

RKSLAM Android Demo 1.0

USER MANUAL

**VISION GROUP, STATE KEY LAB OF CAD&CG,
ZHEJIANG UNIVERSITY
[HTTP://WWW.ZJUCVG.NET](http://www.zjucvg.net)**

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1 Introduction

1.1 Product Specification

RKSLAM Android Demo: RKSLAM Android Demo is an augmented reality application on Android platform, using the SLAM technique described in the paper: Haomin Liu, Guofeng Zhang, Hujun Bao. **Robust Keyframe-based Monocular SLAM for Augmented Reality**. International Symposium on Mixed and Augmented Reality (ISMAR), 2016. The application operates at above 30fps in a modern Android Device. Please visit our project website <http://www.zjucvg.net/rkslam/rkslam.html> for more details.

1.2 Feature Functionalities

- **Initializing SLAM with different markers:** The tracking system can be initialized with either an A4 size paper or a letter size paper.
- **Inserting virtual objects into the scene:** Once the system is initialized, you can insert virtual objects into the scene.
- **Moving, rotating, resizing, deleting virtual objects in the real captured scene:** For the virtual objects you have placed in the scene, you can move, rotate, resize or delete them with simple finger operations.

1.3 Feature Functionalities

1.3.1 Real-time Tracking

Our application supports to track a freely moving camera on various Android devices. The whole process is done in real-time and generates robust 6DOF camera tracking result.

1.3.2 Support for Camera Tracking Under Various Android Devices

RKSLAM Demo can efficiently and robustly operate on existing Android devices with SDK version **above 5.1.1**. The application automatically reads camera parameters from devices, without the need to provide any previously calibrated camera parameter file.

1.3.3 Recommended System Requirements

- Android **5.1.1** or above (recommend Android 6.0). Android 5.0 still has a problem for running this App.
- 2G memory or above
- Quad core CPU.
- 50M of internal storage space.

2 A Simple Example

2.1 Startup

Figure 3-1 shows the initial user interface by starting up RKSLAM Demo.

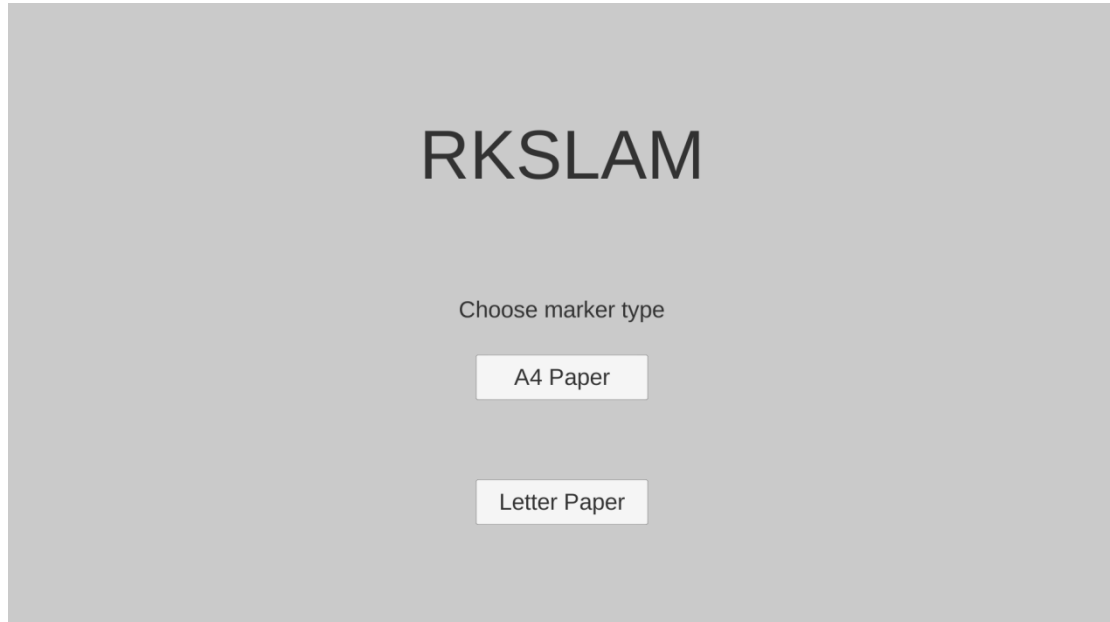


Figure 3-1. The main user interface.

