

CSC1097

FINAL YEAR PROJECT

ARrangeIt

User Manual

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Abstract

ARrangeIt is an Android based Augmented Reality (AR) mobile application designed to assist users in visualising furniture and decor items within their physical spaces before purchasing. By integrating ARCore and Firebase technologies, ARrangeIt enhances the online shopping experience by overlaying 3D models of furniture into real-world environments using the smartphone cameras. The application addresses major usability gaps in current AR shopping tools, focusing on Android compatibility, multi-item placement, real-time measuring ability and saving configurations.

Installation Guide

System Requirements

- Android device running Android 15.0 or later
- Android device with ARCore support → check [here](#) for further details
- Minimum 100MB of free storage space
- Internet connection
- USB Cable
- Android Studio (latest)
- Java SDK 11+

Installation Steps via Cloning the Repo (Code Method)

1. Open Android Studio and run the following command to clone the repository from ARrangeIt repository on Gitlab

```
git clone https://gitlab.computing.dcu.ie/hudsonj5/2025-csc1097-hudsonj5-santhos-2.git
```

2. Once the repository is cloned and opened in Android Studio, make sure the following Packages are installed.

SDK Platform

Android 15.0 (“VanillaCream”)

Android SDK Platform 35

Sources for Android 35

Google APIs Intel x86_64 Atom System Image

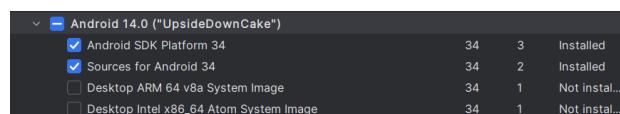
Google Play Intel x86_64 Atom System Image



Android 14.0 (“UpsideDownCake”)

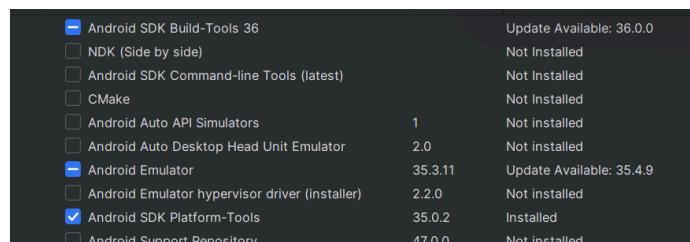
Android SDK Platform 34

Sources for Android 34

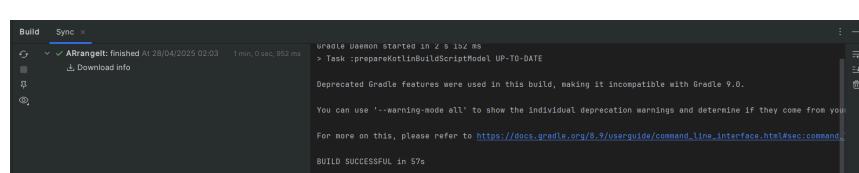


SDK Tools

1. Android SDK Build-Tools 36
2. Android Emulator
3. Android SDK Platform-Tools



3. Sync Gradle and resolve dependencies using the “Sync Project with Gradle files” button.



4. Deploy APK to the Android device using the “**Run app**” button. Ensure your device is connected to the device via USB cable.



