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Augmented Reality based Home Decor App

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Abstract: In this paper, AR based Home Decor App is implemented which uses FAST corner detection. The Proposed System implements Home Decor App for furniture units using concept of Augmented Reality, which changes world of E-commerce by providing best solution to the customers while purchasing online products. The customer buys the product after virtual trial, which is possible through the concept of Augmented Reality. This is just completely new experience to online customers.
Keywords: AR core, Augmented Reality, E-commerce, Fast corner detection, Motion Tracking

I. INTRODUCTION

There are many existing systems that use AR such as clothing, gaming, and navigation which provides an interactive experience in reality. The primary role of augmented reality is that it brings components of the digital world into the existence of the real world. The component does not just appear as a simple display of data, but due to the augmentation, it is perceived as natural parts of an environment. Using this AR technology, an interior décor app is implemented which will help users to have a virtual view of furniture in the real world before purchasing it. Through this application, the user can select a virtual furniture from the options and place it onto the captured space by just dragging the virtual furniture on the real environment. The application will be compatible with all the existing android versions where the mobile camera is an important component. The camera is performing image capturing in a real time environment for a panoramic view. With the use of this application the user will be able to save time and efforts for selecting the furniture by visiting the shop physically. The implementation of the AR technology in the mobile application is done with the help of AR SDK tools. In Augmented Reality (AR), various types of 3D objects are placed in the real world.

II. AUGMENTED REALITY AND APPLICATIONS

Augmented Reality App merges the digital visual content into the user's real-world environment. This allows users to put life-size 3D models in their environment with or without the use of trackers.

Augmented Reality creates better online shopping experiences, Virtual fitting rooms and Personalized Products. Types of AR Applications as Marker-based AR, Markerless AR, Location-based AR, Projection-based AR.Common examples include the holograms.

III. PROPOSED METHOD

The details of proposed method are given below:

A. Design Steps

The below-given steps give the Proposed method of the product:

1) Step 1: Initially, a platform is created to integrate all different entities to accumulate and achieve the objectives described in the presentation. The platform will contain the requisite user interface of the application. The script will be deployed to the basic object which will be later succeeded with the actual object designed using Unity and Sceneform framework which are specially meant to design Augmented Reality Applications

2) Step 2: The script will comprise all divergent functionalities to provide the user with varieties of viewpoints to test with.

3) Step 3: To make things simple for the new user, they are provided with a few presents which will give the abstraction and flow of the Application.

4) Step 4: Algorithms for plane detection and 3d object recognition are implemented to mark the target points.

5) Step 5: All the modules are integrated and developed into the engine. Eg. Sceneform, Android studio.

6) Step 6: A simulation world is made available to the interior design developers. This will allow them to visualize the blueprint of a project in a distinct environment.

7) Step 7: A module is created to select the choice of the scenario. This will also include the option to switch the project course, i.e. AR. The plan and design can be saved and exported to the interior developer's personal device.

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B. System Frame

Augmented Reality App is a software application that merges the digital visual (audio and other types also) content into the user's real-world environment. The system framework is as shown in Figure 1.

