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Augmented Reality in Education System

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Abstract: ***In today's classroom delivering education and providing crystal clear explanation is very difficult some concepts student feel difficult to understand because of no virtual experience that how exactly things work which they are studying . Textbooks are the major source of getting knowledge for students but the only problem in textbooks are 2D diagram present in the book , for students it is very difficult to understand the working of any diagram for example human heart that how exactly it looks and function because of no virtual experience. To solve this issue a concept called augmented reality for education system came into the picture.***

Augmented Reality creates wondaful opportunities for college teachers and even for student also to grasp the abstract concepts. With the help of interaction and experimentation that Augmented Reality technologies offers , faculties can enhance offline experience in the classroom, teach new development skills, enhance students minds develop interest in students minds for studies . As of know the most popular application for augmented reality in education is the use of augmented reality apps directly in the offline classroom, where teacher can explain the subject can provide the visual representation of the material and can help students also . The current state of augmented reality in education is examined in this chapter from a variety of angles, including the accessibility of various technologies, the different types of augmented reality learning experiences, the authoring tools available, the appropriate audiences the subject, and the state of augmented reality research in education.

Keywords: Augmented Reality, Virtual reality, Vuforia, Unity 3D, Education System

I. INTRODUCTION

In the current college system majorly in most of the colleges there is no way to provide virtual experience of the educational content. This process is done manually by referring 2D images in the textbooks or diagrams drawn by teachers on the teaching board. This would be a bigger issue as it would create clashes when teachers are delivering lectures and because of no virtual and 3D experience of the content it's become very difficult and problematic for students to grasp the abstract content. A user can interact with the navigation and this environment and with both real and virtual objects

II. LITERATURE SURVEY

Nor Farah Said in, Noor Dayana Abd Halim, Noraffandy Yahaya "A Review of Research on Augmented Reality in Education: Advantages and Applications", International Education Studies Technology in education can influence students to learn actively and can motivate them, leading to an effective process of learning. Since its introduction, augmented reality (AR) has been shown to have good potential in making the learning process more active, effective, and meaningful. This is because its advanced technology enables users to interact with virtual and real-time applications and brings natural experiences to the user [1]

Mehmet Kasim, Yasin Ozarslan Augmented Reality in Education: Current Technologies and the Potential for Education Procedia - Social and Behavioral Sciences . Although the physical world is three-dimensional, mostly we prefer to use two - dimensional media in education. The combination of AR technology with educational content creates a new type of automated application and acts to enhance the effectiveness and attractiveness of teaching and learning for students in real-life scenarios[2]

Cecilia Avila-Garzon, Jorge Bacca-Acosta, Kinship, Joan Duarte, Juan Betancourt Augmented Reality in Education: An Overview of Twenty-Five Years of Research, Contemporary Educational Technology . Research on augmented reality (AR) in education is gaining momentum worldwide. This field has been actively growing over the past decades in terms of the research and development of new technologies [3]

Manoela M. O. da Silva, João Marcelo X. N. Teixeira, Patrícia S. Cavalcante & Veronica Teichrieb Perspectives on how to evaluate augmented reality technology tools for education: a systematic review Journal of the Brazilian Computer Society 25 Education has benefited from augmented reality's (AR) potential to promote interactive experiences both inside and outside the classroom. A systematic review was conducted on how AR's impact on the learning process has been evaluated. selected papers from 2009 to 2017 in three databases, IEEE, ACM, and Science [4]

Mustafa SIRAKAYA , Didem ALSANCAK SIRAKAYA Trends in Educational Augmented Reality Studies: A Systematic Review, Malaysian Online Journal of Educational Technology Date This study aimed to identify the trends in the studies conducted on Educational Augmented Reality (AR). 105 articles found in ERIC, EBSCOhost, and Science Direct databases were reviewed with this purpose in mind. Analyses displayed that the number of educational AR studies has increased over the years. Quantitative methods were primarily preferred in those articles and educational AR was often found to be used in science education (physics, chemistry, and biology), engineering education, and medical training [5]

A. Analysis of Literature Survey

1) In the classroom, augmented reality has the potential to encourage students to participate more actively in their learning, resulting in a more efficient learning process. The potential for augmented reality (AR) to make the learning process more dynamic, effective, and relevant has been established. Users can interact with virtual and real-time apps using advanced technology, which provides them with natural experiences.

2) Although the physical world is three-dimensional, we often prefer to teach with two-dimensional media. A new sort of automated application is created when AR technology and instructional content are combined.

