

Interactive Holographic Display With Augmented Reality

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Abstract- *In this paper, we propose a system for a real-time learning purpose interactive holographic display. which is used by augmented reality (AR). The 2D images give new perspectives to the students to understand certain Subject or topic freely and fundamentally. This model will help in learning the student or we can say it will be used for educational purpose. Now a days due to pandemic students taking classes online so in this pandemic it will be very useful for students. AR in education helps students achieve better results through visualization and full immersion in the subject matter. So, instead of reading theory about something, students can see it with their own eyes, in action. Practical learning. Our paper is aimed to ease the preceptors to deliver the knowledge to the students as well as to hand self- learning for the students. Here Augmented Reality doesn't replace the reality as with Virtual Reality but it adds a video content to the real world. We are going to make a 3D model with the help of Vuforia software tool kit and we will present that model with the help of projector in 2D form and it will look like hologram. Interactive holographic using AR for more interactive with objects. Using AR it will be more effective and it allows users to see themselves in the virtual world.*

Keywords- Projector in 2D form, speaker, augmented reality.

I. INTRODUCTION

The advancement of augmented reality (AR) and holographic display technologies improve teaching and learning process. An Interactive Holographic Display is introduced, which is aimed to ease the teachers to deliver the knowledge to the students as well as to provide self-learning for the students. The Proposed solution is implemented using the AR technique and fused with 3D holographic projector. We are going to make a 3D model with the help of Vuforia software toolkit and we will present that model with the help of projector in 2D form and it will look like hologram. The displayed content consists of animation and also the audio explanation about a certain topic.

The AR lamp projects interactive animated content. And it also gives audio explanation of that content and

glasses-free augmented reality device that creates optical 3D illusions directly in the user environment, is bringing to market new real-life applications for restaurants and real estate. It projects the illusion of 3D with the capability to see the virtual objects The device also allows natural interactions with the user's hands, so that he can zoom in and out to see specific details, change the materials and manage 3D assets by simply gesturing his hands.

This technology is changing the game in AR by removing any wearable equipment that constrains the user, and by removing any barrier that traps the 3D content into devices like screens or VR headsets. Using this model the 3D content exists directly in the user environment. model combines real objects with its own effects to create a mixed reality environment. To accomplish this, it uses multiple cameras, a pico or LCD projector, video capture and face tracking to know where the viewer is at all times. The device then alters the 2D images that users see to give the illusion of a 3D

This model is a tabletop projector that projects 3D images right into your environment. In other words, it promises the possibility of augmented reality, without making you wear something. This takes the power of our brain and the power of new pico projectors, video capture and face tracking technology to allow us to know where the viewer is and alter the image they are seeing so that the 2D projection they are viewing behaves as if it was 3D.

II. LITRATURE REVIEW

[1] A Low-cost Approach Towards Streaming 3D Videos of Large-scale Sport Events to Mixed Reality Headsets in Real-time:

In comparison to standard screens, watching sporting events in 3D rather than two-dimensional video streaming provides for greater immersion, e.g. via mixed reality headsets. Until now, recording 3D video of sporting events has necessitated costly outside-in tracking with multiple cameras. Using only inside-out tracking and low-cost technology, this

study shows that transmitting sports footage to mixed reality headsets as holographs in real-time is possible. Our method is demonstrated by broadcasting a race car on an indoor circuit as 3D models, which are subsequently rendered in the Magic Leap One headset. The video stream needed to localise the race car via computer vision is provided by an onboard camera installed on the race car.

[2] Holographic Projection of 3D Realistic Avatar That Mimics Human Body Motion:

They created 3D Avatar Model which performs human body movements. For modelling of 3D avatar they made character sketch of that avatar model which was 2D picture concept art. Then they applied bones to the model which was main part for their animation character. For holographic projection of 3D avatar model they used pyramid hologram. Non-realistic avatar and environment representations are extensively utilised since they are quicker and less expensive to create while requiring less computer power. Because there were no relevant behavioural cues, there was a low level of interaction between the user and the viewer/s. The goal of this study is to create a 3D realistic avatar that can simulate real-time human body movement. The usage of Kinect V2, which allows a 3D model to follow the movement of a person standing in front of the Kinect sensor, allows the 3D Avatar to mimic human body movements. A projector, two mobile devices, a speaker, and a pyramid hologram are also included in the system, which should offer a 3D hologram show.

[3] HoloR: Interactive Mixed-Reality Rooms:

They used HoloR which contains one projector and one tracking device. Each camera is connected to an Intel NUC i5 and communicates its tracking data through UDP to the rendering machine. They discussed so many things such as projection of gray code for gathering correspondences to the camera's 3D point. They selected 5 applications for demonstration of new added values with dimensions of collaboration. Virtual reality technologies now available only represent specific aspects of the mixed-reality spectrum: Head-mounted displays make it difficult to engage with the real environment, while augmented reality goggles are inadequate to give immersion. We introduce HoloR - short for Holographic Room - in this paper: A stereoscopic, multi-person, multi-viewer, spatial projected augmented reality system, which enables applications to blend between different parts of the mixed-reality spectrum. HoloR's operation does not require any installation or compilation due to the use of online technologies such as JavaScript and Web GL, allowing for rapid development of applications and extensions. Various

examples of applications are presented, ranging from collaborative data discovery to augmented people and ambient information systems.

III. PROPOSED SYSTEM

A) AR using unity vuforia kit :

we are going to use unity kit that is used for AR and inside that we have installed vuforia software. Vuforia is a mobile augmented reality software development kit (SDK) that allows developers to create augmented reality apps. It recognises and tracks planar pictures and 3D objects in real time using computer vision technologies. Vuforia employs an edge-detection method. If the high-contrast image has more vertices or lines, it is a Vuforia image with a high rating. This software is used for making 3D objects. So using this software we are going to make 3D images or video so using projection it will be display on desk.

B) LCD Projector :

In this model we are going to use projection using AR .An LCD projector is used for displaying video, images or computer data on a screen or other desk. LCD projectors often create images that are brighter and more vivid. Projected AR is a form of augmented reality in which digital projections are physically superimposed on the real world. This enables AR to employ a technique known as projection mapping, in which the projected image is transferred onto physical objects, resulting in direct digital overlays. This model with the help of projector in 2D form and it will look like hologram.

C) Speaker :

In this model we are going to use speaker for audio explanation about certain topic or images. So when we insert any digital content or images then using projector it will be display on desk and using speaker it will give audio explanation about the content. If we use this model for educational purpose with audio explanation it will be immersive learning for students.

IV. FUTURE SCOPE

- The Interactive Holographic Display is one of the starting point to revolutionize the holographic application with user interaction using AR technique, such as can improve the enjoyment and efficiency of the student toward learning and allows them to actively participate in the classroom.

- In the future research, the usability evaluation of the proposed system is planned to conduct in order to collect the users' experience, especially the students and the teachers, in order to improve the 3D holographic display technology using AR in the education field

V. CONCLUSION

This paper discusses the holographic display using the augmented reality and vuforia unity kit for making 3D images. So that images display on desk or any surface using projector and it has audio explanation as well.

VI. ACKNOWLEDMENT

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