HOME FURNISHING USING AUGMENTED REALITY

KUSH MEHTA 2018B5A70956P

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ABOUT PROJECT DOMAIN

AUGMENTED REALITY

It is a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view.

AR can aid in visualizing furnishing homes, offices and. Computer-generated images/models of a furniture can be superimposed onto a real-life local view of a property before the physical furniture is bought and placed there.

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ABOUT PROJECT

Aim

The aim of the project is to self-furnish and preview your house by selecting a furniture for bedroom, hall and dining hall and placing it at a desired location to give it a finished look before buying it.

Softwares Used

1. Unity: Unity is a cross-platform game engine with a built-in IDE developed by Unity

2. Vuforia: Vuforia is an Augmented reality software development kit (SDK) for mobile devices which enables the creation of augmented reality applications

3. Visual Studio Code: Visual Studio Code is a free source-code editor made by Microsoft for Windows, Linux and macOS.

ARs Created

1. Bedroom
   1.1. Beds(3)
   1.2. Lamps(3)
2. Drawing Room
   2.1. Sofas(3)
   2.2. TV Tables(3)
3. Dining Hall
   3.1. Dining Tables(3)
   3.2. Shelves(3)

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WORKING OF THE APP

Main Scene

This scene opens as soon as the app loads.
It contains three buttons to toggle between the three locations i.e. Bedroom, Drawing room, and Dining hall and a gallery button to view the stored screenshots.
For demonstration, here, the bedroom button was pressed.

Gallery Button

BedRoom Scene

Layout Description

1. The scrollview contains the 3D models as buttons which can be pressed to select the model. They can also be rotated.
2. The back button would lead us back to the main scene.
3. The application uses ground plane detection feature and hence has to be faced towards the floor to augment the model.

Object Augmented

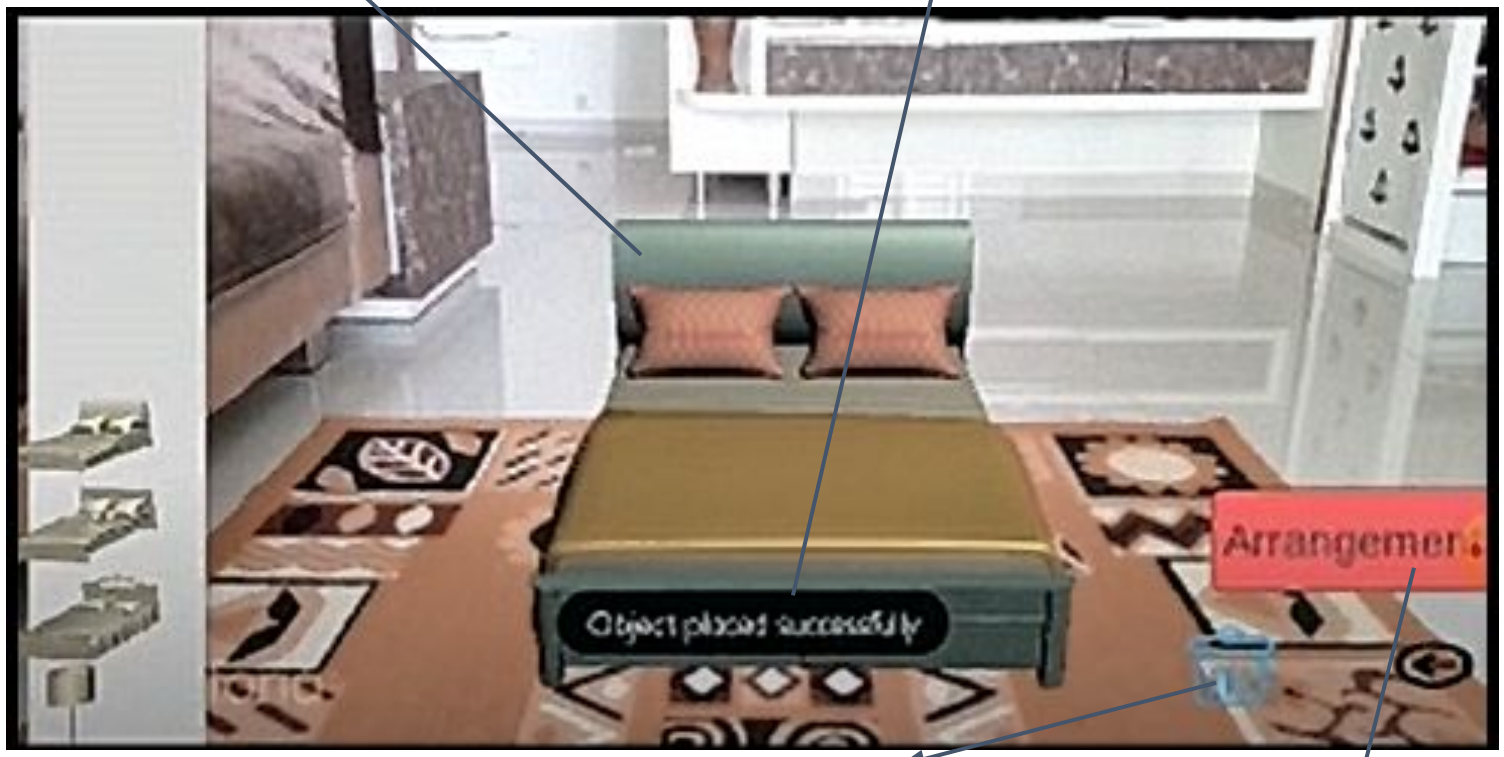
On pointing the camera towards the ground, the object selected from the scrollview gets augmented.
A button named ”Place” is shown at the bottom.