3) In real-life situations, augmented reality technology improves the effectiveness and appeal of teaching and learning.

4) In terms of research and development of new technologies, augmented reality (AR) in education is gaining traction around the world

5) AR's ability to promote engaging interactions both inside and outside the classroom has helped education. The impact of AR on the learning process was investigated using a systematic review.

III. WORKING

The proposed augmented reality application is made with a variety of technologies. Using iClone Character creator , the character design and animation are first produced . The purpose of character which was developed using iClone is to finish the three-dimensional gaming character for mobile, AR and VR developers. Except the character the second design of each section objects he's made in Maya3D . Several objects can be created, designed and render using the modelling and animation programmed Maya3D. The position for each segment, the schedule for animations, and the utilisation of the AR foundations were all scenes created using Unity3D. A gaming engine called Unity3D can produce effective and potent AR and VR experiences.

For creating augmented reality applications for iOS and Android, AR fundamentals combines the ARCore and AR Kit technologies. It allows for the recognition of 2D and 3D markers as well as vertical and horizontal planes

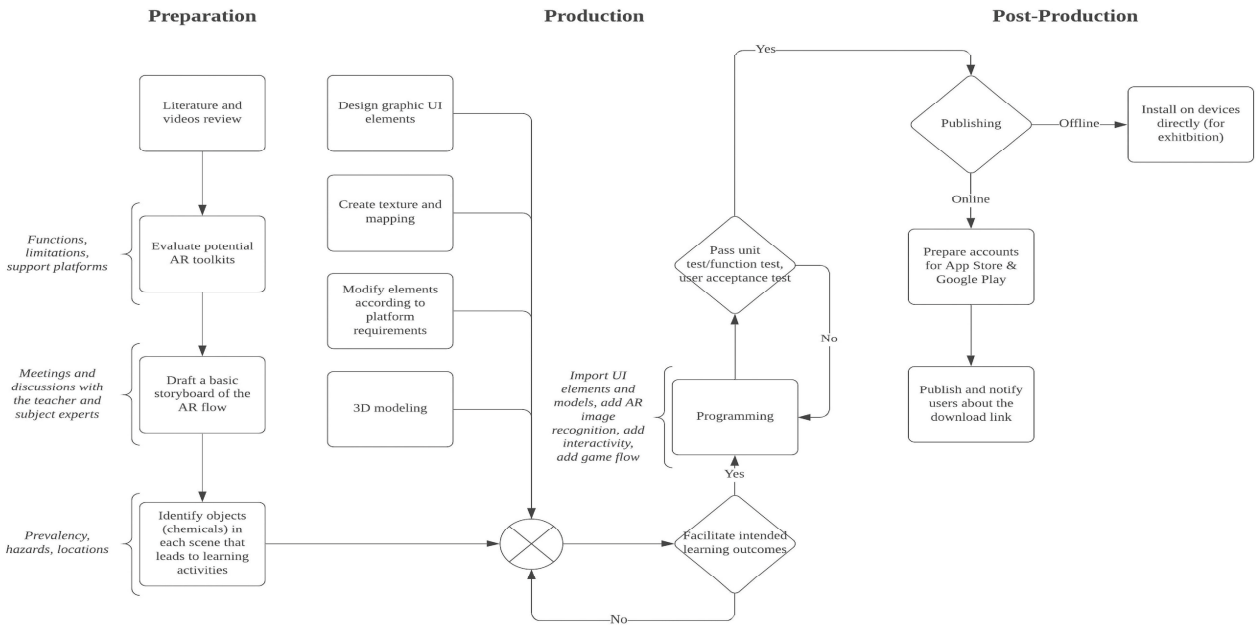

Fig.1 Block Diagram of Augmented Reality in Education System

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The System consists of three part preparation, production and post – production where preparation part consist of draft of the storyboard of the AR flow then it will identify objects in each scene . Production part consist of importing UI elements , adding AR image recognition and interactivity at Last Post Production part consist of publishing the material online and prepare accounts for App Store and Google Pay further installation on devices comes into the picture

IV. MODULES

A. Image Tracking

This module would be responsible and the key function of whole augmented reality application it authorizes user to track the gadget position, location, axis and direction in the real existing world, this module helps us to track the image target which has been set during the development of the application and that image target will be used perform the function

B. Scene Understanding

This module would be responsible for understanding the scene which are coming inside the application AR Kit investigate the environment focused by the device's view, then it will rework the scene or provide information on it . all surfaces in the physical environment are identified, including the floor and flat surfaces, is made possible by this. After that, we will be able to set a virtual object on it. Additionally, a virtual item can be illuminated using the light estimation to simulate a real-world light source

C. Object Rendering

SceneKit, Metal and other third-party applications like Unreal Engine or Unity are among the technologies that ARKit employs to process 3D models and display them in your scene.