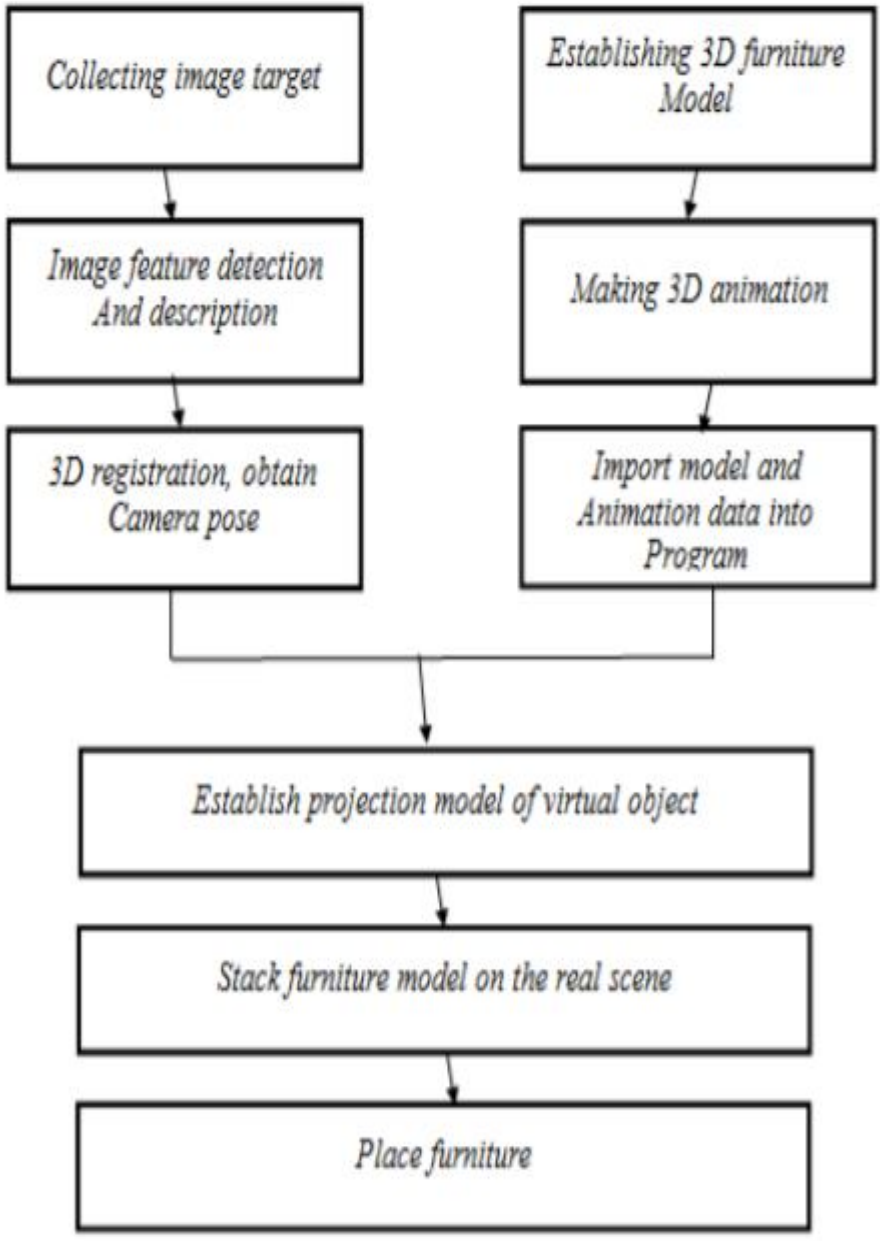


Fig. 1 System Frame Diagram

C. Software Requirements

The app is designed in 2 parts as App Development: Android Studio, JAVA/Kotlin, Figma and AR Development: AR Core, Sceneform. Android Studio software is used to develop android application. Java/Kotlin language will be used to develop the application. Figma Software is used to design, emulate and visualize android applications before the development starts.

ARcore enables Android app developers to quickly and easily build AR experiences into their apps and games.

Sceneform is a plugin used in Android studio to render realistic 3D scenes in AR and MongoDB database used to store user's data and information.

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D. Flow chart for User

Fog. 2 shows flow chart of the system which includes user as buyer who logins or register the system. User can select category of his interest for displaying purpose.