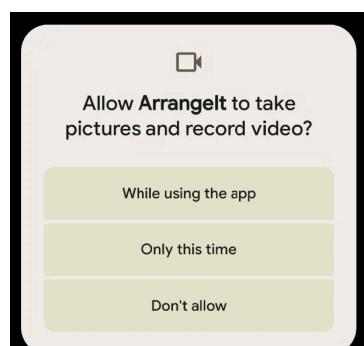
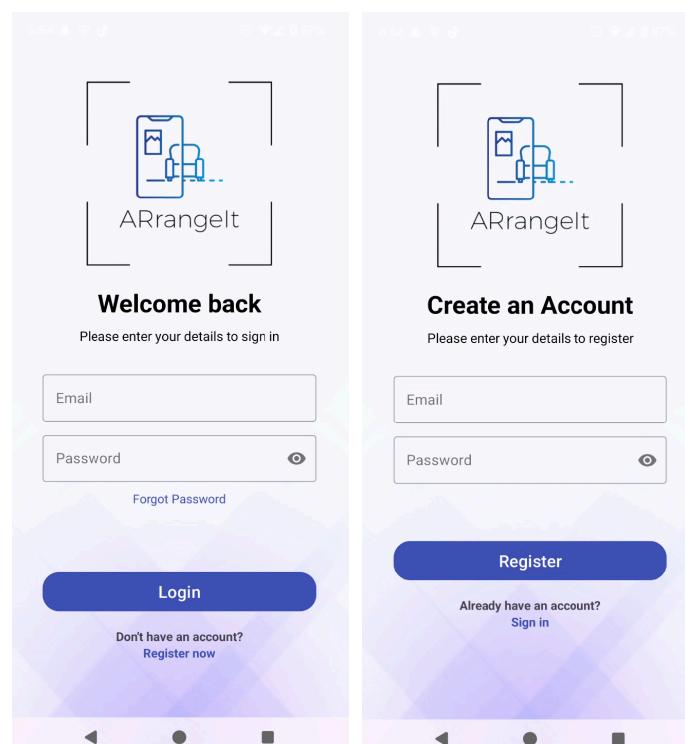
Installation Steps via APK file (Download Method)

1. On your device, download the ARrangeIt APK from the repository [here](#) by clicking the download icon on this file.
2. Go to the device's system settings and enable “Install unknown apps” in Settings > Apps & notifications > Special app access. Allow Chrome and File Manager to have access enabled.
3. Navigate to your file manager and locate the downloaded APK file. It should be listed under the name ARrangeIt.apk
4. Tap the APK file to begin the installation.
5. Follow the on-screen instructions and navigate to the downloaded ARrangeIt application after

Getting Started

First-Time Setup

1. Upon first launch, you will see the welcome screen
2. Here you will be prompted to log in to your existing account using email and password credentials. If you forgot your password, click the “Forgot Password” button and follow the on-screen instructions to reset the password using your registered email address.
3. If you do not have an existing account already, you may navigate to the sign up screen using the bottom “Register Now” button and fill in the email and password fields. Ensure your email is a valid email and your password consists of a minimum of eight characters, at least one uppercase and one lowercase letter, a digit and a special character.
4. You will then be redirected to the login screen again where you can enter these details into the email and password fields to log in successfully.
5. After logging in, you will be prompted to accept camera permissions. Clicking “While using the app” or “Only this time” will allow you access to the applications features.



Application Features

AR Furniture Placement, Movement and Deletion

Place virtual furniture models in your real-world environment using augmented reality to visualise how items would look in your space.

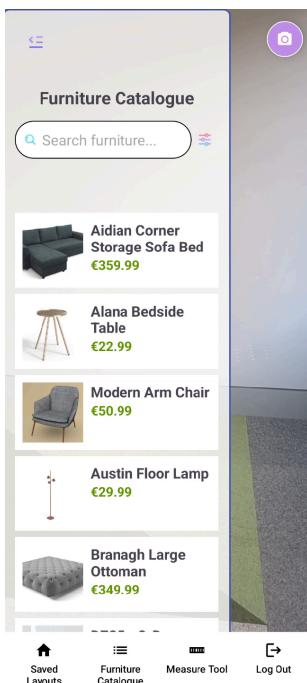
Step-by-step instructions:

1. **Accessing the Furniture Catalogue:** Tap the "Furniture Catalogue" button in the navigation bar

