

ARchiviewer: AR application to visualize floor plans in 3D

Team 9 AR Project Documentation

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1. Introduction

ARchiviewer is an AR application that visualizes architectural floor plan as 3D model. The users can change the material of the model, placing furniture, and change the time of day to see the sunlight. GitHub repository: <https://github.com/imp-team-9/archiviewer>

2. Playing instructions

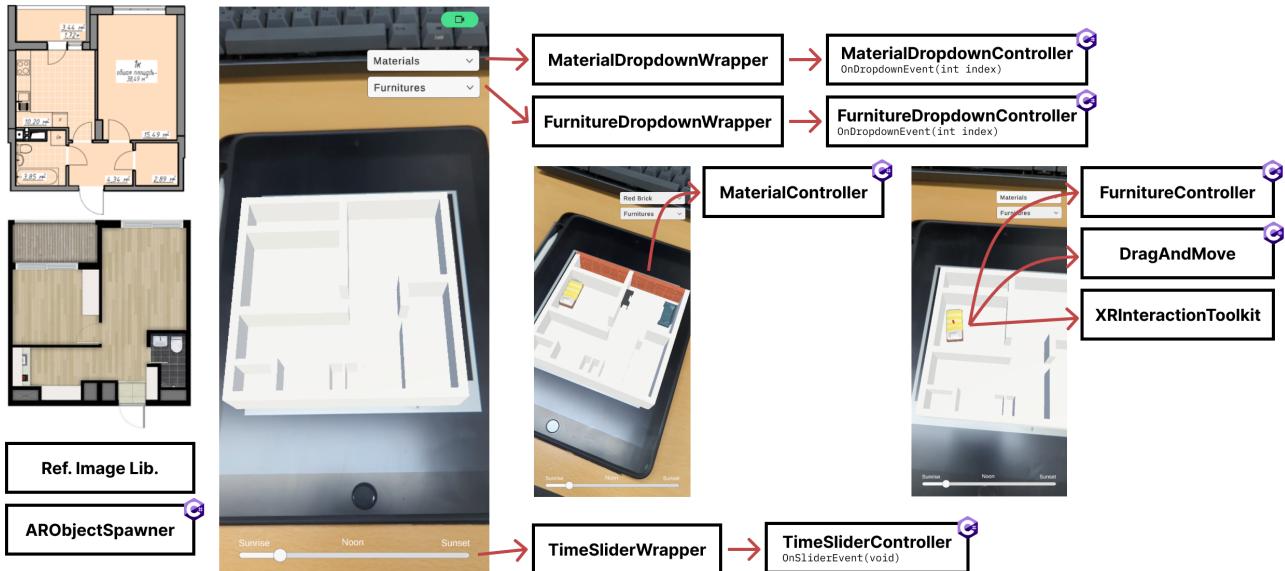


1. The goal of this app is to show 2D floor plans in 3D, so you will need floor plan images. Please print out or display on screen the FloorA.jpg or FloorB.jpg file in the Assets/ReflImageLib directory of the project.
2. Next, launch the app and point the camera at the image. Once the 3D model of the floor plan appears, you can freely explore different sides of the building and the interiors of the rooms.
3. There are two dropdown menus in the top right corner of the screen. Through the "Materials" menu, you can change the texture or color of the model. Select the material you want and then touch the part of the model to change it's material.
4. Through the "Furnitures" menu, you can place furnitures in the 3D model. Select the furniture item and then touch the location where you want to place it. After placing furniture, you can drag to move it, use two fingers to resize it, and rotate it.
5. Finally, by moving the slider handle at the bottom of the screen, you can adjust the position of the sun from sunrise to noon to sunset.

3. Flowchart of the screens



4. Architectures



We created a 'Wrapper' object to control the UI. We wrote a script that contains a callback function that is called when the value of the Input UI changes and registered it to the 'Wrapper' object.

When the user selects an item from the dropdown menu, the controller's callback function handles the logic. For example, selecting a material from a dropdown menu makes the MaterialDropdownController to change the currently selected material in the MaterialController. If the user taps the game object of the model, the MaterialController changes the material of the tapped object to the currently selected material using raycast.

The selection, rotation, and resizing of the furniture objects was implemented using the XR Interaction Toolkit. Moving the furniture was implemented by writing a separate script.

5. References

- Unity Documentation: User Manual, <https://docs.unity3d.com/Manual/index.html>.
- Sound effects: Pixabay, <https://pixabay.com/sound-effects/search/sfx/>.