: Initialize the system with an A4 size paper

: Initialize the system with a letter size paper.

2.2 Initialize the system

Click , or click in the main user interface, then a camera preview will show up

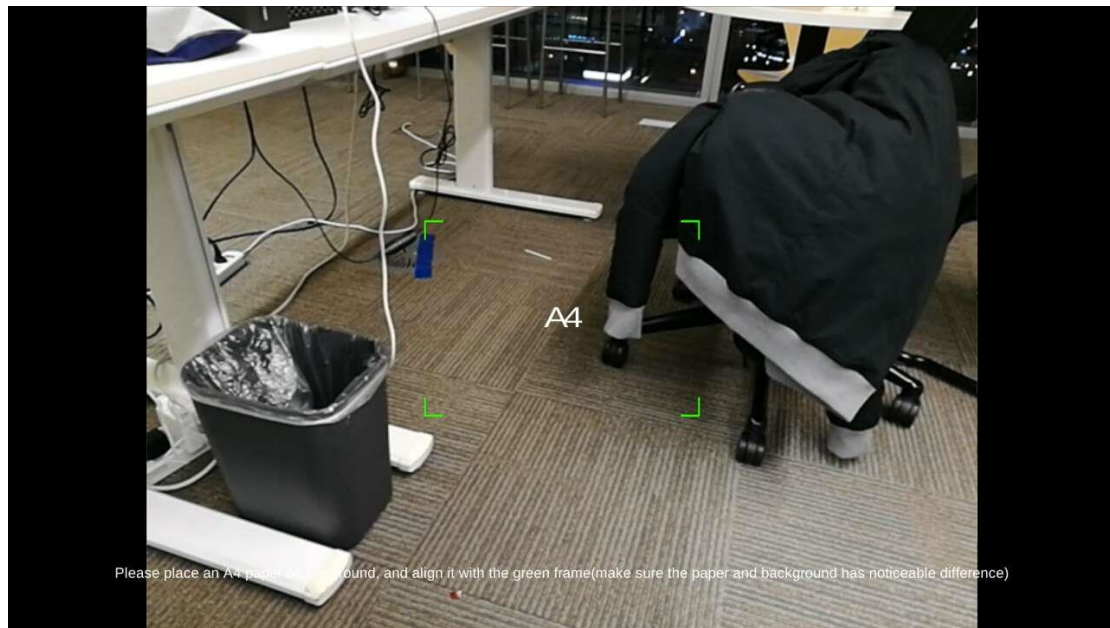


Figure 3-2. Initialization with an A4 paper.

Place an A4 paper (or letter paper based on your choice) on a plane, aim the frame at the paper and the system will be initialized.

