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Augumented Reality Based Application for 3D Interface

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ABSTRACT

In this paper, we 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. 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, the first report on a video see through 3D augmented reality display has been experimentally demonstrated with a micro integral imaging display system. The proposed 3D system has potential to be applied to AR system due to its small form factor. In our project we are implementing application level interface as well as 3D display of Chemistry information of Molecules and Molecular Structure as well as their respective images in 3D.

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I. INTRODUCTION

Augumented Reality domain is becoming vast day by day. The advancement in Augumented reality are increasing. This domain is used various fields like industry , construction , education , commerce , medical , etc. Augumented Reality can be used for education purposes for making studies more interactive and easy to learn . Using Augumented Reality for studying chemical structures is one of its use.

Application for learning Chemistry using 3D modelling and Augumented reality will let studying molecular structure and reactions. The complex subject like Chemistry is studied very easily using 3D modelling. Application comprises of 3D modelling with Augumented Reality.

II. PROBLEM DEFINITION

Augmented Reality (AR) is a growing area in virtual reality research. The world environment around us provides a wealth of information that is difficult to duplicate in a computer. This is evidenced by the worlds used in virtual environments. Either these worlds are very simplistic such as the environments created for immersive entertainment and games, or the system that can create a more realistic environment has a million dollar price tag such as flight simulators. An augmented reality system generates a composite view for the user. The process of superimposing digitally rendered images onto our real-world surroundings, giving a sense of an illusion or virtual reality.

III. EXISTING SYSTEM

Existing system uses AR Markers in application. In existing system . We have to download application by purchasing it from google store. The purchasing of app is

costly. Students usually prefer the applications that are free of cost. Hence this adds to limiting the use of system.

IV. PROPOSED SYSTEM

Proposed system is developed to make chemistry subject more interesting and interactive. In this paper, we propose a system that will develop molecular structures of chemistry. Proposed system will show reaction between reactants and products. Also, our proposed system will be able to provide information regarding the chemicals.

V. LITERATURE SURVEY

SR.NO	AUTHORS NAME	FEATURES	YEAR
1	Sucai, Xu Wang, Feng-kuang	3D model of micro particles using markers.	2014
2	P.Maier, G.Klinker	Direct Manipulating Physical Objects.	2013
3	P.Tanskanen, K.Kolev, L.Meier,	Study of 3D Reconstruction	2013
4	J. Engel, J. Strum, D. cremers	Camera Based on AR	2013
5	C. Zach	Study of visualization and transmission	2008

VI. PROPOSED ARCHITECTURE

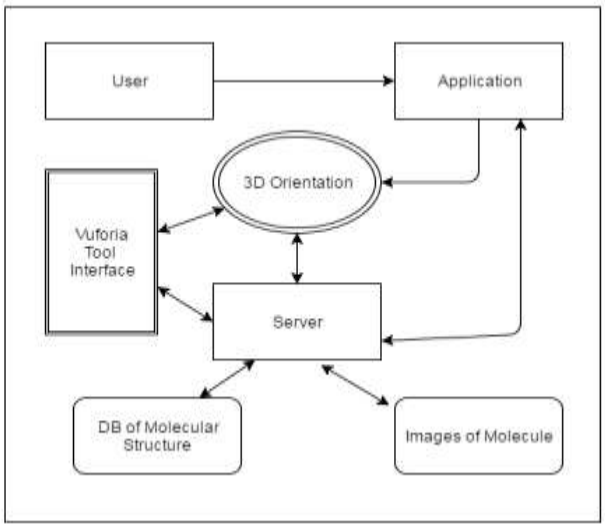

Fig 1. System Architecture

Above figure illustrates architecture of the proposed system. The proposed system has Vuforia tool interface ,database, server. Vuforia supports 3D recongnition of image. Vuforia is used in proposed system as it scans real objects.

For application generate license key from Vuforia website. Initiate Vuforia and permissions required for the application. After acquiring the permissions from Vuforia open Camera of device. When Camera will open capture single frame from device Camera. An image will be captured. Extract features of the image. After feature extraction plane detection is performed on the image. Image in database is compared.

If image is not compared again perform plane detection. If image is found in database then we can say that it is correct image. A 3D data is found. If 3D data is not found then compare image in database. But, if 3D data is found in database then we will carry 3D compilation.

The 3D data that we found in database will be placed on the calculated plane. After compilation show the compiled data. Here we have performed feature extraction ,image plane detection ,and 3D data compilation. If camera is open we can capture next frame and perform the procedure again.

VII. HARDWARE AND SOFTWARE REQUIREMENTS

Operating System : Windows 7 Ultimate
Coding Language : Csharp
Front End : Vuforia toolkit
Data Base : Vuforia
System : Windows, 7, 8, above
Hard Disk : 40 GB
Monitor : 14' Colour Monitor
Mouse : Optical Mouse
Ram : 1 GB

VIII. FLOW CHART

The flowchart given below illustrates the procedure to generate chemistry related structures.

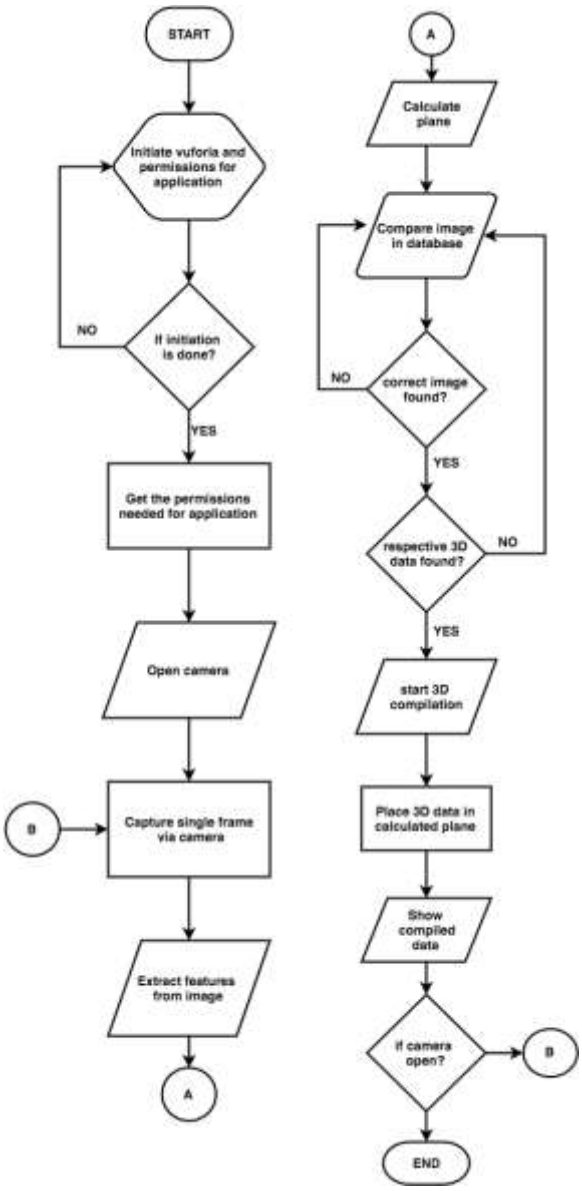

Fig 2. Proposed flow diagrams

IX. CONCLUSION

Using Augumented Reality , an application that guides students to learn chemistry in an interactive way will be developed. This application will help students to learn molecular structures , chemical reactions and information about it. This application will not require any purchasing. Thus, application is cost effective.

We can further extend our application by differentiating acid and bases in chemistry laboratories .

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