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V. IMPLEMENTATION

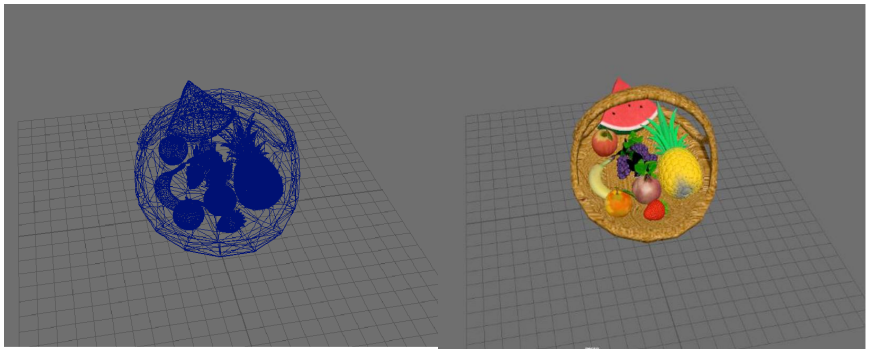

Fig.2 Modeling Object

The above figure 2 each position in this programme has its posseses unique objects, which are created in Maya and exported to Unity in the figure as you can see that the basket fill of fruits has been 3D modelled in Maya

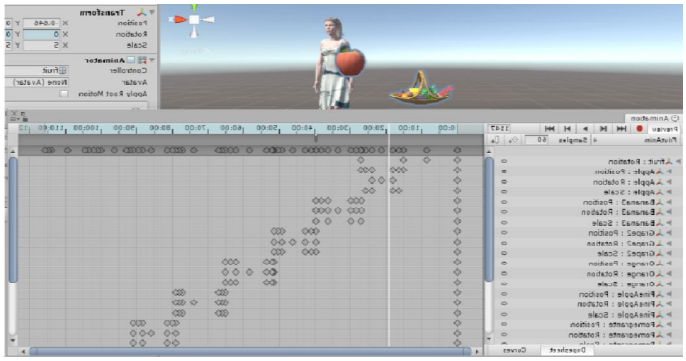

Fig.3 Animating Objects

The above figure 3 shows utilizing the robust animation tools in unity, which you may use to animate objects.

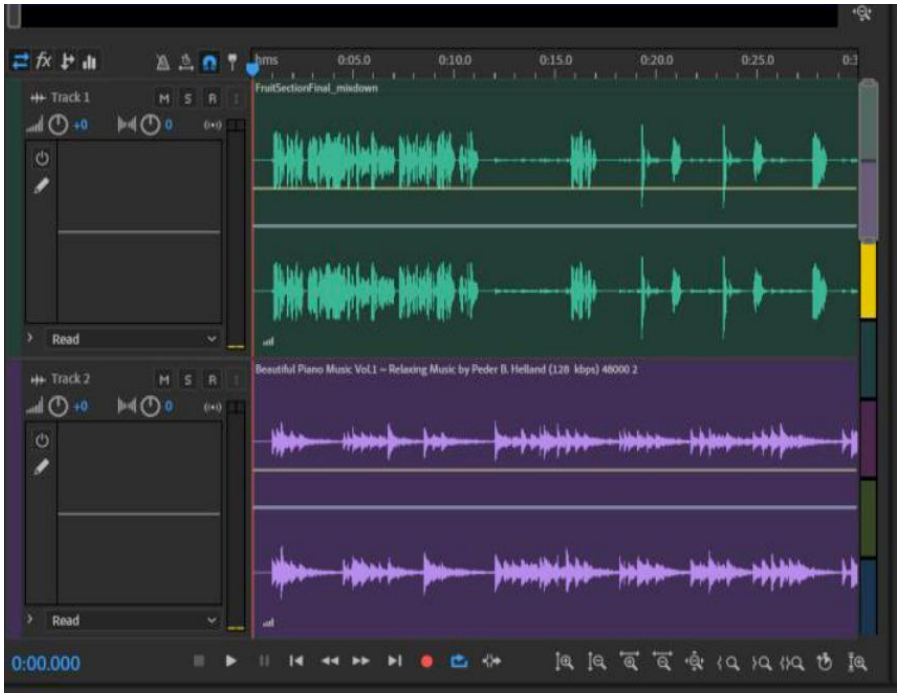

Fig.4 Recording and Editing Sounds

The above figure 4 display the sound waves produced by Adobe Audition after each object in the scene was recorded using the programme, then after editing and effecting to properly correct the scenario.