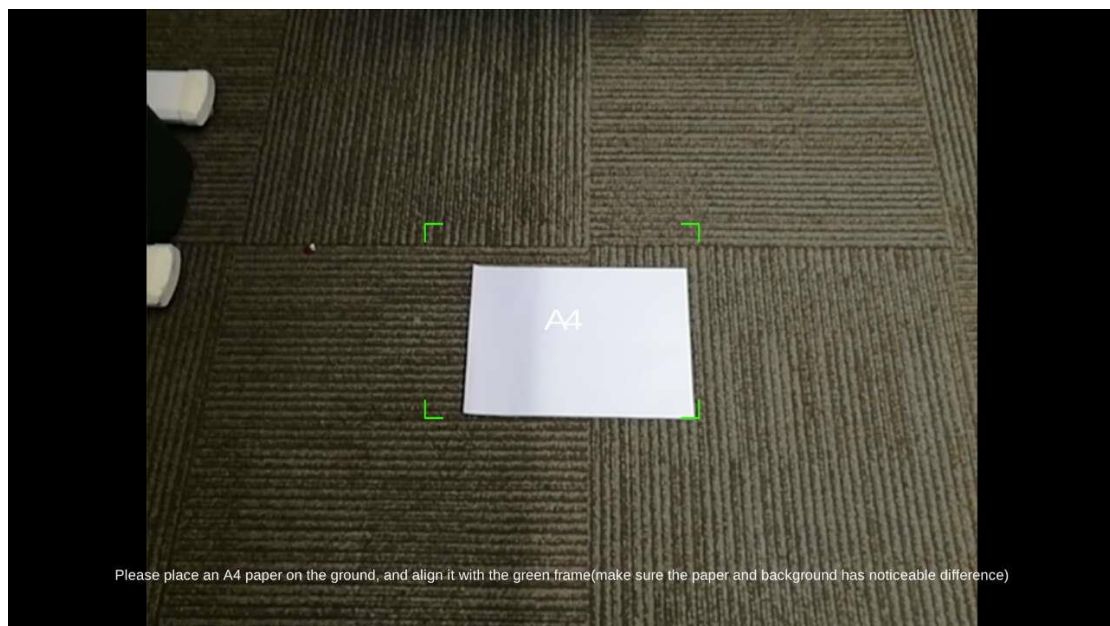


Figure 3-3. Aiming the green frame at the marker.

Once the system is successfully initialized, you will see the coordinate axis in the center of the marker.

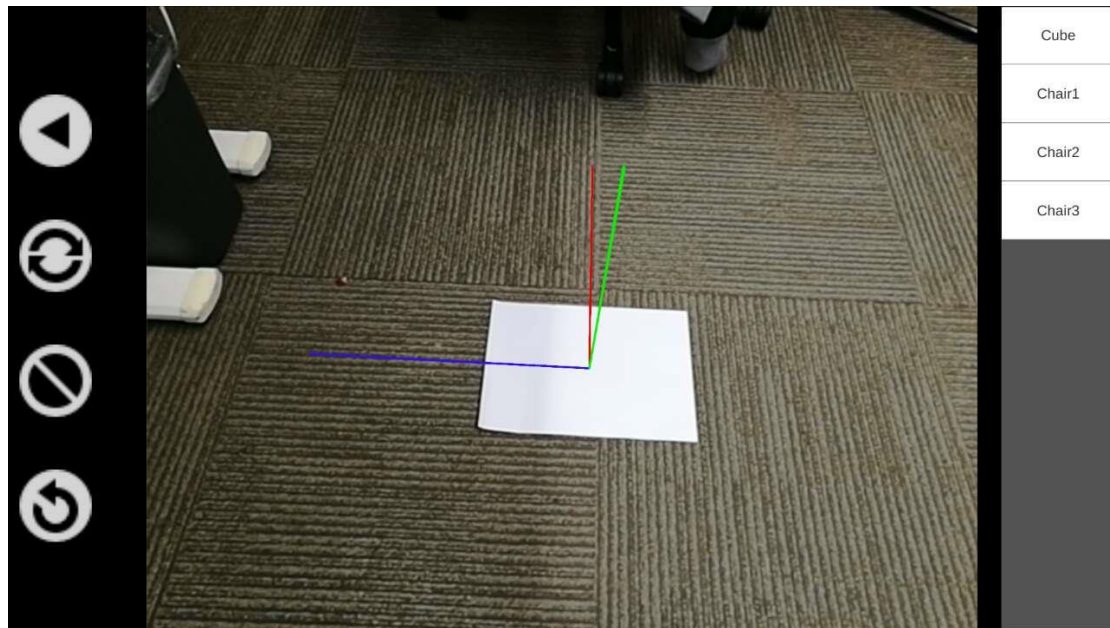


Figure 3-4. Successfully initialized with a marker.