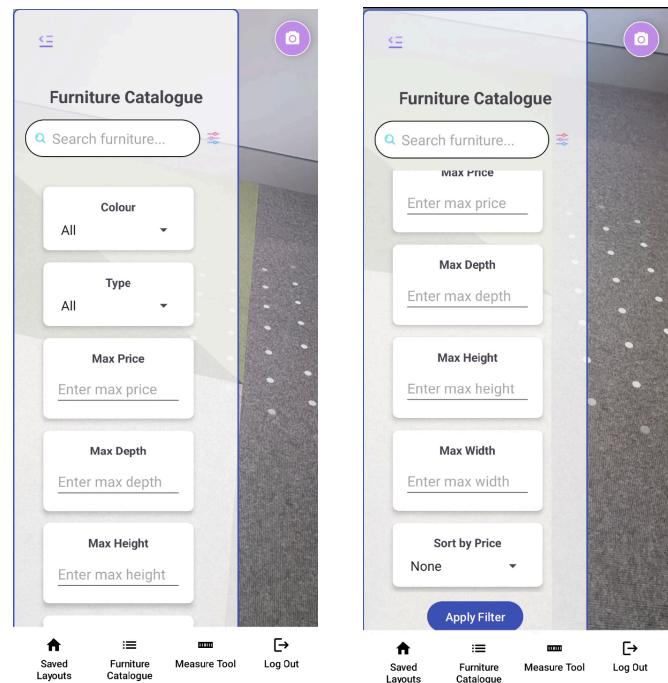


2. **Browsing & Filtering Furniture Models:** Browse through the available furniture models. Use the filter options (color, type, dimensions, price) to refine your search. You can also use the search bar to look for particular items

Catalogue View



Filter Options

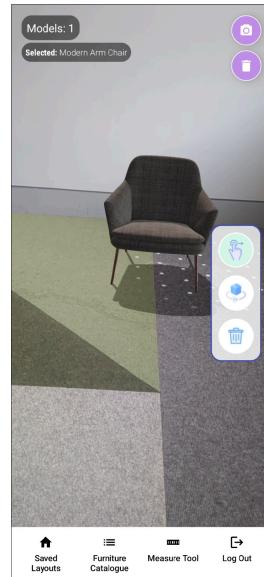


3. **Selecting a Furniture Item:** Select a Furniture item to view its details. The expanded view will provide further detail on the item such as:

- Image Reference
- Price
- Description
- Dimensions (Height, Width, Depth)
- Available Colours
- Textures

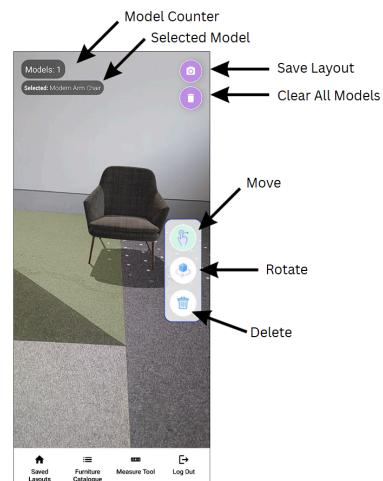


4. **Placing the Furniture in AR:** Tap the "Place in AR" button to load up the 3D model and return to camera view. Move your device slowly to allow for plane detection (available surfaces will highlight). Tap on the detected surface to place the furniture model.



5. **Adjusting the Furniture Placement:** Use the on-screen controls to refine the position

- Move: Allows the user to change the position of the model by dragging to reposition.
- Rotate: Allows the user to adjust orientation by spinning the model.
- Delete: Allows the user to remove the model from the environment.
- Model Counter: A counter keeping track of how many models are in the environment.
- Selected Model: A tag that keeps track of what model is currently selected and using the controls.
- Saved Layouts: Allows the user to save the current layout for later review.
- Clear All Models: Allows the user to delete all placed models from the environment.



6. **Creating Multi-Item Arrangements:** Repeat the process to add more furniture pieces. Arrange them to visualise a complete room setup.

