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Augmented Reality based Attendee Interaction at Events

Param Jhade[1], Ananya Dubey[2], Dipali Katkar[3], Dr. R. C. Jaiswal[4]
[1, 2, 3, 4]*Pune Institute of Computer Technology*

Abstract: Augmented Reality (AR) was first shown during the 1960s, yet as of late have innovations risen that can be utilized to effortlessly send AR applications to numerous clients. Camera-furnished phones with critical preparing force and illustrations capacities give a modest and adaptable stage for AR applications, while the person to person communication innovation of Web 2.0 gives a huge scale foundation to cooperatively creating and appropriating geo-referenced AR content. This mix of generally utilized versatile equipment and Web 2.0 programming permits the improvement of another kind of AR stage that can be utilized on a worldwide scale.

VR and AR are changing the way that coordinators, patrons, and merchants draw in with participants on occasions. As time passes, innovation keeps on impelling the occasions business higher than ever. Also, among the occasion drifts that keep on molding the space, VR and AR are becoming key impetus for development .In this project, you are attempting to comprehend and actualize the Augmented Reality idea and present existing work on versatile AR and web innovations that could be utilized to make AR applications to build up an Attendee Interaction Model utilizing AR.

I. INTRODUCTION

Virtual and Augmented Reality are changing the way that coordinators, supporters, and merchants draw in with participants at occasions. As time is passing, innovation keeps on driving the occasion business higher than ever. Here, a new idea shows up and it is called expanded reality, the enlarged truth is a blend of the certifiable scenes seen by the client and the virtual scenes delivered by the PC that builds the scene with extra information. The final target is making a framework to such an extent that the user can't discover the contrast between the area of a genuine world and its virtual world. Outfitting such a view to a specialist in the working venue in the working venue will build their presentation and averts the prerequisite of some other apparatuses[1]. The procedure of increasing the truth is only the superimposing of the computerized pictures into this present reality's condition by applying a feeling of augmented reality. The cell phone is utilizing the comparatively applied science nowadays; the assortment of projects utilized in this consequently investigations and makes a virtual picture on the cell phone with the guide of a camera. In basic words, it implies that it profits the camera to set up an edge of pictures.

II. RELEVANCE

[7]AR has been called for many years as a technology that creates transformative interaction in the way people live and work. In distinctive industries such as healthcare, retail and advertisement, solutions that allow overlay laptop photographs to display our immediate surroundings (AR) are increasingly being adopted Working with the Augmented Actuality App Development Company to enhance growing sophisticated apps has been vital as devices get more powerful, science gets higher and more successful in creating higher visuals of first-class. Our understanding of how humans can navigate and interact within virtual or augmented environments will also evolve, leading to the creation of more “natural” methods of interacting and exploring virtual space.

The understanding of how people can explore and communicate inside virtual or augmented environments is also increasing, leading to more "real" forms of virtual space communication and exploration. In the final a number of years, each government and private zone are recognizing the extensive cost of region facts as a platform for extended offerings and enterprise applications. Urban and landscape planning, site visitors monitoring and navigation, road, railway and building construction, telecommunications, utility management, cadaster, real estate market, military applications and tourism are some of the most frequent examples. [5]Very often in a day, individuals prefer being informed of the location of a store, an office, a building, a gas station or a hospital, the fastest way to get home or any other city and street, chances of touring but ready in visitor jams, etc. Technological development seemed to have reached a rate at which current "containers" (GIS, CAD, database) are being used more widely. However, the improvement of a sturdy outside wi-fi AR device is a complicated procedure that involves a large range of one-of-a-kind applied sciences and units to assemble and tune. The aim of this report is to analyze the current popularity of wi-fi outdoor systems to estimate the rate of activity and identify pressing investigation issues. This focuses on methods, systems, units and frameworks that can be used to provide advanced information (in text, audio, sound and graphics structure) to cell customers.

