

IMPACT OF AUGMENTED REALITY ON CURRENT - DAY

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ABSTRACT

The authors designed a kind of augmented reality annotation system based on network knowledge collaboration for primary science education to expand the cognitive effect. Various types of annotations such as text, images, videos, links, 3D models, etc. can be added to the corresponding position of the paper book by multi- user and multi-device through the system. And the annotation contents could be retrieved in AR mode by other users. The connotation and dimension of scientific knowledge could be expanded through concentrating diversified annotations. The system only records the relative position of the annotation on the page by a hand-aided registration, and uploads the location information to the server without infringing the copyright of the book. The system allows users to add links as annotations, through which users could interact with social media and knowledge communities. By using this system, users' ideas could be connected thus promote the flow of knowledge between different types of readers (such as students, parents, and teachers), readers and authors and it is conducive to the exchange and inspiration of ideas, promoting the integration of knowledge and the generation of group wisdom

Keywords: *Collaborative system, knowledge collaboration, augmented reality, annotation, science education*

I. INTRODUCTION

Today, rapid changes and advances in science and technology affect and change the lifestyle individuals. Apart from individuals, it is not possible for The education process and educational environments not to be affected by this change. when the technologies used in educational environments from the past to the present are examined, it

is seen that there is a transformation from blackboard and chalk to the computer and internet world, even to smart technologies with artificial intelligence. Especially in recent years, computer and internet technologies have had such a wide area of use in our lives that it was unthinkable for education Services to be left out of the field. The definition of today's learners as digital generation require educators to follow technological developments and use the most appropriate technological tools in learning environments. One of these new technologies is augmented reality applications in education. when the literature is examined, there are many definitions of the concept of augmented reality. made by researchers. some of these definitions are Augmented reality according to Milgram and Kishino, " it is a reality environment where digital media products are used instead of real world objects " appears to be the most general definition. According to Azuma, augmented reality is a derivative of virtual reality. According to this definition, augmented reality is virtual environments. in which existing reality is supported, not created from scratch. Augmented reality creates the interactive environment between the virtual and real world.

II. METHOD AND IMPLEMENTATION

2.1 Design Background

On today growing world, the need for improvement and innovation has become an absolute necessity and we here to come up with a new methodology to provide students with a better, new and innovative understanding in their field of study.

We have developed complete application which uses augmented reality as its core foundation to enhance the understanding of laboratory equipment of our department. Students will have a brand-new opportunity to understand the equipment present in their laboratory.

so, the basic designing of the application is done using unity 3D whose space-time environment has been used. the application will augment the list of equipment that are handpicked by us in this particular project for demonstration

- DC Regulated Power Supply
- Digital Storage Oscilloscope
- Function Generator
- 8085 Microprocessor
- 8086 Microprocessor
- AM Receiver
- FSK Modulation and Demodulation
- Ammeter
- Voltmeter
- Pic Microprocessor
- RL78 Microprocessor
- IC Trainer Kit

These are the list of equipment that we have currently provided in our application. Each and every object among these will augment and provide us with the information as well as description when invariably.

2.2 System Technology Logic

UNITY 3D

A kind of mark-free augmented reality was designed and utilized in this system. Unity 3D software(<https://unity.com/>) has been used for the main interface and the AR scene of the application. Enabling us to utilize the full potential of the 3D environment and help us create and grow real-time 3D model augmentable application. Unity 3D allows developers to merge real-time software into the world of augmented reality.

BLENDER

The next software that is being used in the project is BLENDER (<https://www.blender.org/>) blender is public project hosted software which is free and open-source 3D creation suite for modelling, animation and more. The use of blender is an essential requirement for the development of the real-time 3D model generation. The information and visual details about the equipment present in the laboratory are gathered manually and creation of 3D models using the specification are done.

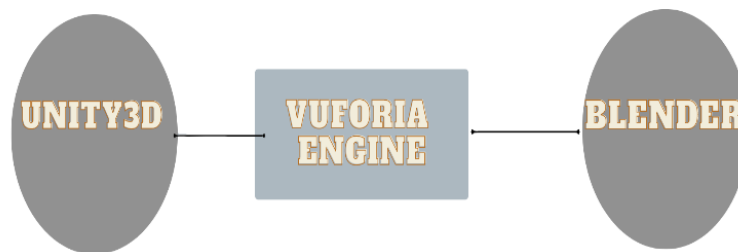
VISUAL STUDIO

Visual studio code is used for providing functionalities by adding C# scripts onto the button components. These enables the buttons move forward and backward in between the scenes effortlessly and the script also been used for the merge and collapse different canvas of the different equipment panel since all of the objects are being separated by separate canvases.

VUFORIA DEVELOPER PORTAL

The Vuforia engine developer portal (<https://developer.vuforia.com/home-page>) provides free and open-source resources to work on augment reality. It also act as a platform for storing the 3D models and images into its database and provide augmentable features to the uploaded resources as well as later downloading it directly into the unity engine.

Fig.01 Flow chart explaining the process



2.3 The System’s Practical Model

The system starts with an interface created using unity 3D software which contains of the basic start and quit options. Upon entering the application and AR camera using the device is launched and pointing the AR camera towards any of the listed equipment above a canvas containing information, description and component panel is generated . The idea of the project is to ease the manual labour works and the need for a guides Constant supervision .