Expected outcomes:

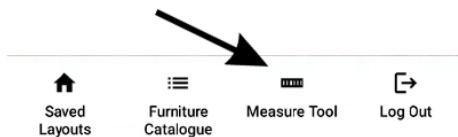
- Accurate AR rendering of furniture in your physical space
- Ability to create multi-item arrangements
- Visual confirmation of placement with interactive controls and environment information (model selector and model counter).

Space Measurement Tool

Measure distances between points in your environment to ensure furniture will fit in your space.

Step-by-step instructions:

1. **Measure Icon:** Tap the "Measure Tool" in the navigation bar.



2. **Using the Tool:** Point your camera at the area you want to measure.

- Tap the starting point on your screen to set the first point.
- Tap the ending point on your screen to set the second point.
- View the calculated distance (in centimeters) displayed between points.
- You can click clear measurement to clear the measurements.



Expected outcomes:

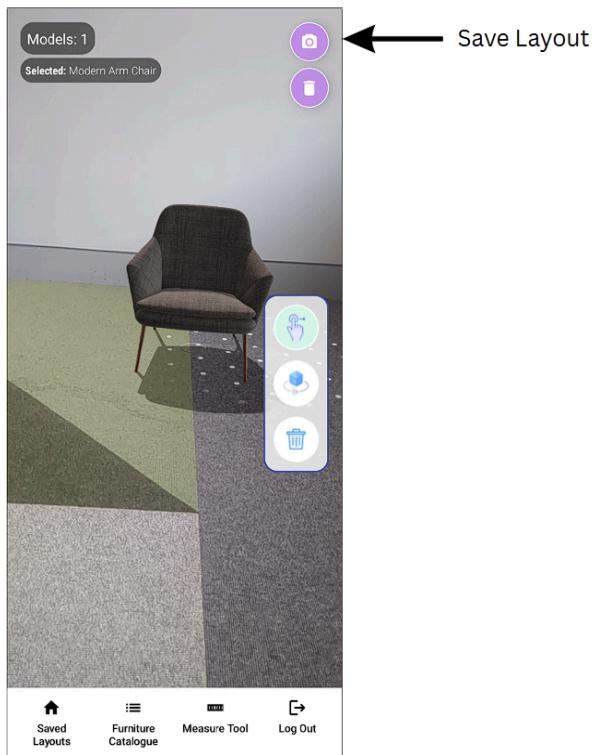
- Accurate distance measurements between any two points
- Visual line connecting measured points with measurement label
- Ability to take multiple measurements sequentially after using the clear measurements button.

Layout Saving & Management

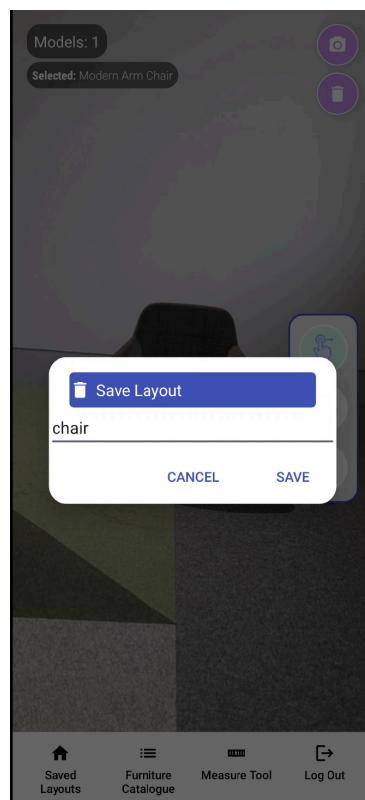
Save and manage your AR furniture arrangements as snapshots for future reference.

