CMP3754M Virtual and Augmented Reality

Workshop 8 : Getting Started With AR

Objectives:

1. Orientation to development tools
2. Deploying a first AR application

Duration: 45 Minutes
Platform: *Unity 6 (version = 6000.0.55f1 LTS)*

By completing this workshop you will build functionality that you can use to complete your assessment for this module

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1. Welcome to Part 2 of the virtual and augmented reality workshops!

We now know how to build VR applications using Unity 6. We are going to build further on this knowledge and learn how to build Augmented Reality apps.

For these workshops, we will be building AR application components that deploy on an Android phone. Phones are provided for you in class, or you can also use your own (if it supports the AR features that we will use). In principle, we can also build for iOS devices using the same procedures; however, to build for iOS you need to use a Mac PC or laptop. We don't have these facilities in the lab, so this is not supported for our workshops, but if you have that equipment at home and want to try it out, please do so.

2. About these Workshops and Your Assessment

You are now working towards your second assessment. You will undertake a series of workshops that build a suite of useful AR functions. You can use these functionalities to complete your assessment. Therefore, it is important that you complete the workshops.

3. Working in the Labs with the Phones

The school has Android phones which you can use to complete your workshops. In each workshop session, a member of staff will bring the phones to class. You can collect a phone from your lecturer at the start of the session, and you must then return it at the end. You can then work with the phone at your desk. If you experience any issues with the equipment, please report this when you check it back in.

The phones plug into a PC using a USB cable, and have been configured for development so that you can run your workshop tasks on them using Unity.

There are some important rules for using the phones, which you must follow:

- You must not take the phone or accompanying equipment outside of the laboratory in which you are doing you workshops.
- You must use the phone as it is, with the provided Google account. Do not install any software other than your own work, and do not use your own Google account.
- The labs can be crowded. Do not jump, walk, run, or make sudden movements (especially with your hands) whilst using the phone.
- Do not do anything that might damage the phones: we only have limited numbers available in the school.

We cannot allow anyone to be in an unsafe situation in the lab. If you do not follow these rules, you may be asked to stop using the phones for the rest of the session, to ensure your safety, and the safety of those around you.

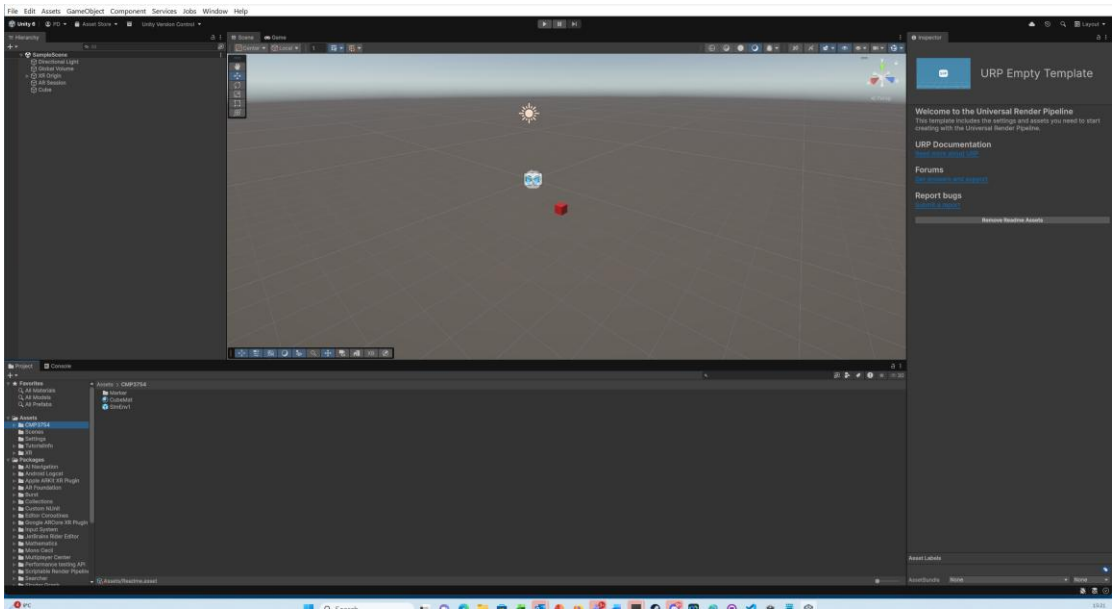
You will also find an associated health and safety risk assessment for using the phones equipment in class on Blackboard, which you should study.

4. Setting up a New Project

We are going to get straight into doing some development work. As before, I have created a starter app for you, using Unity 6 (*version = 6000.0.55f1 LTS*). You should be able to update this to a later versions of Unity, as they become available in the lab.

If you create the project at home, make sure you have the right version of Unity installed, along with the Android Build Support for that version.