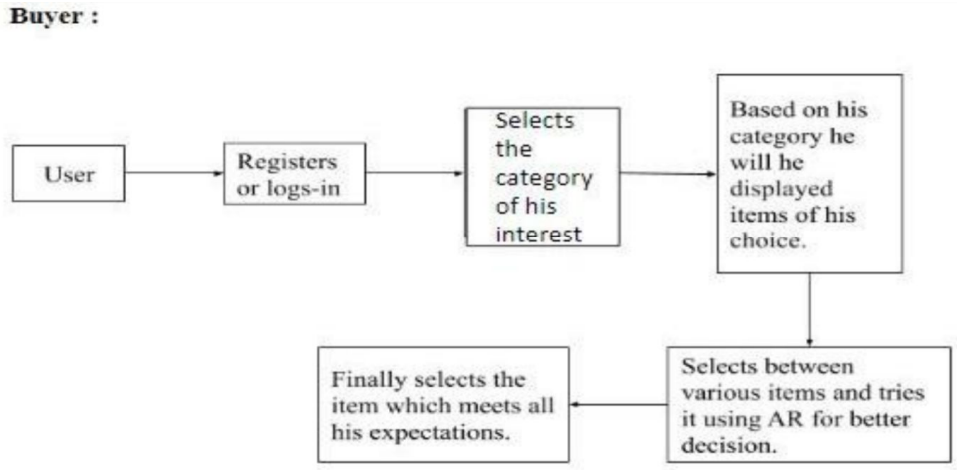


Fig. 2 Flow chart of the system

E. AR core working

In this AR environment, the user is able to adjust the properties of virtual furniture and create its own arrangements in the real world. Through the mobile camera, the user can detect the plan surface and select the furniture through the application and place it on the screen. The details considered are Environmental understanding, Depth understanding, Light estimation and Motion tracking.

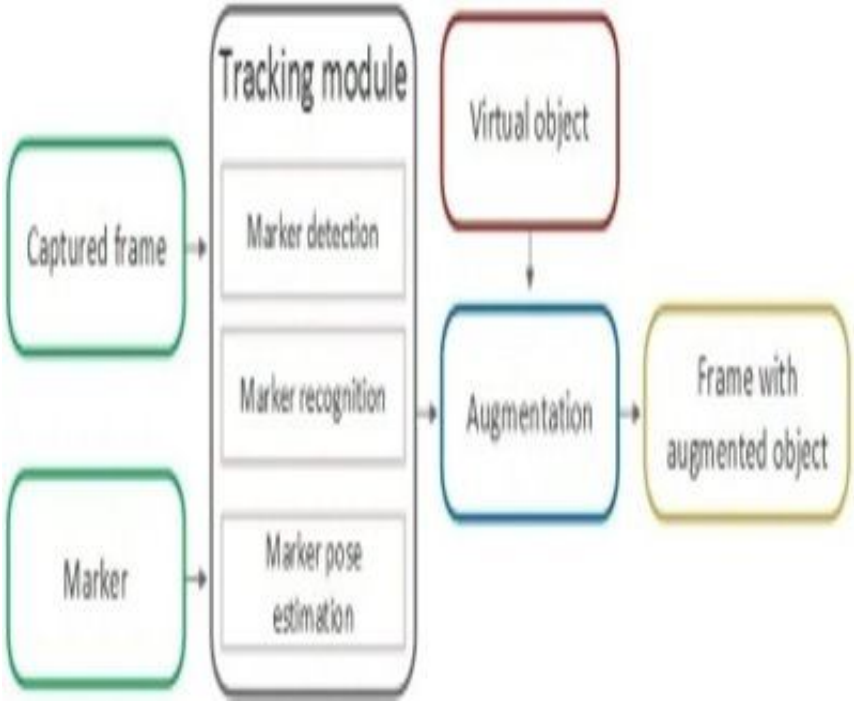


Fig. 3 Working Model of AR core

IV. RESULTS

The following are the snapshots that convey the details of the implemented product. Here, chair is considered as one of the products. 3D view of the chair is displayed on User Home Page as shown in Fig. 4 a). Product Search Page is shown in Fig. 4 b). One of the chair as Green Arm Chair is selected on the Product Page shown in 4 c). On Product Page, “VIEW IN AR” option is provided if the option is clicked, we have AR view shown in Fig. 4 d).