The “Place” Button

1. The place button is used to fix the object at the position and thereby ceasing all the movement of the object.
2. The object lands on the ground when the button is pressed so that it does not appear as if it is floating.
3. Thereafter, more objects can be placed relative to that object.

Place Button Pressed

Two new buttons named “arrangement” and delete icon appears.
A message is displayed to let the user know the status of the operation.



The “Arrangement” and Delete icon Button

1. Arrangement Button

   It shows all the object which have been placed.

   It disables all the other UI components to have a clearer view of the arrangement.

2. Delete Icon

   To delete an object after placing it the delete button is pressed.

   Thereafter, the object which is to be deleted is tapped upon.

Generating the Second Object And Collision Detection

Once the first object is placed we can add another object and do similar operations with it.
Since one object has already been “placed” therefore the “arrangement” and delete icon appear.

Collision Management

1. The user is not allowed to place two objects at a single location or when the objects are overlapping
2. Therefore, the place button disappears and hence denies the user the ability to place it.
3. A message showing “Objects are Colliding” appears on the screen showing the user about the action.
4. Upon clicking the arrangement button only the object which has been placed will be visible.

Removal of Collision Error

Once the object has been shifted to a different location where different objects are not colliding the user can safely place the object and perform regular operations.
A message showing “Functions restored to normal” is also displayed.

Arrangement Layout

The arrangement button shows all the objects which have been placed.
To enhance visibility all unnecessary UI elements like the scrollview, the arrangement button, the place button and the main text have been removed.
A camera icon appears to take the screenshot of the arrangement and store it.

Camera Icon

1. The camera icon is a button used to take a screenshot of the arrangement to view it in future.
2. When the camera button is pressed the delete icon and the back button disappear for a moment so that they don’t appear in the screenshot and then reappear again after the screenshot is taken.
3. Moreover, this momentary disappearance and appearance of the buttons create a blink on the screen to make the user aware that the screenshot has been taken. Also a message showing “Screenshot taken” appears.
4. The screenshot is stored in the path File manager -> Android -> Data -> Application name -> Files.

Gallery Scene

Upon clicking the Gallery icon in the main scene, this layout opens showing the stored screenshots in order. The two arrows on the top are for toggling between the next and the previous screenshots.

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MAJOR LEARNINGS

Major Learning

1. Got a good idea about the technologies and techniques used to create AR applications.
2. Learnt how to use the Unity framework along with the Vuforia SDK.
3. Learnt how to code in C# and implement it in an application.
4. Got to know what it is like to work for an Industry and incorporate the suggestions of the mentor/authorities.
5. Learnt how to create an application from scratch through planning and visualisation.
6. Learnt how to write a project report and a Software Requirement Specification.

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CONCLUSIONS

Conclusions

1. An AR application was created successfully to preview furniture arrangements in our home.
2. The application was created for the furniture stores to add their furniture and create a store-specific app to be given to their customers.
3. The user can preview different sets of arrangements and store the screenshot in a location.
4. The saved arrangement can be viewed later to buy or for reference.
5. The project can be further modified to decorate office areas, party plots, etc.
6. The interior decorators can use the application to build upon the preexisting data.

Thank You