Step-by-step instructions:

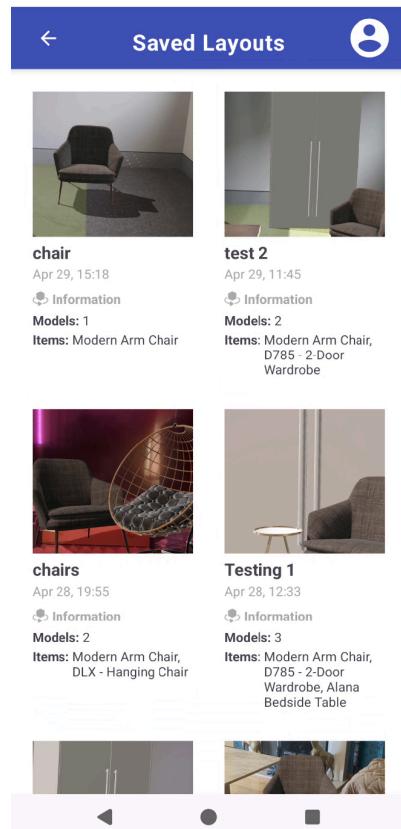
1. **Save Layouts Icon:** After placing furniture models, tap the camera button



2. **Name Layout:** Enter a name for your layout when prompted. Tap "Save" to store the arrangement

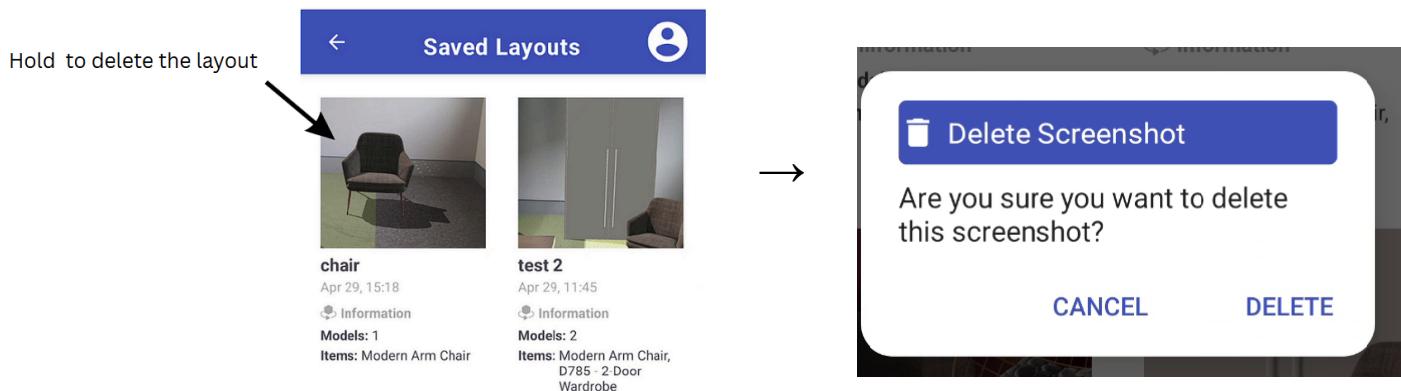


3. See your Layout: View saved layouts by tapping "Saved Layouts" in the navigation bar



For management:

4. Tap any layout to view it fullscreen. To navigate backwards use an upwards swipe or the back icon.
5. Press and hold a layout to delete it. Confirm by pressing Delete when prompted.



Expected outcomes:

- Saved snapshots of your AR arrangements
- Organised grid showing layout names, creation times, model counts and models used in the layout
- Ability to review or delete previous layouts
- User Profile access

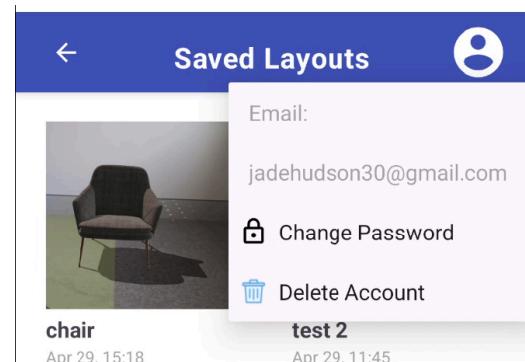
User Profile

Manage your user account activities

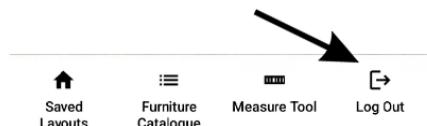
1. **Login:** First ensure the secure login/registration system has been completed to access the application.
2. **User Profile Icon:** After navigating to the saved layouts interface, a user profile icon can be observed at the top of the page



