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A Review Paper on AR Art Home Decor

Siddhant Patel[1], Harsh Gujarati[2], Maitry Dave[3], Akshat Modi[4], Dr. Bhavesh Patel[5], Mrs. Jahanvi Gupta[6]

[1]Department of Information Technology, Shah and Anchor Kutchhi Engineering College Mumbai, Maharashtra, India
[2]Principal, Shah and Anchor Kutchhi Engineering College
[3]Assistant Professor, Information Technology Department, Shah and Anchor Kutchhi Engineering College

Abstract
The real-time integration of digital information with the user's surroundings is known as augmented reality. Augmented reality makes use of the current world and superimposes fresh information on top of it, in contrast to virtual reality, which creates an entirely fictional environment. AR is a very famous and rapidly growing field. It is used in almost all the fields for better understanding of a concept. With customized instructions, AR applications enable customers to visually test on furniture on their smartphones. Through the overlay of products with real-world settings, augmented reality can increase user retention rates. A custom home is a one-of-a kind house that is designed for a specific user and for a particular location. Custom homes provide the opportunity to control layout, lot size, and accessibility.

Keywords: Augmented reality, retention rate, superimposing products, control layout, accessibility.

1. INTRODUCTION

One of the most fascinating uses of augmented reality technology, which has advanced significantly in recent years, is in home décor. While virtual reality replaces the real environment with a simulated one, it improves one's current experience of reality. When 3D models are integrated with additional technologies, users can experience virtual items placed on top of real-world objects or locations. This is known as augmented reality simulation. Because of this, users of AR home decor apps can have a distinctive and engaging experience that was previously unattainable with conventional interior design techniques.

2. FEATURES

A. Adding furniture:

The user can select various furniture items according to their needs and the 3D model of that furniture item will be placed in front of them. The 3D model will suitably blend in the real-world environment.

B. Creating a 3D virtual room:

We can add furniture in real world surrounding and create a virtual 3d room by just selecting the endpoints of the surrounding room.

C. Favourites:

The selected item can be added to the wishlist. Feel free to include the chosen item in your wishlist,

allowing you to keep track of desired items. This feature enables you to easily manage and revisit your selected preferences.

D. Measurement:

This feature displays the distance measurement between two specified endpoints. Providing valuable information, it helps users quickly assess the spatial span between the chosen locations.

E. Variety of customizable options:

Users have the flexibility to personalize their space by selecting from a range of customizable textures. This feature allows users to experiment with different styles and designs, empowering them to create a unique and personalized space that reflects their personality and taste.

3. PROPOSED METHODOLOGY

a. Unity:

Developed by Unity Technologies, Unity is a cross-platform real-time gaming engine that was initially revealed as an OS-X-only game engine at Apple Inc.'s Worldwide Developers Conference in June 2005. The engine has been expanded to serve 35 platforms as of 2023. For its multiple platforms, the engine can be used to construct simulations and two- and three-dimensional games. Commercially available Unity3D is a multiplatform game engine that may be used to create interactive simulations and visualizations outside of games in addition to 2D and 3D video games. Users can develop 2D and 3D games and interactive experiences using Unity, and the engine provides a primary C# scripting API for both the Unity editor and the games themselves.

b. Scripting in Unity:

Our Game Objects are instructed by scripting on how to behave; the gameplay is created by the scripts and other elements that are tied to the Game Objects and how they interact with one another. Now, pure programming and scripting in Unity are not the same thing. If you've done any pure programming, such as creating an application that runs, you should be aware that Unity handles writing the code necessary to execute the application, saving you the trouble. Rather, you concentrate on the gaming aspect of your scripts. Unity operates on a large loop.

