AUGMENTED REALITY
COCSE57

Practical File

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Section/Batch - 3/1

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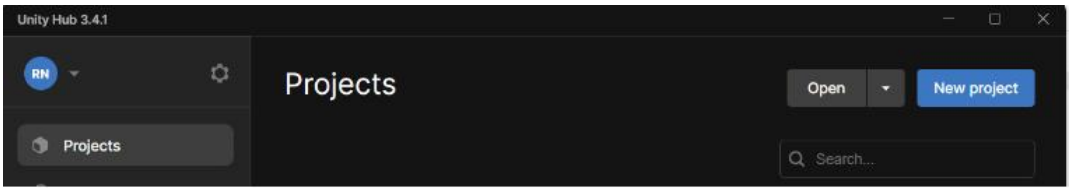
Experiment 1 :
Build an Augmented Reality application having 3D object in it using Unity.

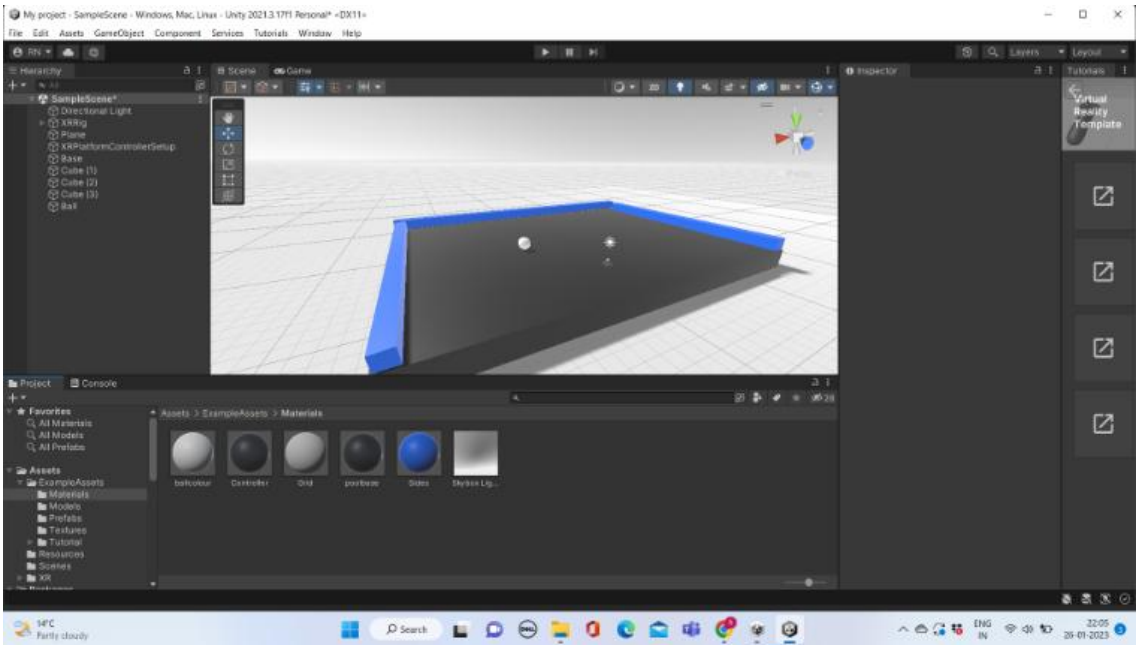
Solution

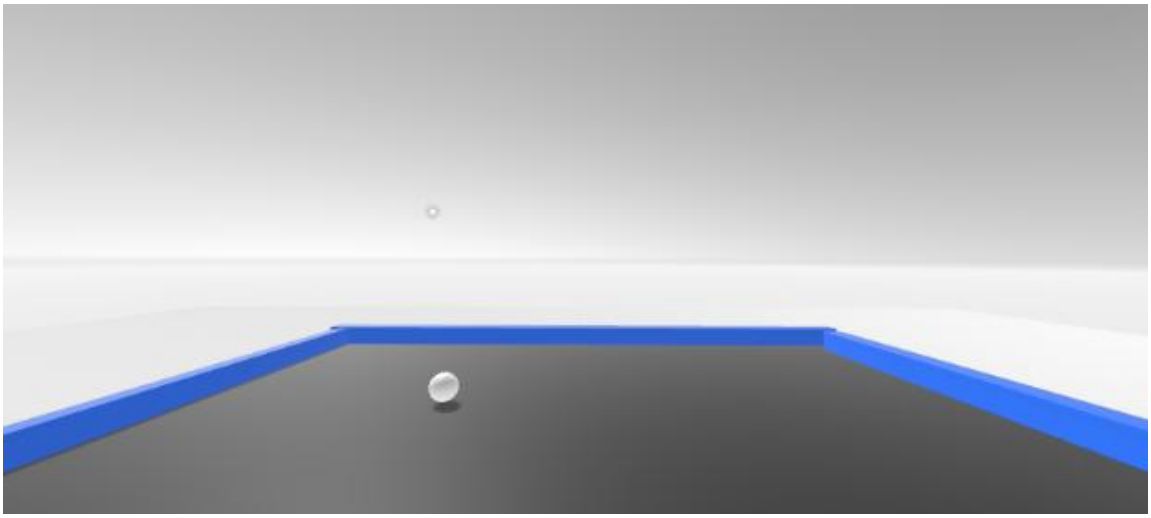
1. Installed Unity Hub from Unity Website (https://store.unity.com/download?check_logged_in=1)
2. Installed Unity Editor using Unity Hub
3. Create a new Project and use AR template