Fig.02: AR Generated Model

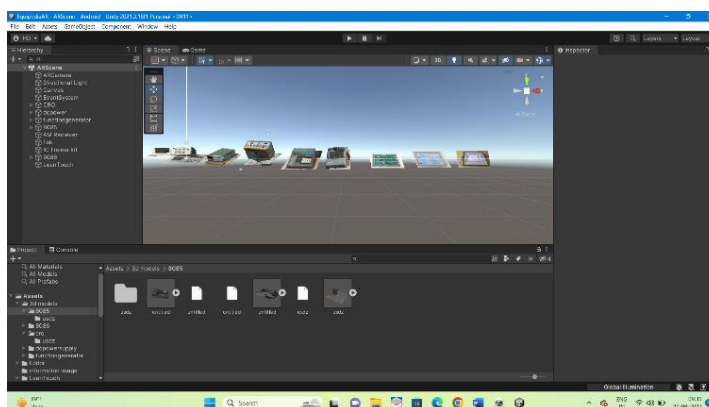


Fig.03: AR Open View

The system provides readers with two modes of operation: the “add” mode and the “read” mode. In the “add” mode, readers can add AR annotations to this page. The readers should enter the page number. Then they can choose the position on the page where they would like to add annotations. The system will store the information of the position and the page number with the annotations in the server. It has no difference from which people add notes on electronic books today. But this kind of notes can become part of the AR annotations which is attached to the page, and can be viewed by other readers. If readers hope to connect certain contents in this page with images, videos, 3D models, etc., it's just as easy as adding a note. And readers can put the virtual content where they feel most appropriate. Additionally, readers can also add links to the pages, which lead to images or videos, etc. Moreover, adding link annotations which from social media are beneficial to unearthing discrete knowledge in the social network community. Most importantly, the system supports adding "questions" or adding "answers" to questions in the appropriate locations by adding annotations, because of educational needs. In read mode, readers can read the page along with the AR contents attached to this page by other readers in an AR displayed way. The annotations simply overlay on the page, and the interface button.

2.4 How AR in education works

AR is part of a larger Extended Reality (XR) concept, which also includes VR and MR technologies. Augmented reality enhances the real-world environment with text, sound effects, graphics, and multimedia. In other words. AR brings us an enriched version of our immediate surroundings by layering digital content on top of the graphic representation of the real world.

The hardware for AR learning may be pretty basic, such as smartphone cameras for playing a popular PokemonGo game. Yet, the hardware in AR glasses like Google Glass, Dream Glass, and Vizux Blade are arguably more convenient for delivering AR to consumers.

However, the AR content is generated with AR software, which is still mostly developed for a specific AR-hardware vendor and often sold with an AR hardware kit. Augmented reality in education and training has a wide array of uses and enables its adopters to learn-on-the go using real-time instructions.

2.5 An Augmented Reality in Classroom

Probably, the most popular application for augmented reality in education is the use of AR apps directly in the classroom. In this case, they can help the teacher explain a subject, provide a visual representation of the material, and help students test out their knowledge in practice.

Namely, you can find an AR app for almost any subject, including chemistry, geometry, zoology, grammar, and even programming will prompt you to read. Readers can click on "Like" to comment on annotations, and they can also choose to hide certain components.

When book authors use the system, they can focus on their works. Authors can complete an authentication in the system and bind the accounts with their works. Then authors can get information about the book in the system,

including all the information provided for readers mentioned above and other comments on this book by other registered authors. Then authors can view all the AR contents added by readers, and find what's useful to them in their following works. Authors can interact with readers by using the system. If they hope to answer questions left by users, it's simple to just add the answers or the supplement like the notes added by readers to the pages. All the notes added by authors will be highlighted, so readers will notice the difference and pay special attention to authors' works.

2.6 Result

The application Equipedia AR is developed by us which can be used by any user having android version more than android 6.0 Marshmallow which basically means that any phone that are been purchased after 2015 can load and run the application perfectly.

An Equipedia gallery is also attached along with the application which will contain all of the images of the equipment which supports augmentation on its real time 3D models as well as its 2D depiction. The goal is to provide students with the better facility on studies using augmented reality as the foundation.

All the user has to do is deploy the application on their mobile and point the AR camera towards the real time objects that needs to be augmented. An information panel along with description of the object will be enabled on the screen which can be accessed used its respective buttons on the canvas.

The impact of augmented reality in the field of education can provide enormous growth, facilities and improve the state of education to a new level.

III. CONCLUSION AND DISSCUSION

The paper utilizes essential topics necessary for the development of toolkits related to AR simulations in the fields of Education. Our first step in the making of the following project Equipedia AR enhances the understanding of the same. The combination of collaborative technology and augmented reality technology in the field of paper book annotation makes it an interesting technology in the field of book reading and education. There will be application prospects not only for primary school science education books, but also for many public books and bestseller books.

REFERENCES

- [1] D. N. Nasser, "Augmented Reality in Education Learning and Training," 2018 JCCO Joint International Conference on ICT in Education and Training, International Conference on Computing in Arabic, and International Conference on Geocomputing (JCCO: TICET-ICCA-GECO), Tunisia / Hammamet, Tunisia, 2018, pp. 1-7, doi: 10.1109/ICCA-TICET.2018.8726192.
- [2] S. Sarkar, A. S, A. V and D. K, "Exploration and Aspects on Augmented Reality," 2022 International Conference on Power, Energy, Control and Transmission Systems (ICPECTS), Chennai, India, 2022, pp. 1-6, doi: 10.1109/ICPECTS56089.2022.10047434.

- [3] C. W. M. Leão, J. P. Lima, V. Teichrieb, E. S. Albuquerque and J. Kelner, "Altered reality: Augmenting and diminishing reality in real time," 2011 IEEE Virtual Reality Conference, Singapore, 2011, pp. 219-220, doi: 10.1109/VR.2011.5759477.