2.3 Interactions with virtual objects

2.3.1 Placing virtual objects

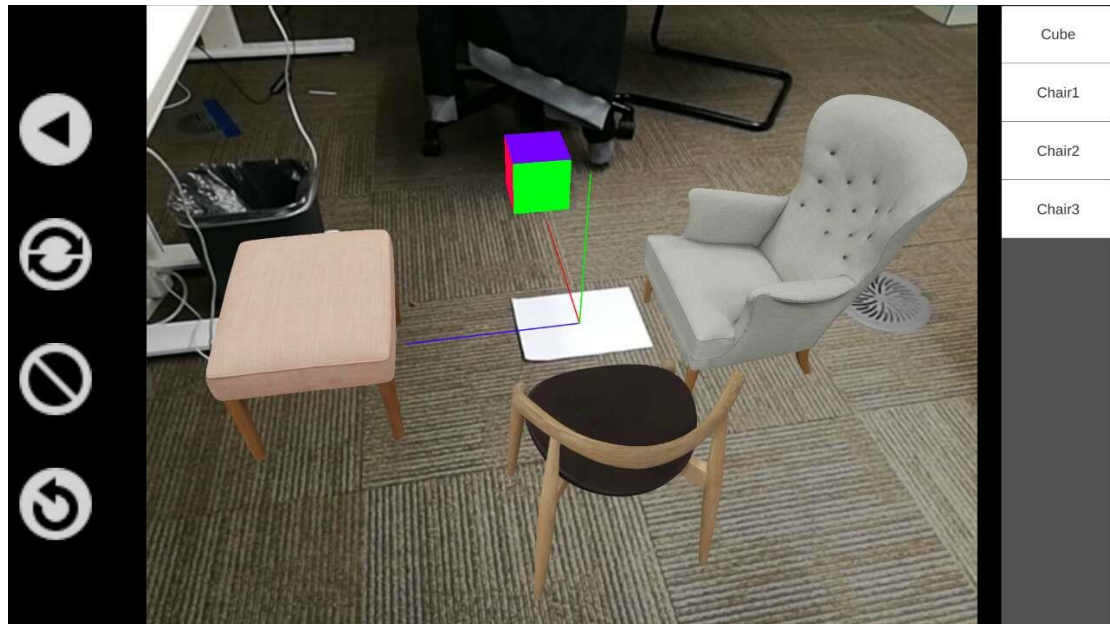


Figure 3-5 Placing virtual objects in the scene

You can place virtual object in the scene by simply clicking the buttons on the right menu. There are four models to choose in total.

2.3.2 Selecting virtual objects

You can select the virtual object by clicking it. The object selected will be yellow like the sofa in the following example.