4. Create different 3D objects by selecting the shapes from dropdown in GameObject
5. Create a Material file to colour the shapes

Screenshot





Components Required

1. OS: Windows 7 SP1+, 8, 10, 64-bit versions only; macOS 10.12+; Ubuntu 16.04,
18.04, and CentOS 7.
2. GPU: Graphics card with DX10 (shader model 4.0) capabilities.
3. Unity Hub
4. Unity Editor

Difficulties Faced

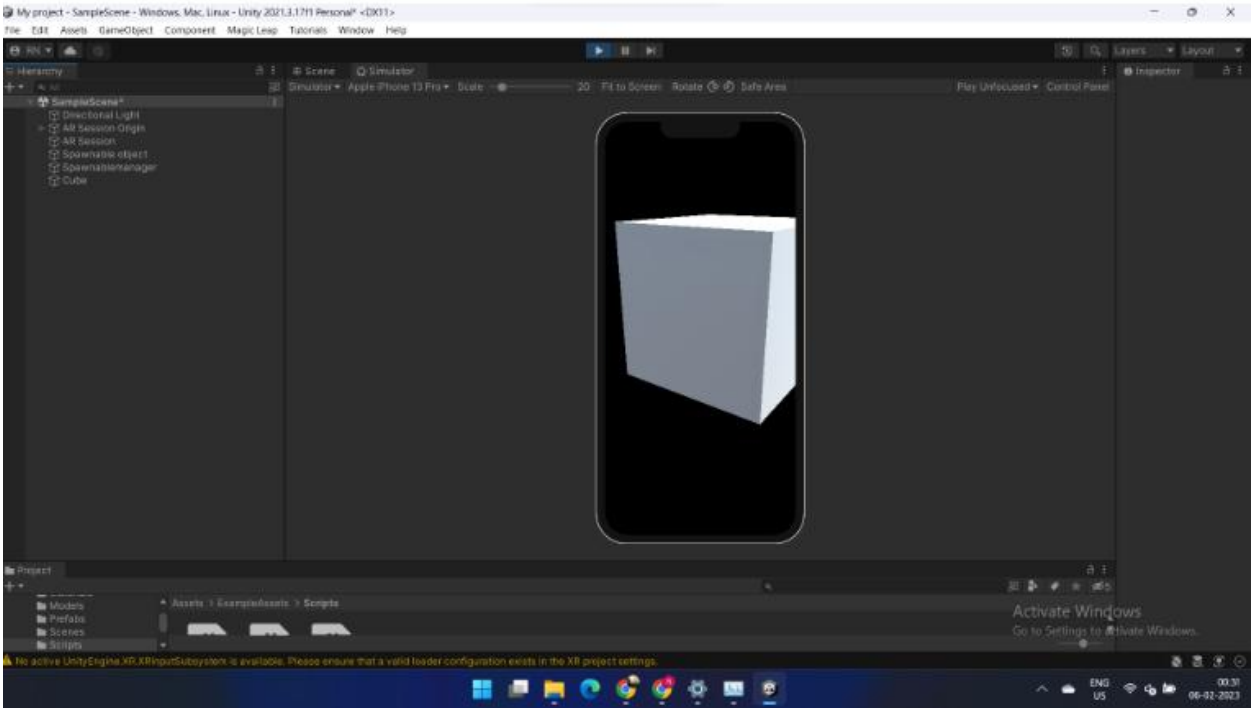
1. Unity is heavy software, running it requires a lot of time
2. Exploring unity software
3. Adding colour to the shapes

Experiment 2 :
Build an Augmented Reality application having Placement Indicator
to summon 3D object in it using Unity.

Solution

1. Installed AR Foundation package
2. Configured scene for AR Foundation and Plane detection
3. Created the interaction script
4. Configured the build settings for android

Screenshot



Components Required

1. OS: Windows 7 SP1+, 8, 10, 64-bit versions only; macOS 10.12+; Ubuntu 16.04,
18.04, and CentOS 7.
2. GPU: Graphics card with DX10 (shader model 4.0) capabilities.
3. Unity Hub
4. Unity Editor

Difficulties Faced

1. Unity is heavy software, running it requires a lot of time
2. Exploring unity software
3. Making apk for the app

Experiment 3 :