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III. LITERATURE SURVEY

Research has recognized a number of extremely helpful abilities for increased reality advances in the AEC business, for example, computerized site visits, assessing as-manufactured and as-arranged fame of ventures, pre-empting time table debates, improving coordinated effort openings, and arranging/preparing for comparable activities. This paper gives an improved reason for future research by utilizing providing a factual appraisal of enlarged reality mechanical skill in the AEC business. The appraisal depends absolutely on articles decided inside eight broad diaries in design, building, development, and office organization (AEC/FM) until the stop of the year 2012. The assessment moreover limits the writing inside these diaries with the guide of pondering exclusively those 133 articles decided through a catchphrase look for "expanded reality". [8]The picked diary articles are grouped inside the accompanying measurements: improvement center, endeavor division, objective crowd, strategic, and phase of innovation development, application territory, correlation job, and innovation. The amount of articles inside these measurements is utilized to get mindful of developing and rising advancements in the writing as pleasantly as to blend the bleeding edge ultra-current of enlarged truth examined in the AEC business. In synopsis, the AR writing has progressively increasingly centered around the showing of perception and recreation purposes for evaluation of as-arranged versus as-assembled statuses of the mission all through the development segment to uncover adventure improvement and handle issues stood up to with the guide of region laborers. In addition, the future vogue is towards the use of web-based cell augmented structures for subject construction monitoring. It is rather difficult to classify and name the applications and systems that provide such functionality. Some of them are related to the real physical world, others are closer to abstract, virtual, imagery worlds in which gravity, time, space obey different laws. Frequently AR is characterized as a kind of "computer generated reality where the Head Mounted Display (HMD) is straightforward". [4]The objective of increased reality frameworks is to consolidate the intuitive genuine world with an intelligent PC produced world so that they show up as one condition. As the client moves around the genuine article, the virtual (for example PC created) one responds as it is totally coordinated with this present reality. Moreover, the virtual item may move yet at the same time the developments are enrolled concerning this present reality. In the event that this present reality is at one of the parts of the bargains and VR (for example PC created, counterfeit world) is at the opposite end, at that point the AR consumes the space nearer to this present reality. The closer a framework is to the VR end, the more the genuine components decrease. For instance, the AR frameworks utilizing Optical See-through Displays are put nearer to this present reality contrasted with AR frameworks with Video-blending. [3]On the off chance that this present reality can be increased with virtual items, it is intelligent to expect that the virtual world can be expanded with genuine scenes (sees, objects). Such a domain is called expanded virtuality. On the truth virtuality continuum, AV consumes the space nearer to the VR conditions. Since this graph gives a generally excellent outline of the considerable number of frameworks that blend genuine and virtual universes, it turned into a beginning stage for dialogs, arrangements and examinations between various procedures. In the accompanying content, you will in no time talk about the various procedures regarding the connection with AR.

Expanded Virtuality is the strategy that enables a client to investigate intuitively a virtual portrayal of video that is acquired from a genuine space. The video is either seen continuously (anticipated on a virtual item) or chosen surfaces are hung on the virtual articles that compare to the genuine ones. This has the impact of causing a virtual world to show up, to a constrained degree, as this present reality, while keeping up the adaptability of the virtual world. In this regard, the AV world could be seen as a launch of vivid 3D video photos. [2]The remote condition is generally displayed and the administrator still can get a thought of this present reality. To acquire an exact visual picture of the remote working environment, the administrator needs to direction the robot to move around the room. The screen illustration additionally confines the client to be arranged near the robot in the event that he/she wouldn't like to free the association with this present reality. For all intents and purposes, the administrator needs to move the robot to have the option to see the video of the genuine scene.