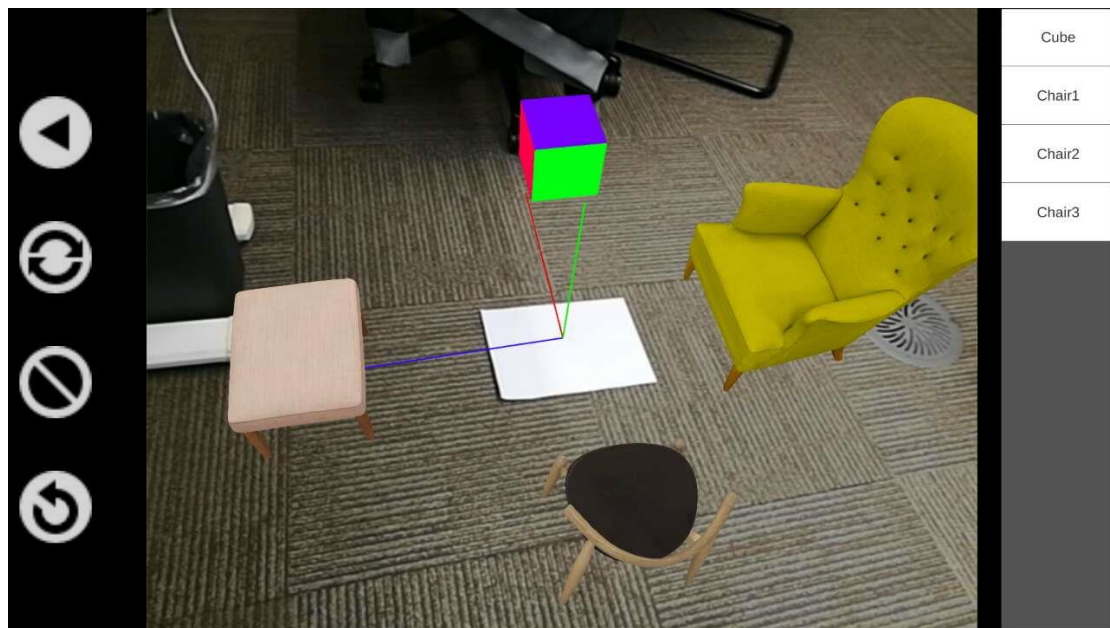


Figure 3-6 Selecting virtual objects in the scene

2.3.3 Moving virtual objects

You can move the object once you have selected it, by dragging the object on screen to the position you want.

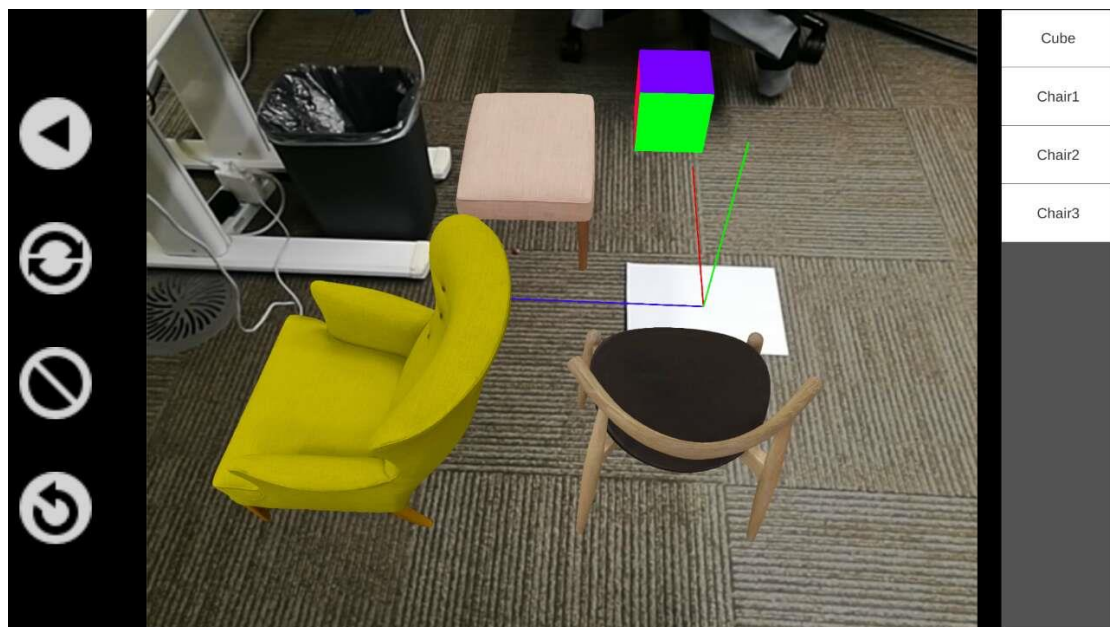


Figure 3-7 Moving virtual objects in the scene

2.3.4 Rotating virtual objects

You can rotate the object once you have selected it, rotate it **counter-clockwise** by **swapping left**

with **two fingers** on the screen. You can rotate it **clockwise** by **swapping right** with **two fingers** any where on the screen.