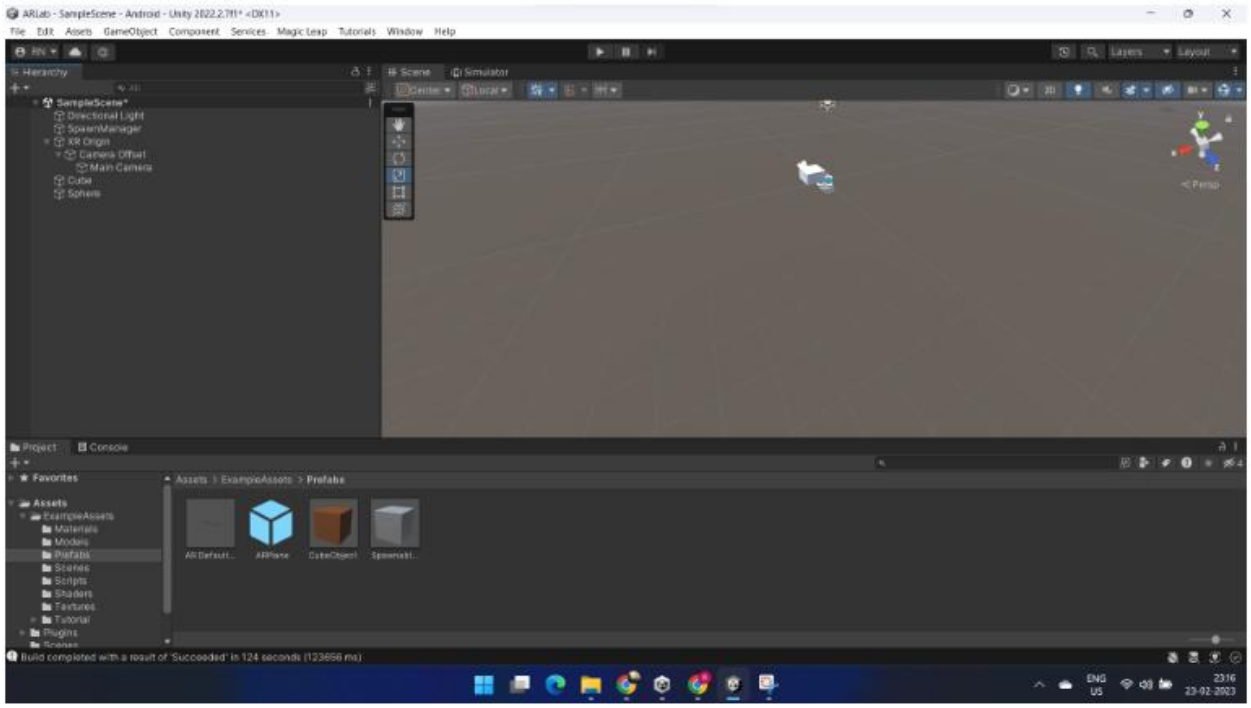
Build an Augmented Reality application using Unity –

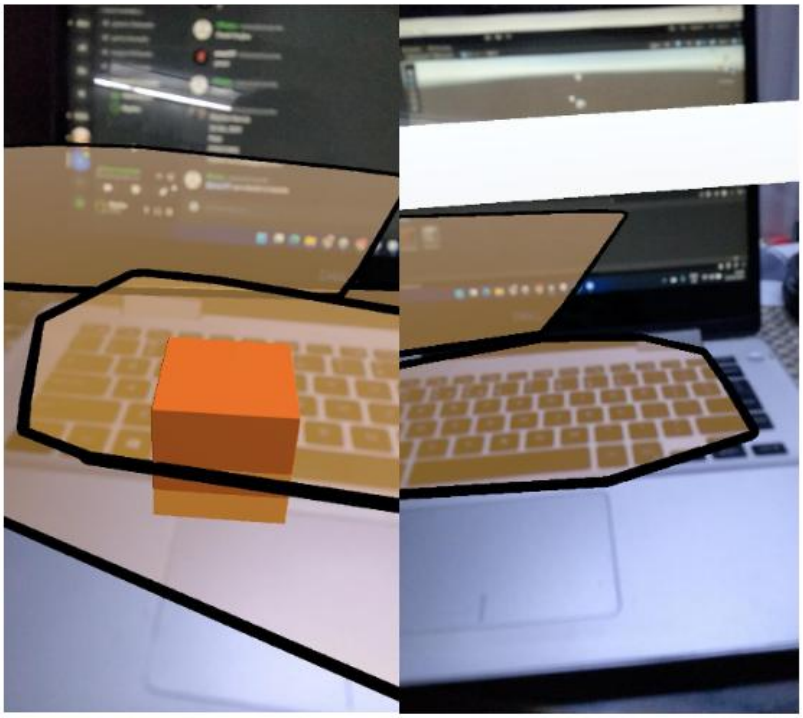
1. **Insert multiple AR objects**
2. **Summon multiple AR objects**
3. **Use arrows as placement indicator to summon multiple AR objects**

Solution

1. Installed AR Foundation package
2. Configured scene for AR Foundation and Plane detection
3. Created the interaction script
4. Configured the build settings for android

Screenshot -





Components Required

1. OS: Windows 7 SP1+, 8, 10, 64-bit versions only; macOS 10.12+; Ubuntu 16.04,
18.04, and CentOS 7.
2. GPU: Graphics card with DX10 (shader model 4.0) capabilities.
3. Unity Hub
4. Unity Editor

Difficulties Faced

1. Unity is heavy software, running it requires a lot of time
2. Exploring unity software
3. Making apk for the app

Experiment 4:

Build an Augmented Reality application using Unity –

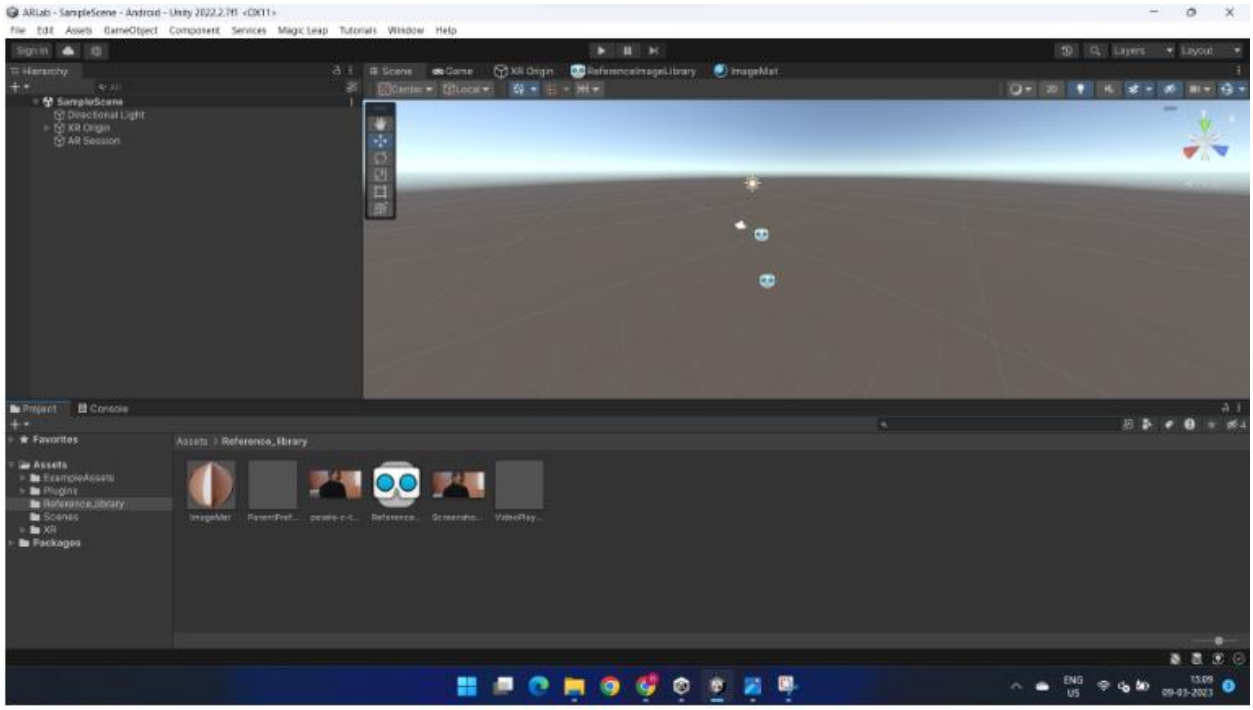
1. **Tracking an Image on plane to play video**
2. **Insert Image to track and video to play in Unity**
3. **Use Unity AR Foundation packages to play a video using AR**

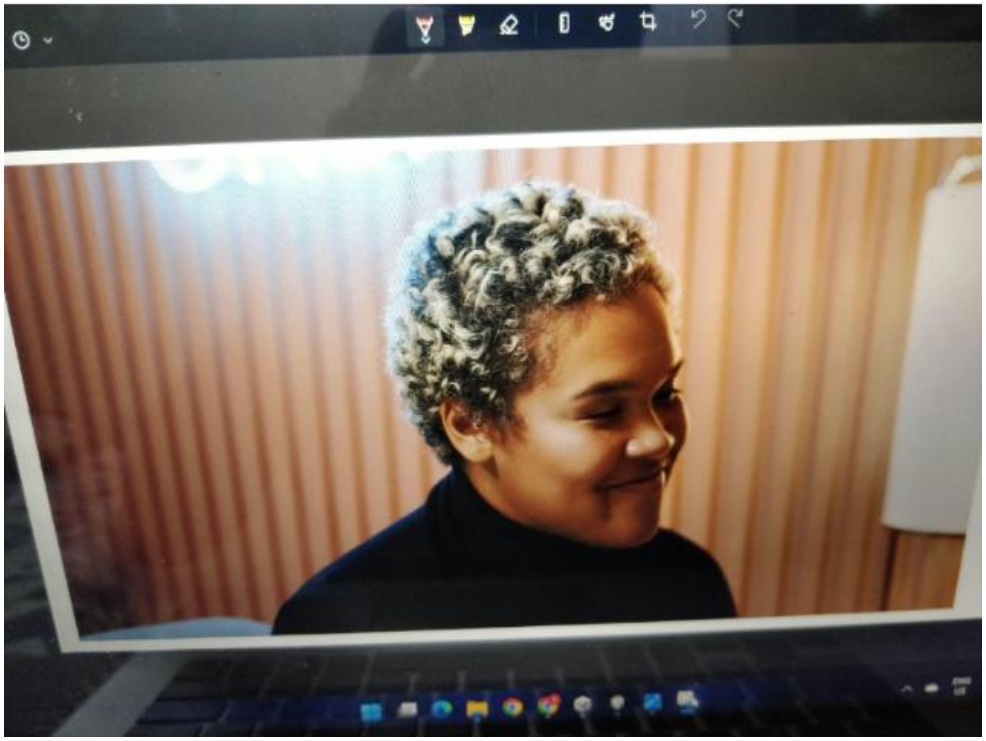
Image Tracking

Solution

1. Installed AR Foundation package
2. Configured scene for AR Foundation and Plane detection
3. Created the interaction script
4. Configured the build settings for android

Screenshot -





Components Required

1. OS: Windows 7 SP1+, 8, 10, 64-bit versions only; macOS 10.12+; Ubuntu 16.04,
18.04, and CentOS 7.
2. GPU: Graphics card with DX10 (shader model 4.0) capabilities.
3. Unity Hub
4. Unity Editor