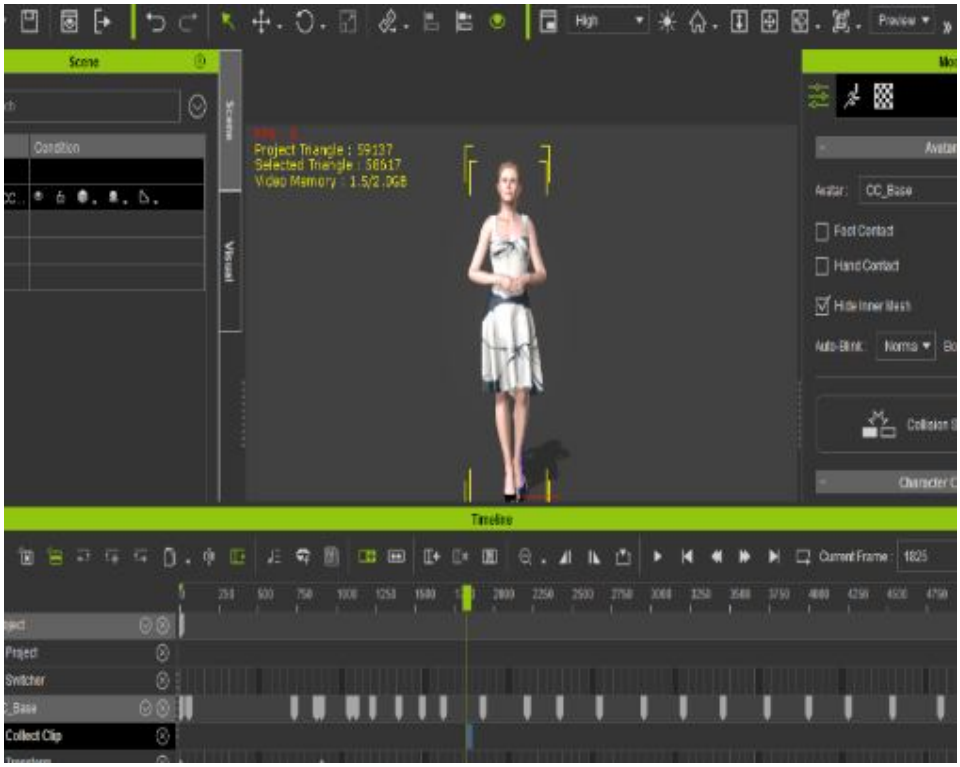

Fig.5 Character Animations

The above figure 5 utilising Maya to rig characters, create characters, and add using the aid of the iClone programme

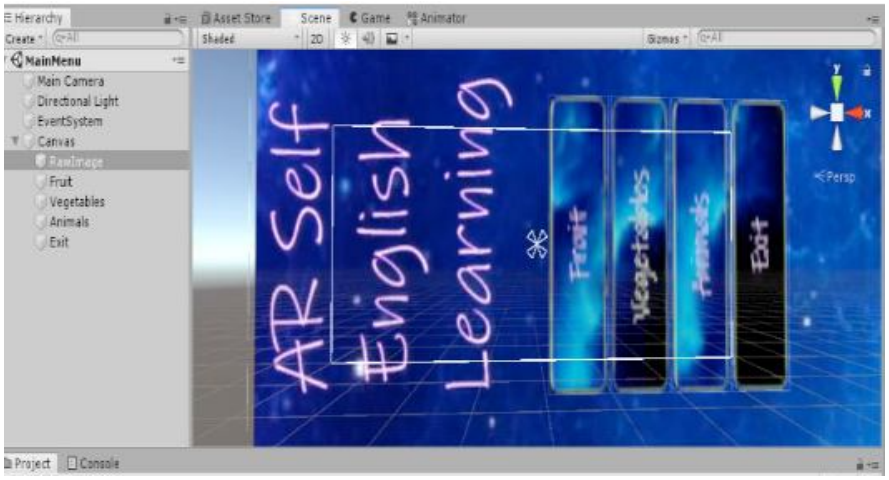

Fig.6 Applications Main Menu User Interface

The above figure 6 constructing the main menu to navigate through the project's various sections with a user-friendly design using the Unity UI component

VI. CONCLUSION

Finally, the development and decrease in cost of hardware have made it possible to run such technologies on devices that are already at our disposal. Present-day technologies like virtual and augmented reality have a wide range of advantages. In particular, it can be difficult to find the supplies, instruments, and equipment needed to create the greatest experimentation objects in educational processes. In this paper, a character assumes the role of the user, saving him time, effort, and money on tuition because he can access his class from anywhere at any time. The conversation section is also crucial because it encourages the user to speak up and break down his or her shame wall because he knows he is speaking to a virtual character rather than a real person, which makes him feel more at ease.