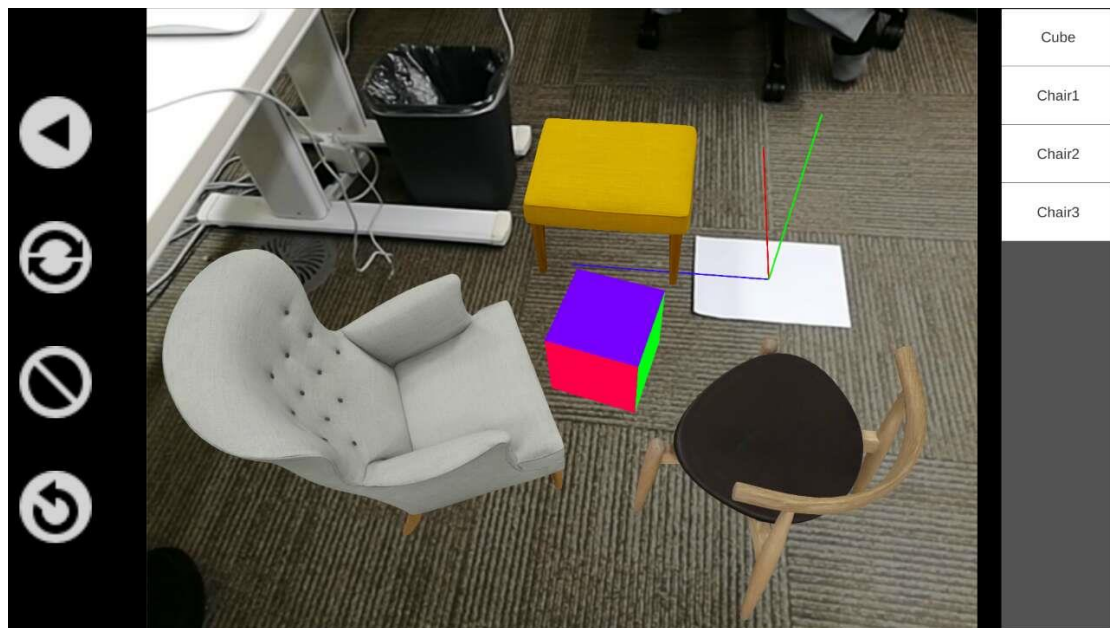


Figure 3-8 Rotating virtual objects in the scene

2.3.5 Resizing virtual objects

You can resize the object once you have selected it, and **shrink** it by **swapping left** with **three fingers** on the screen. You can **enlarge** it by **swapping right** with **three fingers** on the screen.