Difficulties Faced

1. Unity is heavy software, running it requires a lot of time
2. Exploring unity software
3. Making apk for the app

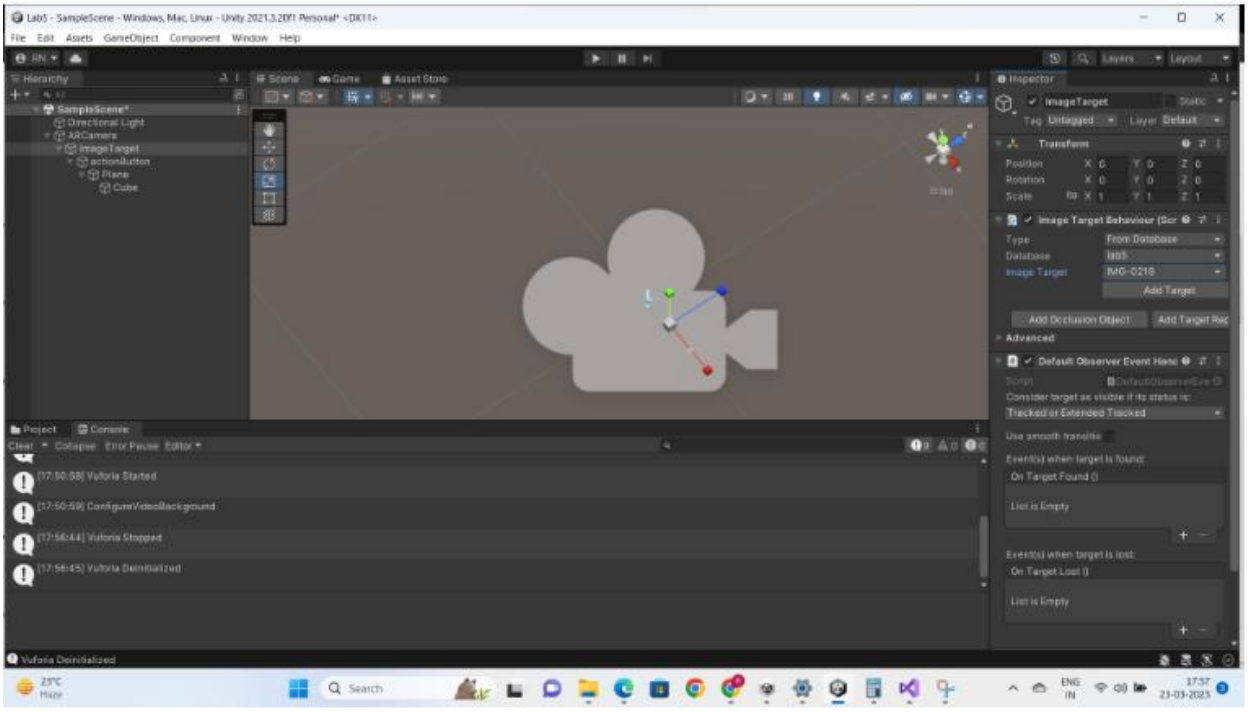
Experiment 5:
Build an Augmented Reality application using Unity and Vuforia –

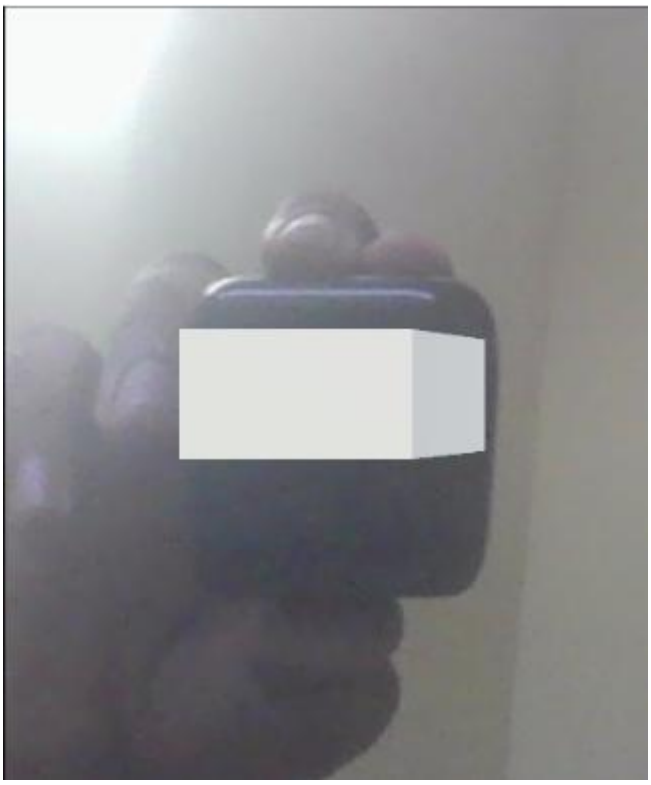
1. **Create virtual buttons**
2. **Use virtual buttons to perform any task**
3. **Task - To move any 3D object, rotate any 3D object, etc.**

Solution

1. Installed Vuforia package in unity
2. Downloaded database from vuforia site after adding target image
3. Added virtual buttons
4. Created the interaction script
5. Configured the build settings for android

Screenshot





Components Required

1. OS: Windows 7 SP1+, 8, 10, 64-bit versions only; macOS 10.12+; Ubuntu 16.04,
18.04, and CentOS 7.
2. GPU: Graphics card with DX10 (shader model 4.0) capabilities.
3. Unity Hub
4. Unity Editor
5. Vuforia package
6. Database downloaded from vuforia and added to unity