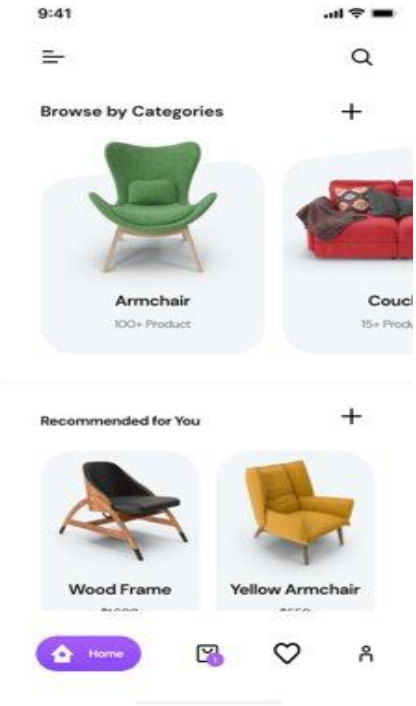


Fig. 4 a) User Home Page

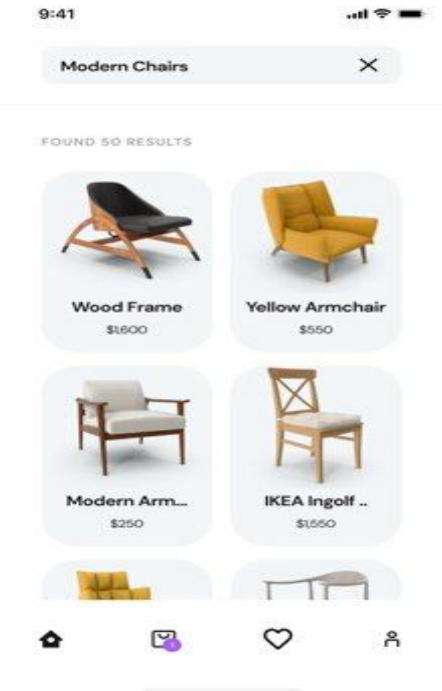


Fig. 4 b) User Search Page

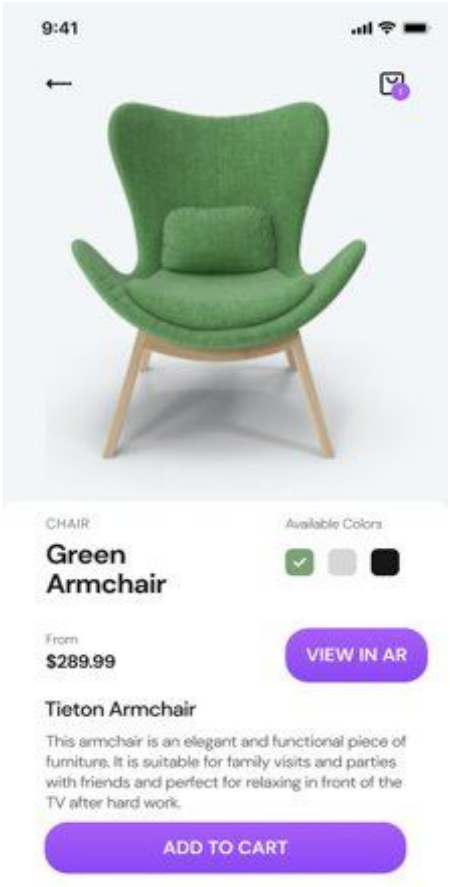


Fig. 4c) Product Page

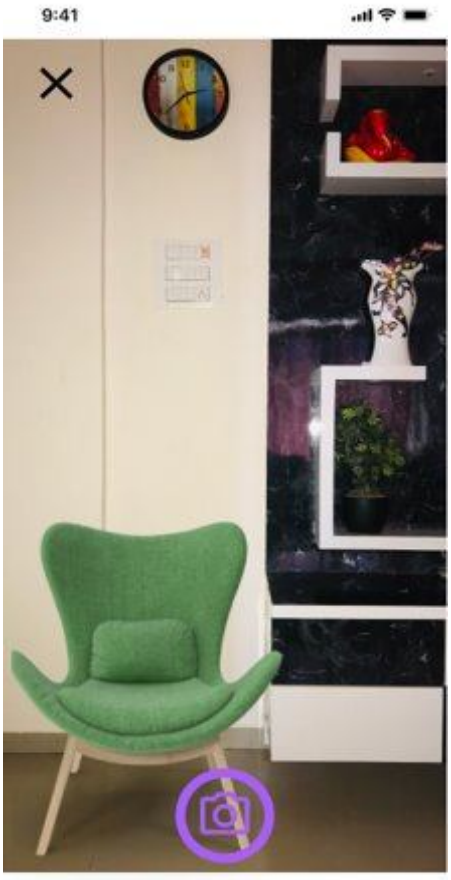


Fig. 4d) AR View Feature

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V. CONCLUSIONS AND FUTURE SCOPE

This system has overcome shortcomings as difficulty in fulfilling the customer's content to design their room without actual image of it, providing all possible views of the furniture or visualizing the furniture space, removed constraint on displaying number of furniture unit in shop. R technology used this paper has changed the way of shopping. The user is able to adjust the properties of virtual furniture and create its own arrangements in the real world. Through the mobile camera the user can detect the plan surface and select the furniture through the application and place it on the screen. Further this mobile application can be integrated with Artificial intelligence to enhance the user's imagination and give an animated experience in real-time environment.