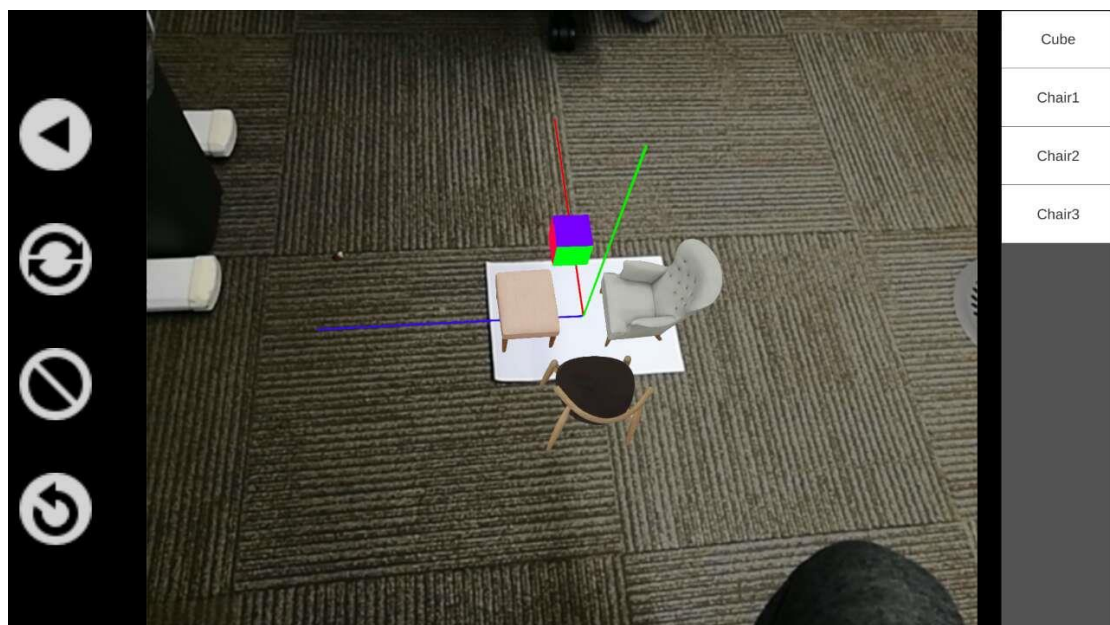




Figure 3-9 Resizing virtual objects in the scene

2.4 Other Interactions


2.4.1 Back to main menu

Go back to the main menu by clicking the upper left button  .


2.4.2 Re-initialize

If the tracking gets lost and you want to re-initialize, click the  button.

2.4.3 Deleting Objects

If you want to delete objects in the scene, select it (the object will be yellow if selected) and click the  button in the left menu.

2.4.4 De-selection

If you want to de-select some objects in the scene for screenshot or some other reason, de-select it (the object will be non-yellow if not selected) by clicking the  button in the left menu.

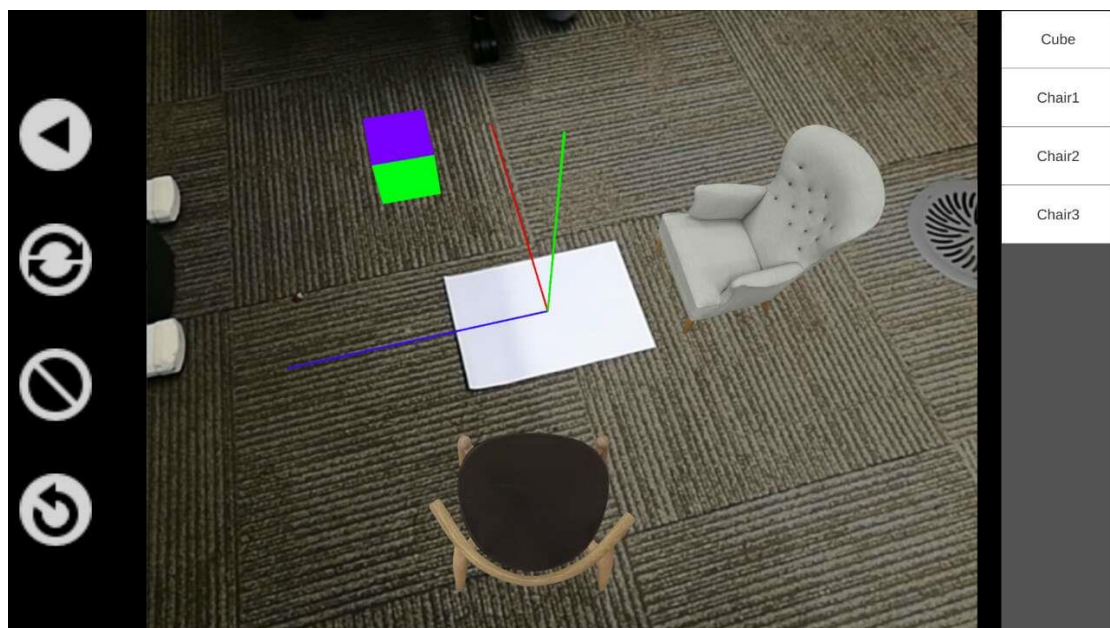


Figure 3-10 De-selecting virtual objects in the scene