Download the zipped project, AR-Workshops-Unity6-2526.zip, from Blackboard. Unzip it, and open it in Unity. It should look something like this:

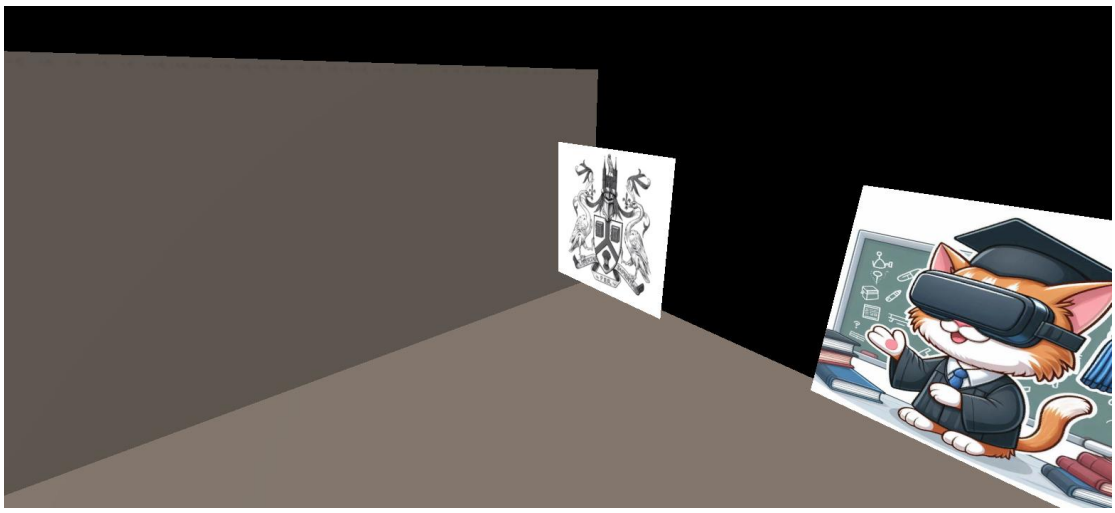


Some things to note:

- In the hierarchy there is an XR Origin object, and also an AR Session object. These are the basic components of an AR project in Unity.
- The only game object in the hierarchy is a red cube (for testing purposes).
- There is a directory called CMP3754 in the Assets folder. I have already put some resources in there to get you started.

5. Running the Project

As for the VR project you used before, there is a “simulation mode” you can use to quickly test features in the editor without having to deploy to a phone. The simulation is very simple, and doesn’t replicate all AR functions, but it is still useful. To run the simulation, just press the editor **Play** button. You should see something like this:



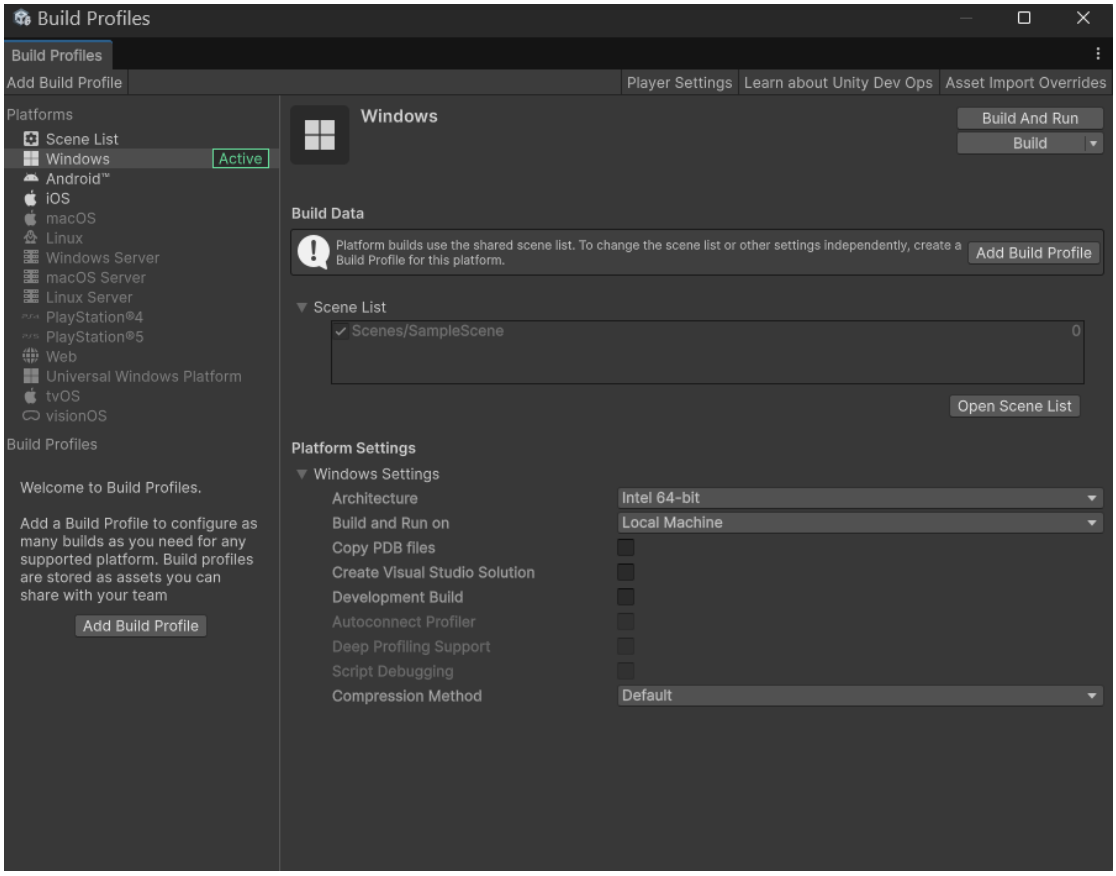
The images are just there to test marker detection (next workshop). You can look around and move by holding down the right mouse button, and then using the mouse to rotate view, and the WSAD keys to move. You should be able to see the red cube as you look around. Exit the play mode.