4. BLOCK DIAGRAM

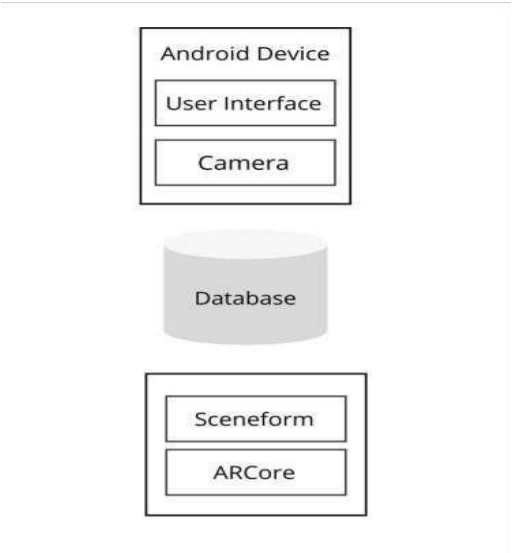

Fig 1.1

5. FLOWCHART

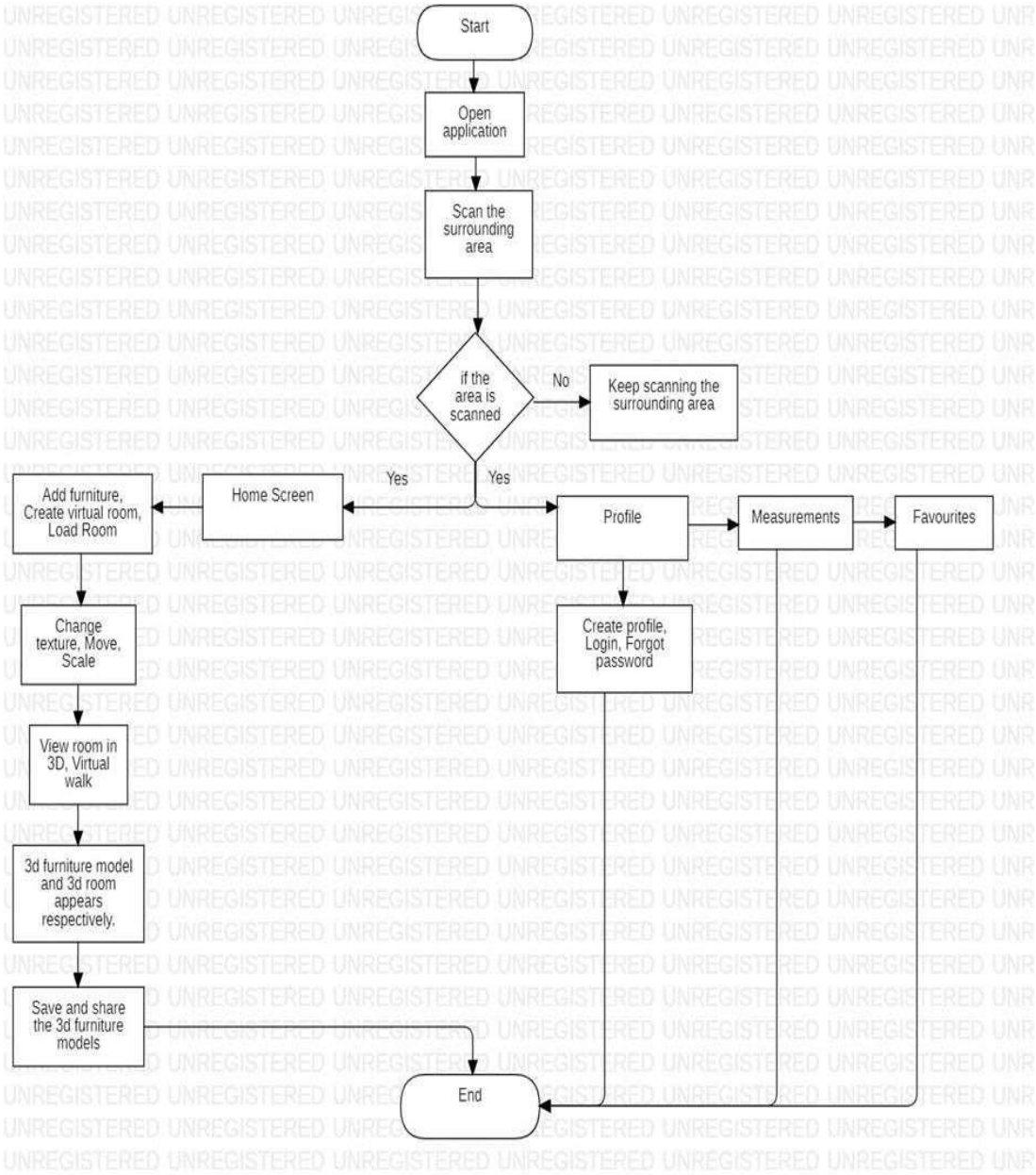

Fig 1.2

6. IMPLEMENTATION

In our augmented reality (AR) project, we've meticulously implemented several key features to enhance user engagement and interaction. Firstly, we've prioritized object recognition and tracking capabilities, enabling our application to discern surfaces like floors and walls within the environment. This functionality seamlessly facilitates the placement of virtual objects onto these surfaces, enhancing the overall realism and immersion of the AR experience. Moving forward, we've integrated a diverse array of 3D models, including furniture and decor items, ensuring they are optimized specifically for AR environments. By incorporating these models, users can personalize their virtual space with ease, whether it's furnishing a virtual room or adding decorative elements. Moreover, our application offers intuitive gestures and interactions to streamline user engagement. Users can employ simple gestures such as tapping to place virtual objects and pinching to zoom in or out, enhancing accessibility and user control.

Additionally, we leverage AR anchors to ensure precise placement of virtual objects within the real-world environment. These anchors serve as reference points, maintaining stability and coherence within the AR experience. Overall, our AR project embodies a comprehensive approach to delivering a captivating and immersive user experience, combining advanced technologies with intuitive design principles to create a platform that empowers users to explore, create, and interact within virtual environments seamlessly.

Fig 1.3

Fig 1.4

7. ADVANTAGES

A. Unique experience:

Our augmented reality (AR) application offers a unique experience by seamlessly blending virtual elements with the real world, providing users with an immersive and innovative way to interact with their environment like never before.

B. Product customization:

With product customization features, users have the freedom to personalize their virtual space by selecting and placing virtual objects, furniture, and decor items according to their individual preferences and style, ensuring a tailored and unique experience for each user.

C. Real world experience:

Our AR application provides users with a real- world experience by leveraging object recognition and tracking capabilities to seamlessly integrate virtual objects into their physical surroundings, allowing them to interact with virtual elements within their immediate environment in a lifelike manner.

D. No additional tools required:

Users can enjoy the full functionality of our AR application without the need for any additional tools or equipment, making it accessible and convenient for anyone with a compatible device, ensuring a hassle-free and seamless user experience from start to finish.

E. Save money:

Our AR application empowers them to save money by minimizing the risk of costly mistakes or purchasing items that may not fit or suit their needs, ultimately leading to more informed and economical buying decisions.

8. LIMITATIONS

A. Data Glitch Possibility:

Data glitches may occur, posing a potential challenge in maintaining the integrity and accuracy of the information presented within the augmented reality environment, necessitating robust error-handling mechanisms and continuous monitoring for seamless user experiences.

B. Proportional Display of 3D Models:

Achieving proportional display of 3D models within the scene can be complex, requiring careful consideration of factors such as perspective, scale, and spatial relationships to ensure that virtual objects accurately integrate with the real-world environment and appear natural to users.

C. Cost Challenges of Scaling 3D Models:

Scaling 3D models across a catalog can incur significant costs in terms of production, optimization, and storage, necessitating strategic planning and resource allocation to ensure scalability and affordability while maintaining high- quality visual assets throughout the AR experience.

9. CONCLUSION

The foundation of our app is the notion of incorporating pre-existing ideas, concepts, algorithms, libraries, and technologies—with just minor adjustments—into a finished, usable application. As a result, we created a new AR experience using AR Core, which adds AR integrations to expand its capabilities, and utilized C# for scripting and the Unity engine for 3D model development. For the user's experience with the system, the 3D-generation furniture offers an appealing and realistic scenario in the actual world. It offers many views and interactive and navigational features. We have so far added a

number of capabilities, including measuring, add, create, load, and favorites.

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