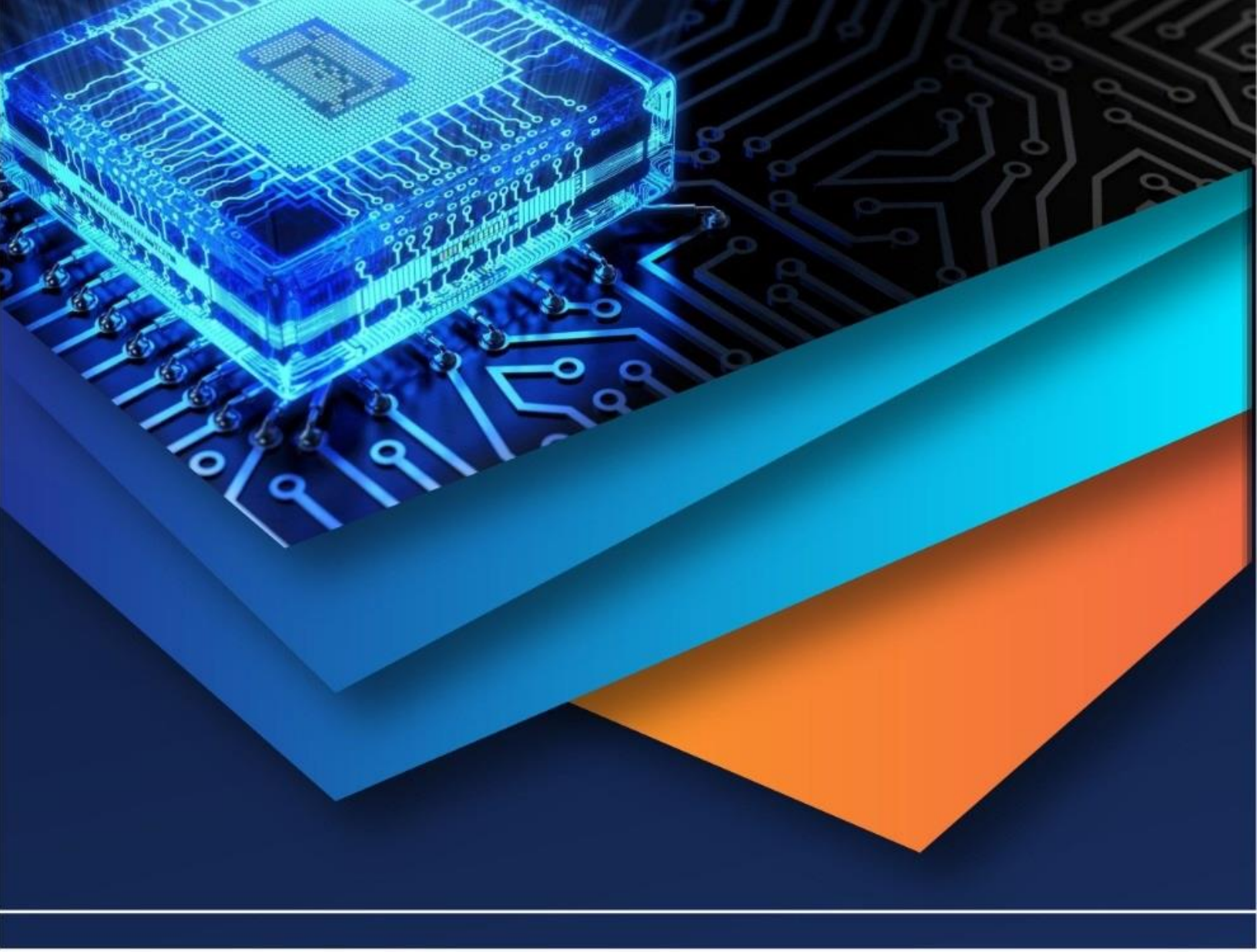
As a design solution, this application helps to cut the prototyping costs and help simulate a better experience for the customer. It also enables the customer to make their home as they want it to be. It also helps the customer to set a theme in the house and get a feel of it before placing an order. This application will also prove beneficial to the companies for advertisement purpose.

In future, system is extended as dataset and scope of the system is scalable and user can plan interior designing.

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