texture and mesh rendering

After the recovery of the 3-D shape of the colored drawing from the camera view, the mesh is re-projected onto the plane of the image and then it means a direct mapping between the pixels of the original drawing and the pixels on the image of the colored template. Then using lookup map the texture for the character mesh is generated. The live view is used as the background

image for a 3-D scene, and using required parameters for the virtual camera, they have rendered the augmented character in the 3-D for the page using the generated texture from the drawing.

V. SYSTEM ARCHITECTURE

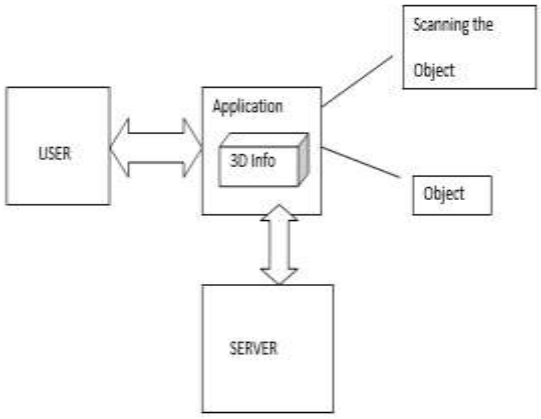

Figure 1. System Architecture

We proposed a mobile application that offers a natural modeling style with the aid of Augmented Reality (AR), which could help students to learn 3D modeling skills and concepts more easily. We adopted a “bottom-up” modeling approach, such that users can build a 3D model with putting primitive blocks together like “LEGO” bricks, by rotating and moving the printed marker cards with their hands. The user studies showed that the users felt our user interface is more natural than traditional desktop 3D modeling applications.

We have identified some aspects that help people to model 3D objects. For example, visual clues are important for them to estimate the distances in each dimension. Besides, users suggested auto alignment would make the 3D modeling more efficient. The ordinary way of creating 3D models (a.k.a. 3D modeling) requires people to sit in front of the computer for a long time working with professional software. The license fees of these software are expensive, and it is very time consuming and not easy to learn. Teachers sometimes find difficult to teach students the concept of 3D modeling because the newbies need to spend a lot of time to familiarize with the tool interface beforehand. In this paper, we introduce a mobile application that assists students to learn 3D modeling skills and concepts.

We provide a natural modeling style with the aid of Augmented Reality (AR). Through a smartphone user interface, the user builds a model with primitive blocks in a “bottom-up” manner like “LEGO” bricks. These blocks are visualized on the printed marker cards that allow users to manipulate (rotate, translate, etc.) them in the same way of manipulating real building blocks. User studies have been conducted and we have identified some aspects that help people to model 3D objects.

VI. CONCLUSION

Hence in this paper method they have used the pipeline method for live texturing. Our main aim was to understand the strategy of the projections of images and their 3-D rendering. We in our project want to create an application for an educational purpose. This app would be an interesting approach to gathering information and a fun way of gaining knowledge. So the plan is to make an application that displays information in an animated 3-D form along with text and audio options, when image of an artefact is captured .Here it is for a museum scenario but the concept can be applied elsewhere too.

REFRENCES

[1.]Stephane Magnenat, Dat Tien Ngo, Fabio Z und, Mattia Ryffel, Gioacchino Noris, Gerhard Rothlin, Alessia Marra, Maurizio Nitti, Pascal Fua, “Live Texturing of Augmented Reality Characters from ColoredDrawings”,DOI 10.1109/TVCG.2015.2459871, IEEE Transactions on Visualization and Computer Graphics.

[2] P. Tanskanen, K. Kolev, L. Meier, F. Camposeco, O. Saurer, and M. Pollefeys, “Live metric 3d reconstruction on mobile phones,” In IEEE International Conference on Computer Vision, pp. 65-72, 2013.-Study of 3D Reconstruction.

[3] G. Klein and D. Murray, “Parallel tracking and mapping for small AR workspaces,” In IEEE International Symposium on Mixed and Augmented Reality, pp. 225-234, 2007. – AR Mapping and Display Resolution.

[4] J. Engel, J. Sturm, and D. Cremers, “Semi-dense visual odometry for a monocular camera,” In IEEE International Conference on Computer Vision, pp. 1449-1456, 2013 –Camera Based AR.

[5] T. F. Cootes, G. J. Edwards, C. J. Taylor, “Active appearance models,” In IEEE Transactions on Pattern Analysis and Machine Intelligence, pp. 484-498, 1998.-Machine Intelligence AR.

[6] C. Zach, "Fast and high quality fusion of depth maps," Proceedings of the international symposium on 3D data processing visualization and transmission (3DPVT), Vol. 1, 2008. –Study of Data Visualisation and Transmission.