3. **Profile Options:** After clicking the profile icon you are presented with:
 - Your registered email
 - Change password option
 - Delete account



4. **Session management with logout capability:** If you would like to log out, navigate back to the AR session using the back arrow and click the logout icon



Additional Features

Furniture Catalogue

- Filter by: Colour, Furniture Type, Dimensions (height/width/depth), Price Range
- Sort by: Price (low-high or high-low)
- Search Bar
- Detailed product views with specifications and images

Model Management in AR View

- Top display shows the currently selected model name
- Counter shows total placed models in the scene
- "Clear All" button with confirmation dialogue to reset the scene

Application Navigation

Login and Register User Interface Navigation

Login Screen

- Email Field: Enter your registered email.
- Password Field: Enter your password.
- Login Button: Tap to log in.
- Forgot Password?: Tap to reset your password via email.
- Register Button: Tap if you don't have an account yet.

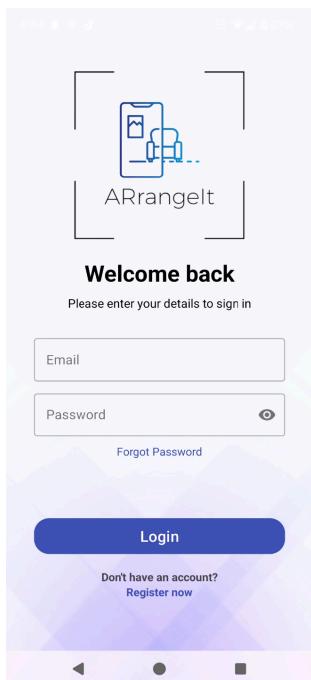
Register Screen

- Name, Email, Password Fields: Fill in your details.
- Register Button: Creates your account and logs you in.
- Back Button: Returns to the login screen.

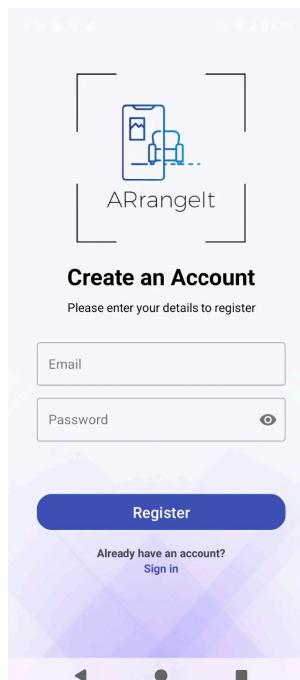
Forgot Password Dialogue Box

- Email Field: Enter your registered email.
- Reset Password Button: Sends a password reset link.
- Back Button: Returns to login.

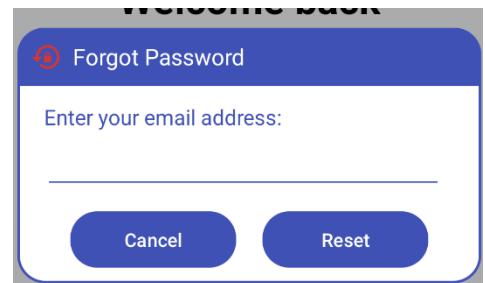
Login Interface



Register Interface



Forgot Password Interface



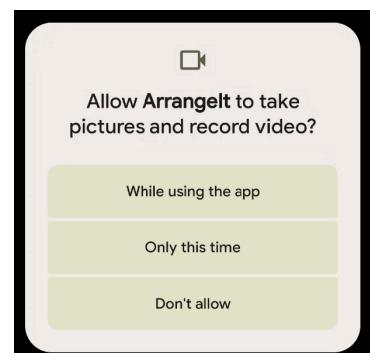
AR Camera User Interface Navigation

Permissions Prompt

The app will request camera access and give you three options

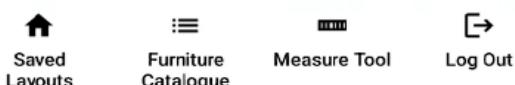
- While using the app
- Only this time
- Don't allow