Difficulties Faced

1. Unity is heavy software, running it requires a lot of time
2. Exploring unity software

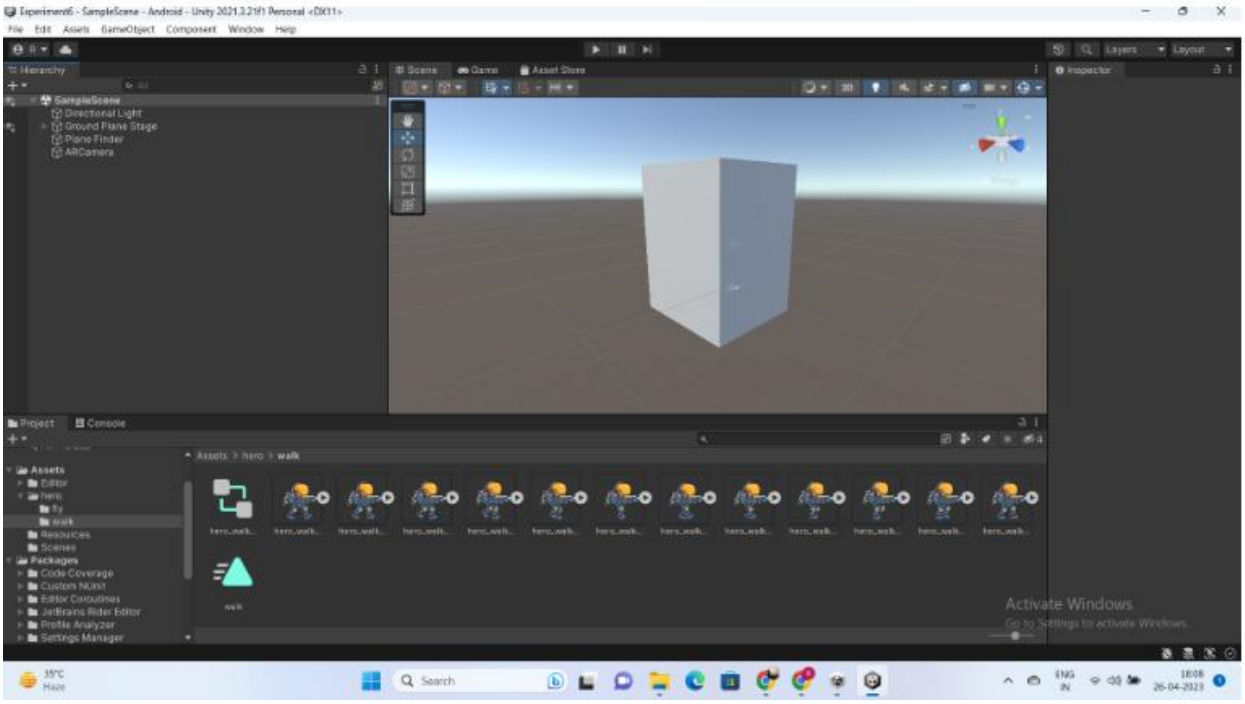
Experiment 6:
Build an Augmented Reality application using Unity and vuforia –

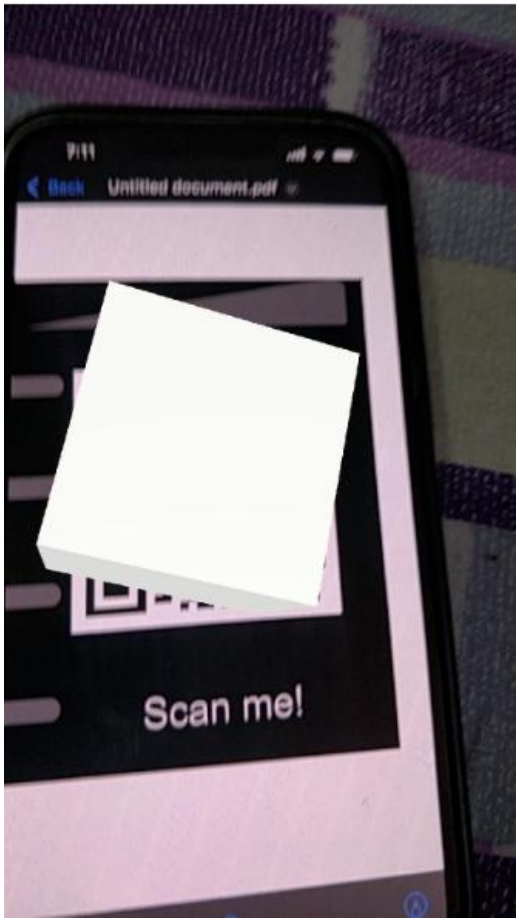
1. **Insert an AR object (ex. Cube, sphere, etc.)**
2. **Summon an AR object**
3. **Demonstrate the AR object by spinning it on plane**

Solution

1. Import vuforia package
2. Add target images to vuforia database
3. Import the database into the project
4. Add a Vuforia image target object to the hierarchy
5. Select your target image from imported database

Screenshot





Components Required

1. OS: Windows 7 SP1+, 8, 10, 64-bit versions only; macOS 10.12+; Ubuntu 16.04,
18.04, and CentOS 7.
2. GPU: Graphics card with DX10 (shader model 4.0) capabilities.
3. Unity Hub
4. Unity Editor
5. Vuforia

