ISSN 2395-1621

A Survey On Augmented Reality In The Current Scenario

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ABSTRACT

Augmented Reality (AR) is a growing area in virtual reality research. Recently the game pokemon go brought in augmented reality into popularity but it has been around since years. The concept of combining virtual world and real world is surreal. The world environment around us provides a wealth of information that is difficult to duplicate in a computer. This is evidenced by the virtual environment worlds. Either these worlds are extremely simple such as the environments created for immersive entertainment and games, or the system that can create a more realistic environment is expensive in terms of price such as flight simulators. An augmented reality system generates a composite view for the user. It is a combination of the a virtual environment generated by the computer and real scene viewed by the user that augments the scene with additional information. In all those applications the augmented reality presented to the user improves the experience and performance of that person's and perception of the world. The ultimate goal is to create a system such that the user cannot tell the difference between the real world and the virtual augmentation of it.This paper deals with how it is now being used in educational background mainly along with so many other fields.

ARTICLE INFO

Article History

Received: 5th January 2017

Received in revised form :

5th January 2017

Accepted: 7th January 2017

Published online :

7th January 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.

Motivation for a lot of projects is drawn from the fact that mobile phones are being over-used for all the wrong purposes and how education needs to get more interesting rather than boring. There is technology available. There are various ideas available. It is just the matter of pulling the right combination off.

Augmentation is already being used for educational purposes. Many ideas have been proposed and many implemented. One such idea is how characters can be virtualy colored so that students get a feel of what color could go the best for their coloring books. This concept 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 aumentation projects. Further section 2 summarizes the literature survey done by us and, Section 3 demonstrates the comparison of algorithms and design and implementation of the system that we are going to refer for our project. At the end our proposed work and conclusion is presented in Section 4.

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. 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 Texture creation and mesh rendering

So, once the 3-D shape of the colored drawing has been recovered from the camera view , the mesh is re-projected onto the plane of the image. This re-projection means a direct mapping between the pixels of the original drawing and the pixels on the image of the colored template. Then the texture for the character mesh is generated using a lookup map. 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.

IV. 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 artifact is captured. Here it is for a museum scenario but the concept can be applied elsewhere too.

REFERENCES

[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 Colored Drawings”,DOI 10.1109/TVCG.2015.2459871,IEEE Transactions on Visualization and Computer Graphics.

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

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

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

[5.] 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.

[7.] Harald Kraemer,Norbert Kanter, “Use and Re-Use Of Data”,©2014 IEEE.

[8.] Victor Adrian Prisacariu,Olaf K ahler,David W. Murray,Ian D. Reid, “Real-Time 3D Tracking and Reconstruction on Mobile Phones”,2015 IEEE Transactions on visualizaion and computer graphics.

[9.] A. Baumberg, “Blending images for texturing 3D models”, In British Machine Vision Conference. Vol. 3, pp. 5, 2002.

[10.] Hyungil Kim , Jessica D. Isleib , and Joseph L. Gabbard"Casting Shadows: Ecological Interface Design for Augmented Reality Pedestrian Collision Warning", 2016

[11.] T. Miyashita, P. Meier, T. Tachikawa, S. Orlic, T. Eble, V. Scholz, A. Gapel, O. Gerl, S. Arnaudov, S. Lieberknecht, "An Augmented Reality Museum Guide",IEEE International Symposium on Mixed and Augmented Reality 2008.

[12.] Dario o Cianciarulo, “From local traditions to "augm mented reality". The MUVIG Museum of Vigggiano (Italy)”,Procedia - Social and Behavioral Sciences 188 (2015).

[12.] Sasithorn Rattanarungrot ,Martin White,"A Service-oriented Mobile Augmented Reality Architecture for Personalized Museum Environments",2014.

[13.] Victor Adrian Prisacariu,Olaf K ahler,David W. Murray,Ian D. Reid,"Real-Time 3D Tracking and Reconstruction on Mobile Phones",Ieee Transactions on Visualization and Computer Graphics,2015.

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