Data and services offered to the user must be related to geospatial information corresponding to user location – using GPS, WiFi or a vision-based tracked scene, for example – and a geo-database web services. Content authoring can be performed using a desktop computer or directly on the mobile device while on location. Taking advantage of open APIs and Mashups, complex applications can be easily broken down into smaller components and leverage existing online services. Given appropriate sources of geo-referenced data, developers can focus on the user experience of AR 2.0 applications. [6]Specific AR data types can easily be integrated into the XML dialects, and hosted using standard web-based databases, accessible via HTTP. New types of Mashups, which are specifically designed to be consumed by AR clients, can be derived from a mixture of existing (conventional) content and content specifically created for AR. This will include visual objects, other multimedia data, application code and the feature database necessary for local tracking

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IV. AIM

During Events of considerable footfall, a lot of guests are invited or participate in the program. But quite a few times, they are often bored because of unavailability of resources like people, machines to attend them. Waiting process during the Competitions is very tiresome. So, you intend to entertain people during this time with the help of our project.
3D Models of different relevant stuff can be made available for users to get a deeper insight about the event. It can be used as live virtual assistants to guide the guests during an entire event lifecycle. There are many applications of AR in Events but you will be focusing on 3D Modelling and implementing it using Smartphone Applications for IOS and Android for a small subset of Event Lifecycle.

V. OBJECTIVES

A. To increase the Attendee Interaction at any Event by making use of Augmented Reality Technology.
B. We are planning to make the events more entertaining and communicating. So that sponsors would be able to market their brands by actually interacting with users in an unique and entertaining way.
C. An aim to develop the project in which the user can't make a difference between virtual augmentation and the real world of it.

VI. TECHNICAL APPROACH

There are 2 Parts in which this project can be broadly divided :

A. 3D Modelling

Development of 3D Objects of required Characters and exporting it in .obj or .vrx extension is the first task. It requires proficiency in Softwares like Blender or Unity with Vuforia Plugin.

B. App Development

Importing and Placement of 3D Objects into a mobile app is included in this stage. An app have to be developed for Android and iOS. Cross Platform App Development Framework has to be used for efficient development of the app.