To proceed to the application, click either of the Allow options
(While using the app, Only this time)



Bottom Navigation Bar

The bottom navigation bar will be the main focus point of the applications functionality. It gives the user 4 navigational paths:



Icon	Function	Description
Saved Layouts	View previously saved AR room setups and user account information.	Displays all of your snapshots with information such as layout title, timestamp, models used and model counts.
Furniture Catalogue	Browse & filter furniture models.	Filter by type, dimensions (height, width, depth), colour, and price.
Measure Tool	Measure distances in your space.	Tap two points to get dimensions between in cm.
Log Out	Sign out of your account.	Returns to the login screen.

AR Scene Controls

Screenshot Button (Only active after placing furniture)

- Tap to save your AR setup.
- Enter a name for the layout before saving.



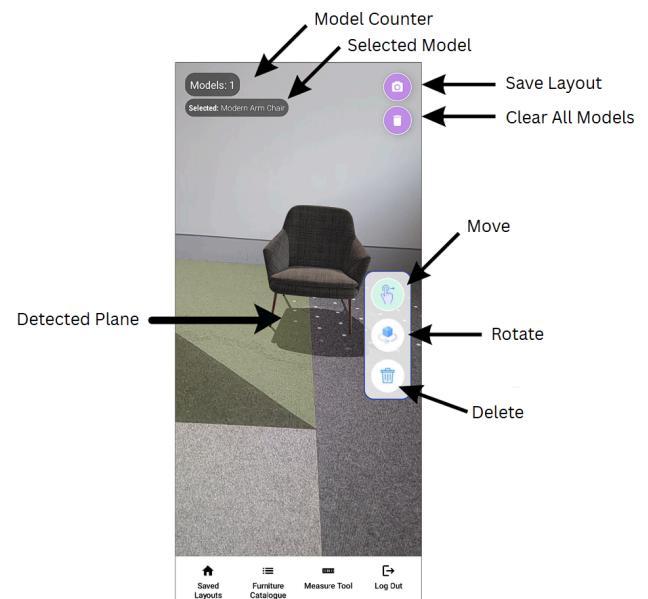
Clear All Button

- Removes all placed models from the scene.
- Confirmation dialogue appears ("Are you sure?").



Placing & Editing Furniture

1. After selecting a model from the Catalogue, return to the camera view.
2. Tap on detected surfaces (highlighted) to place the model.
 - o Move (drag the model)
 - o Rotate (adjust orientation)
 - o Delete (remove the model)
3. The top bar shows:
 - o Current selected model name
 - o Total models placed (counter)
 - o Save Layouts
 - o Clear All Models



Furniture Catalogue User Interface Navigation

Browsing & Filtering

Filter Options:

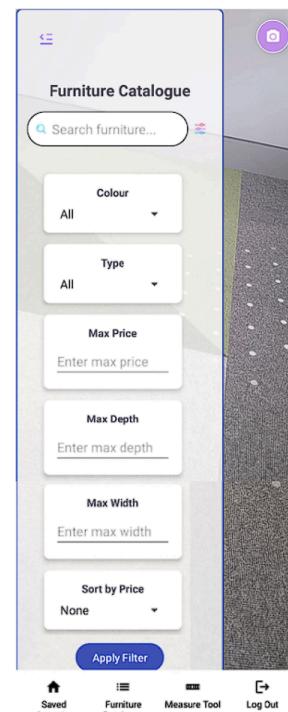
- Category/ Type (Sofa, Table, Bed, Desk etc)
- Colour
- Dimensions (Height, Width, Depth)
- Price Range