VII. ACKNOWLEDGEMENT

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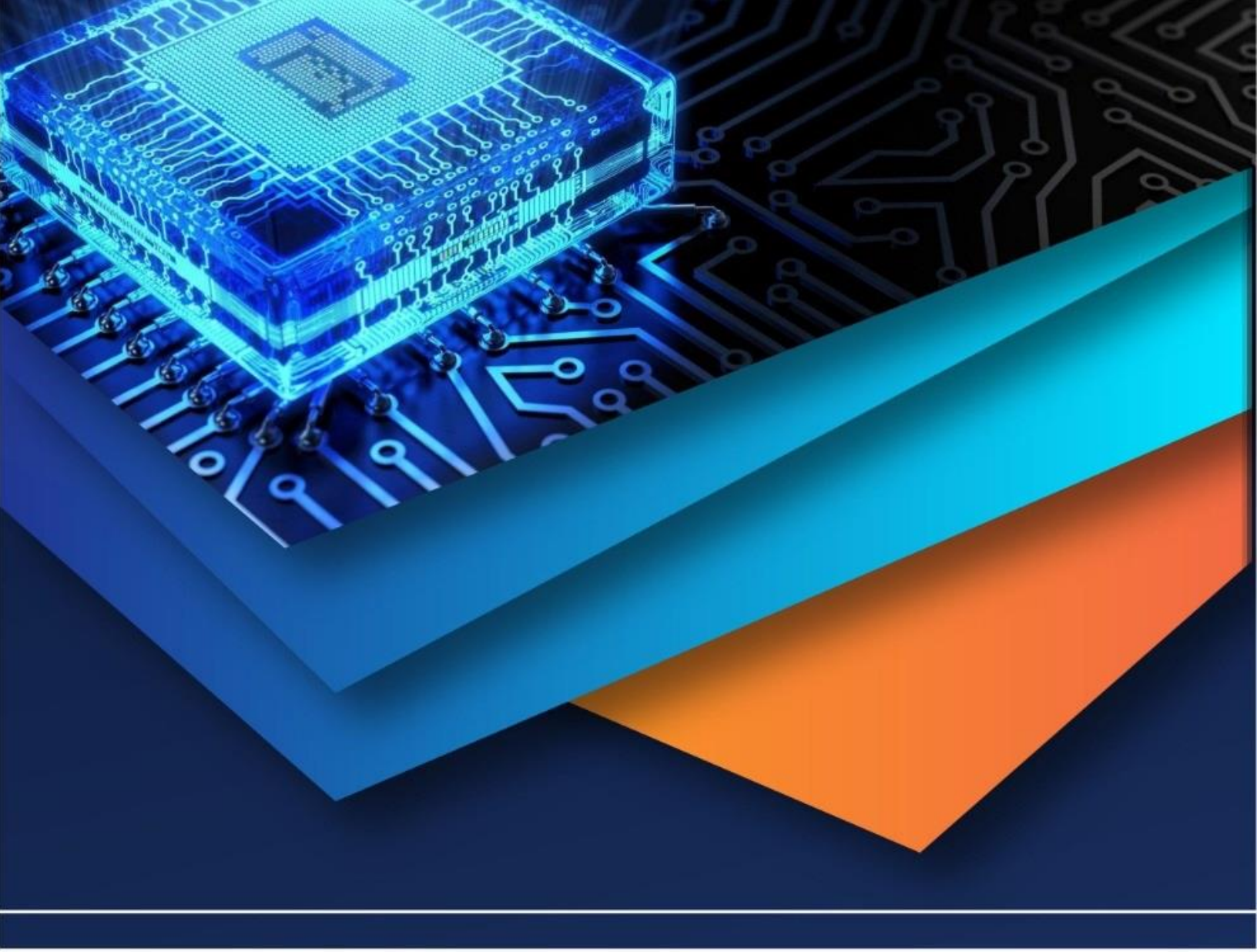

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