VII. BLOCK DIAGRAM

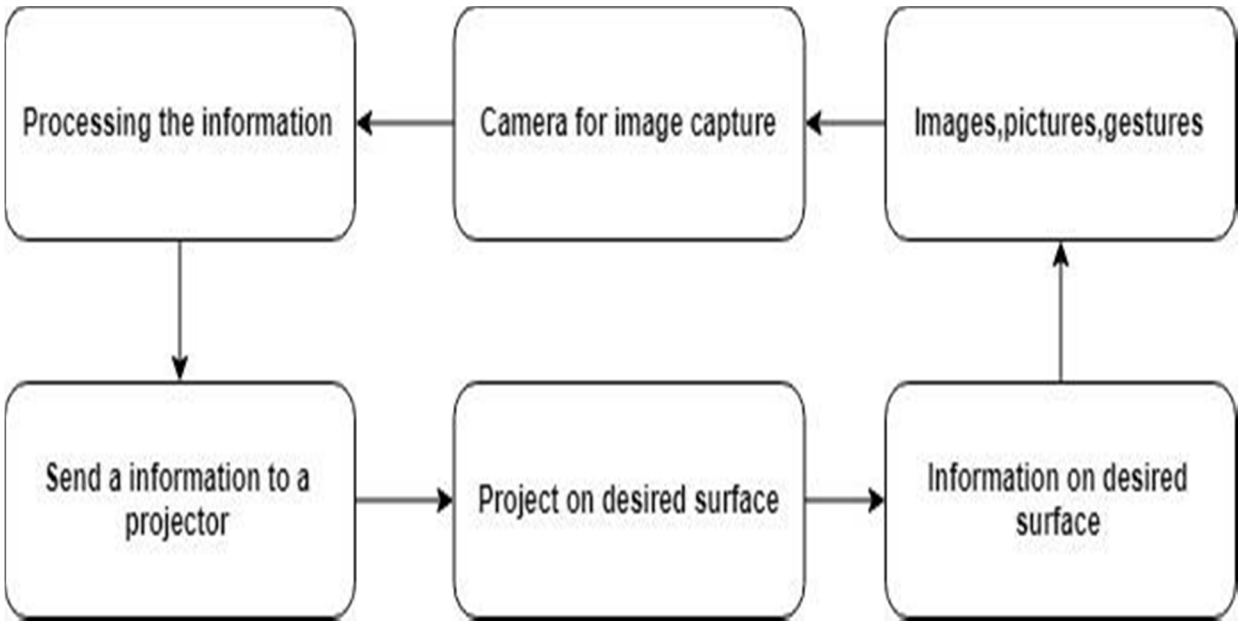


Fig 7.1 Block Diagram

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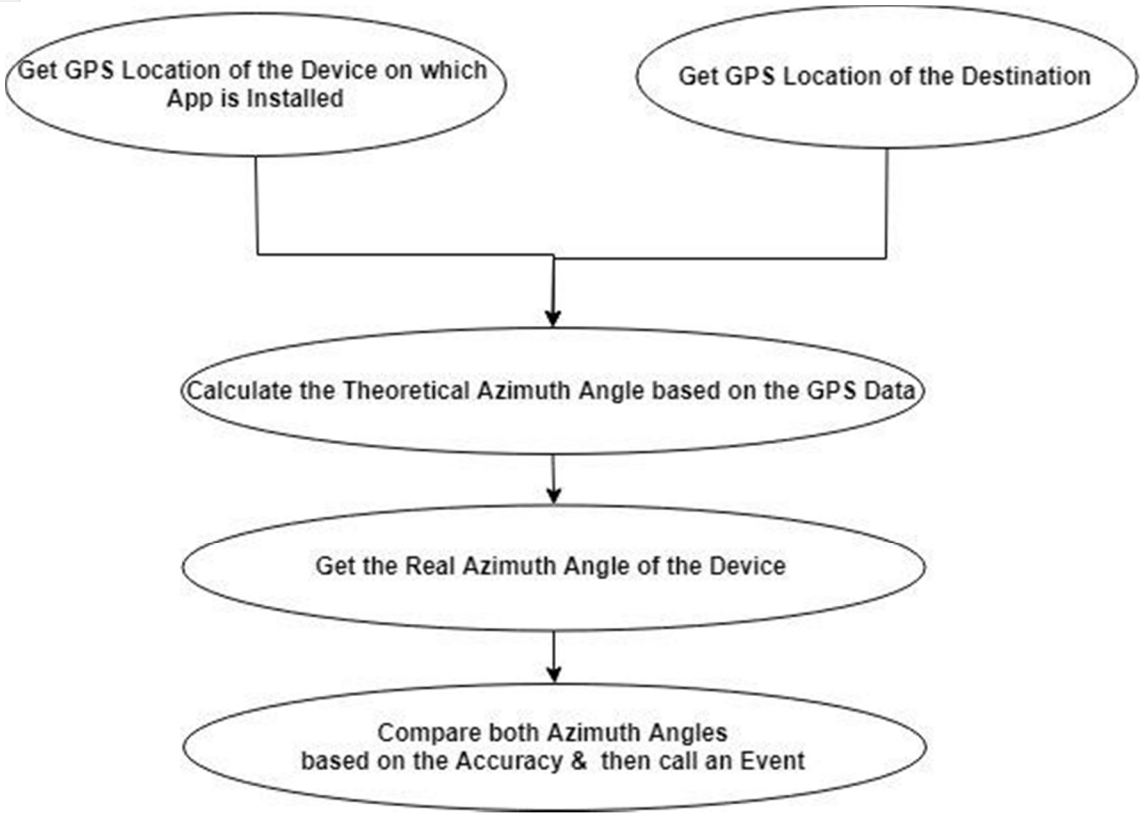


Fig 7.2 Flow Chart

First camera is used to analyze the surroundings nearby, which is then converted and a scene is created. Object's placement is calculated based on the Azimuth Angle from GPS Data and then this data is sent to projector (to camera back in our case) and shows the 3D object placed virtually in real surrounding.