Sorting:

- Price: Low → High / High → Low

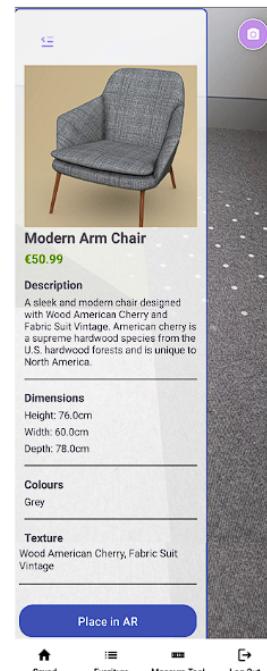
Search:

- Enter a query into the search bar to find furniture items containing the words of that query



Selecting & Placing a Model

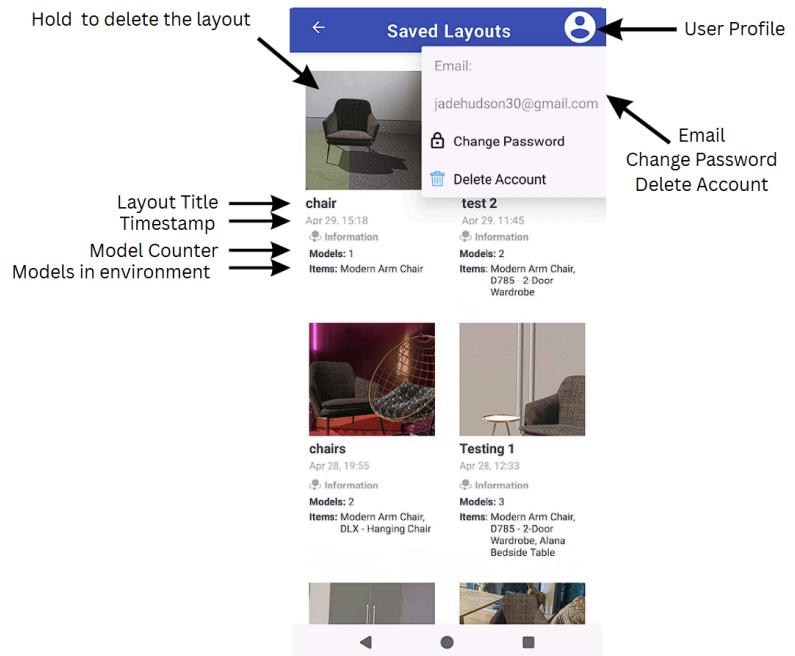
1. Tap a furniture item to see details (image, dimensions, price, Description, colour).
2. Tap "Place in AR" button: returns to camera view for placement.
3. Back Button (top left): Returns to the catalogue.



Saved Layouts User Interface Navigation

Viewing Saved Setups

- Displays a grid listing of previous AR snapshots
- Each entry shows details of the layout including:
 - Layout name
 - Date/time saved
 - Number of models in the scene
 - List of furniture models used



Interacting with Saved Layouts

- Tap a layout: Opens the layout image in fullscreen.
- Press & hold a layout: Delete option with confirmation.
- Back Button (←): Returns to AR camera view.

User Profile Engagement

- Email: The logged in users email.
- Change Password: Sends a password reset email to the user.
- Delete Account: Allows the user to delete their account.

Troubleshooting and Frequently Asked Questions

- Q: Google Play store out of date for ARCore? Refer [here](#) to download the updated apk version (currently Google_Play_Services_for_AR_1.48.0.apk).
- Q: AR not detecting surfaces? Ensure good lighting and move your device slowly.
- Q: Furniture model not loading? Check your internet connection.
- Q: Controls not responding? Restart the AR session —> Logout and log back in.
- Q: Can I resize furniture? Currently not supported as dimensions are accurate to the real model size.