Difficulties Faced

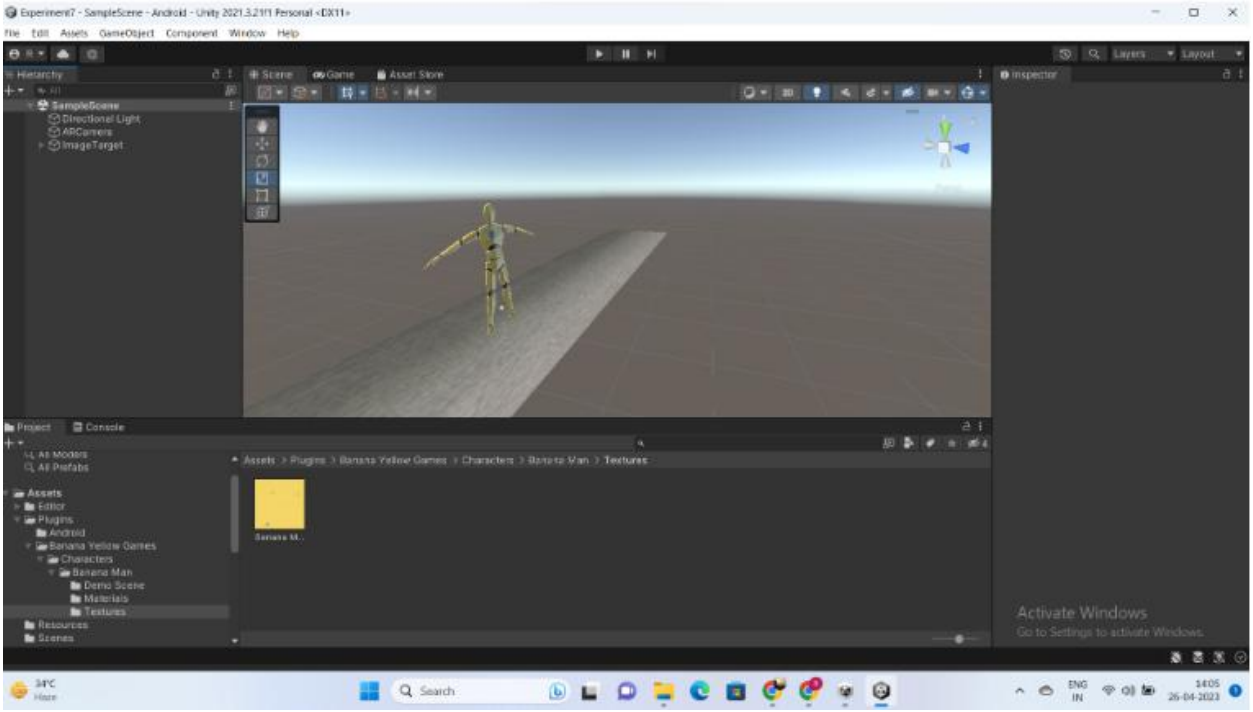
1. Unity is heavy software, running it requires a lot of time
2. Exploring unity software
3. Making apk for the app

Experiment 7:
Develop an Augmented Reality application using Unity and Vuforia
that allows users to create and interact with a 3D model of an object
using a 2D image as a target.

Solution

1. Import vuforia package
2. Add target images to vuforia database
3. Import the database into the project
4. Add a Vuforia image target object to the hierarchy
5. Select your target image from imported database

Screenshot



Components Required

1. OS: Windows 7 SP1+, 8, 10, 64-bit versions only; macOS 10.12+; Ubuntu 16.04,
18.04, and CentOS 7.
2. GPU: Graphics card with DX10 (shader model 4.0) capabilities.
3. Unity Hub
4. Unity Editor
5. Vuforia

Difficulties Faced

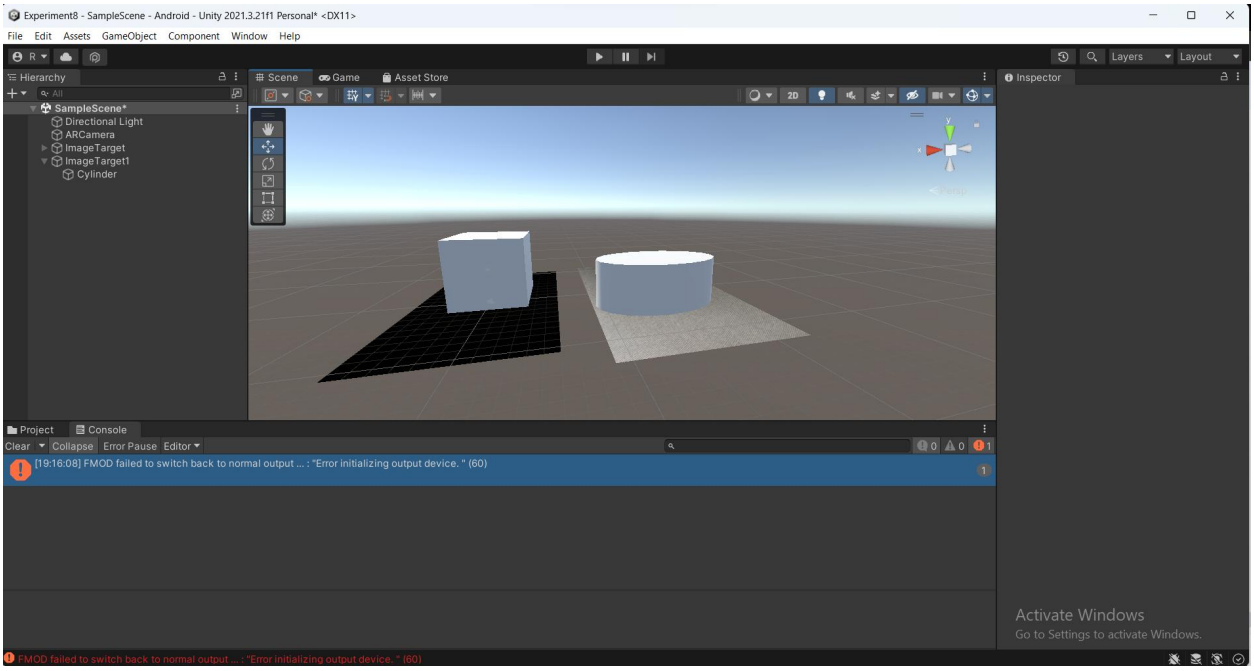
1. Unity is heavy software, running it requires a lot of time
2. Exploring unity software
3. Making apk for the app