VIII. IMPLEMENTATION, TESTING, DEBUGGING

1) *Implementation:* There were 2 stages in the implementation of project:

a) Assets Modelling

b) AR Based App Development

In the previous semester, we modelled different 3D objects like Ice cream, Cup, Chips Packet using Blender. Blender is a 3D Computer Graphics Software Tools used to create 3D Models. Visual Effects, Motion Graphics can also be added to the Scenes in Blender. These 3D objects were exported to .obj files for further use. For Implementing the project, we used React Native for basic App Development. React Native is a Cross-Platform Mobile App Development Framework developed by Facebook. Using React Native, we were able to develop an app for both android and iOS simultaneously. It is also Open Source and hence gives us freedom to modify the components according to our needs. Yarn and npm was used as package managers & installer for all of the supporting libraries in the app. Viro Media's ViroReact Library was used on the top of React Native to provide hybrid Augmented Reality support. Using ViroReact, ARCore and ARKit libraries need not be handled separately. ViroReact provides wrapper on top of these two basic AR based libraries for native development.

2) *Testing:* Testing of AR Application was done on the Testbed of ViroMedia's App. TestBed is a Simulation App developed by Viro for live testing of the application. It supports 2 functionalities 1. Augmented Reality 2. Virtual Reality. Expo Toolkit was added for homeport of the Project. Expo has features like Hot Reloading, Live Reloading which provides a lot of ease and convenience while development.

3) *Debugging:* Many errors were encountered during the course of Development. StackOverflow Suggestions were used to overcome the majority of errors. Installation of few libraries like react-native-navigation was unsuccessful with npm package manager. So we installed it through Yarn. Few of the documentation of some libraries was outdated which led to using and trying out different libraries for the same function. Major difficulty while modelling was managing the scene.

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IX. CONCLUSIONS

As our aim is to increase the Attendee Interaction at any Event by making use of Augmented Reality Technology. Thus using blender we have developed 3D objects by our own and using react native we have developed an app and then imported that 3D images in the developed app.

As we used marker based AR we required a QR code or marker and camera to detect the marker and overlay the model in a real time environment. As we work with AR we get to know that Augmented Reality will further blur the difference between what's real and what's computer generated by further improving what we see, hear, feel and smell.

Augmented Reality has probability beyond our creativity and perception. It will have a huge number of applications in almost every field. Registration errors are important and unavoidable in some AR systems. For example, to prevent noticeable registration error, the calculated position of an object in the environment may not be determined precisely enough. With the help of anticipation and placement method, you can try to minimize such visible registration error to position your objects in the desired location. Thus AR allows completing the image with artificial elements, which means it can be used for visualizing the surroundings.

We were able to achieve an accuracy of 90% in proper placement of the objects at a particular place. 1 out of 10 objects were incorrectly placed due to dimensional errors in the system.