Experiment 8:
Develop an Augmented Reality application using Unity and Vuforia that can recognize multiple images as target and display corresponding 3D model of an object.

Solution

1. Import vuforia package
2. Add target images to vuforia database
3. Import the database into the project
4. Add a Vuforia image target object to the hierarchy
5. Select your target image from imported database
6. Add a 3D model of the target image corresponding to its target object

Screenshot



Components Required

1. OS: Windows 7 SP1+, 8, 10, 64-bit versions only; macOS 10.12+; Ubuntu 16.04,
18.04, and CentOS 7.
2. GPU: Graphics card with DX10 (shader model 4.0) capabilities.

3. Unity Hub
4. Unity Editor
5. Vuforia

Difficulties Faced

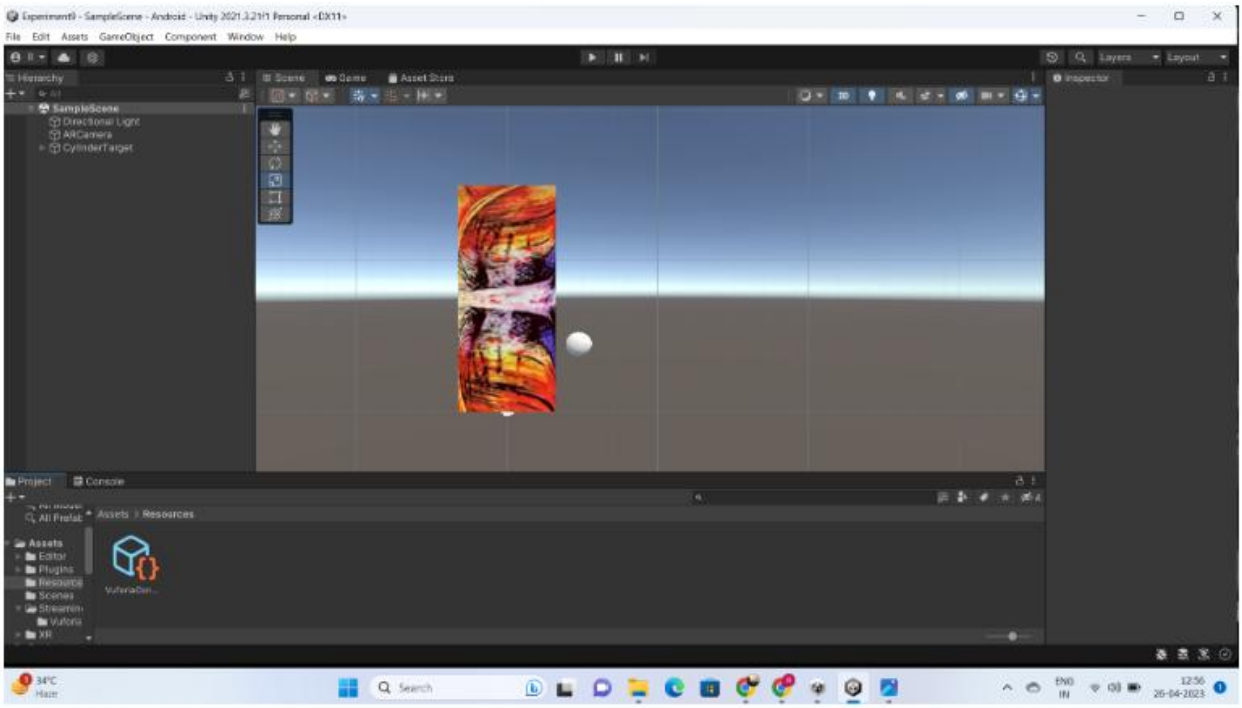
1. Unity is heavy software, running it requires a lot of time
2. Exploring unity software
3. Making apk for the app

Experiment 9:
Develop an Augmented Reality application using Unity and Vuforia
that can recognize cylindrical object as target and display corresponding 3D model of an object.

Solution

1. Import vuforia package
2. Add images of the cylinder to vuforia database
3. Import the database into the project
4. Add a cylinder object to the hierarchy

Screenshot



Components Required

1. OS: Windows 7 SP1+, 8, 10, 64-bit versions only; macOS 10.12+; Ubuntu 16.04,
18.04, and CentOS 7.
2. GPU: Graphics card with DX10 (shader model 4.0) capabilities.
3. Unity Hub
4. Unity Editor
5. Vuforia

Difficulties Faced

1. Unity is heavy software, running it requires a lot of time
2. Exploring unity software
3. Making apk for the app