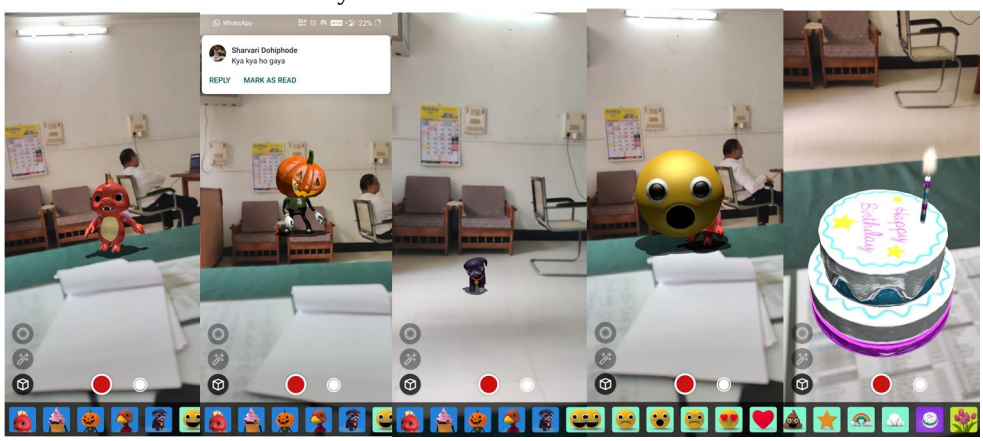


Fig 9.1 Snapshots of Developed Project

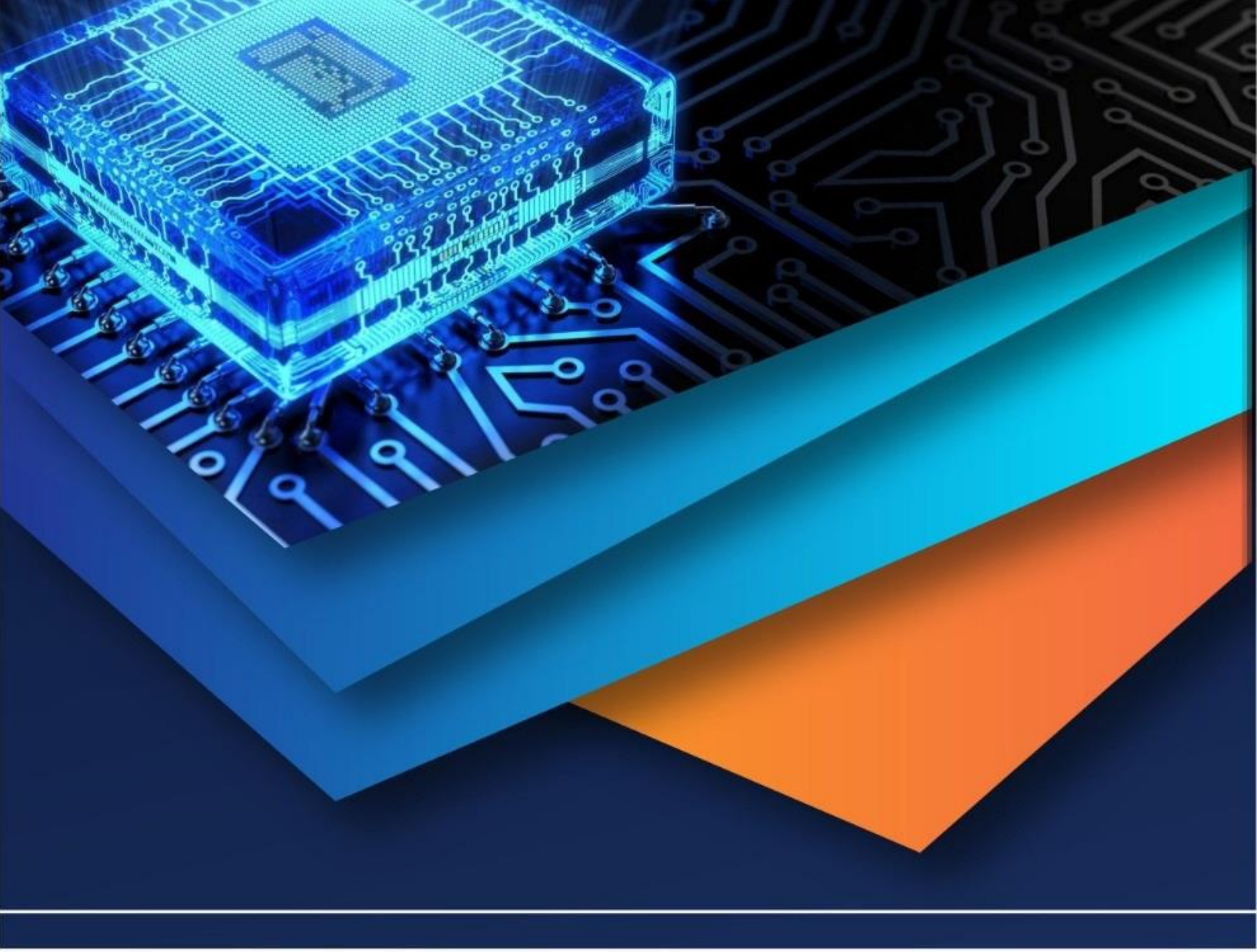
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