6. Deploying to an Android Device

You are now going to deploy this simple project to an Android phone. As mentioned, phones are provided for you in class. You don't need to use your own phone for development; but, if you want to do so, then you need to enable developer mode. This is straightforward, and you can find instructions for how to do it online. If you do use your own phone, we recommend that you only enable developer options when you are using your phone for development work, as it can leave your phone more open to security risks. If you are unsure about using your own phone, then don't – we have phones that you can use in the labs to complete your workshops and assignment.

Plug the phone into your PC using a USB cable.

Open **File>Build Profiles** (like we did for the VR headsets). You should see something like this:

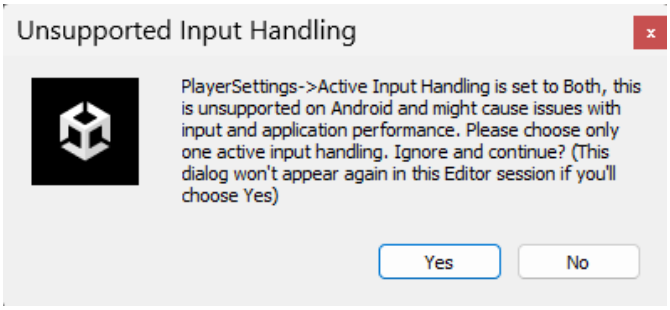


Ensure that the **SampleScene** scene is selected in the list above the Platform Settings.

Select **Android** in the Build Profile list, and then select the phone in the **Run Device** field.

Select **Switch Platform** in the top right corner of the dialogue. This will start a process that will take a few minutes to complete.

Make sure that the phone is still selected as the **Run Device**, and then select **Build and Run**. Enter a name for the generated APK file. I just called mine "ARWorkshop". Next you should see a dialogue like this:



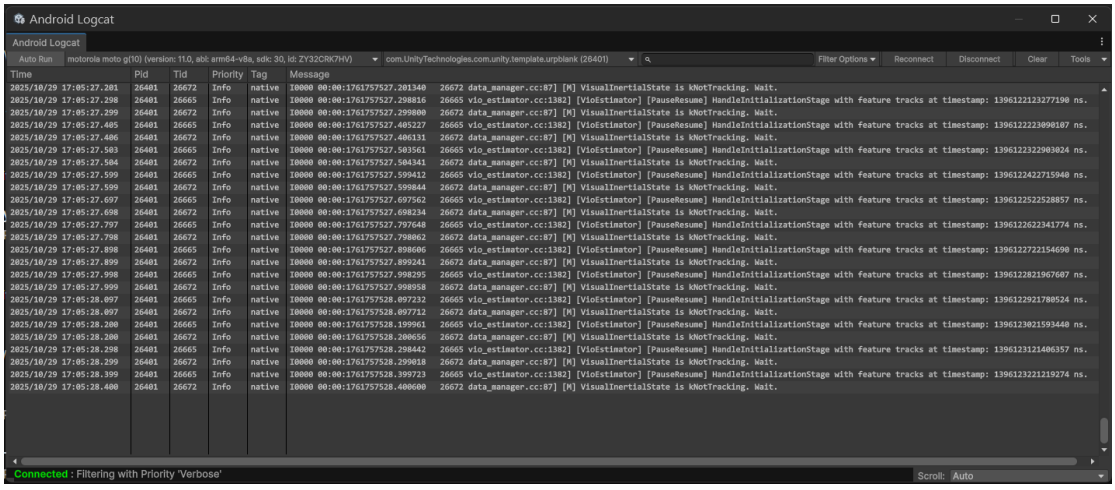
Just select **Yes** to ignore this warning whenever you see it.

Unity will now build the app and deploy it to your phone. The first time you do this it will take a relatively long time (approx. 10 mins). When complete, you will probably see a dialogue on the phone asking permission for the app to record images and video. Select "While Using the App".

The app should then show you the video feed from the phone camera. If you look around with the phone, you should also find the red cube added into the scene.

7. Logcat

When the AR app launches on the phone, you should also see the "Logcat" screen appear on your PC:



This enables you to see debugging info generated by the app on the phone device. You can add your own debugging from any C# scripts that you write using the **Debug.Log()** command. There is a lot of debugging data in the Logcat screen, but you can filter messages using the search function. This facility s very useful for debugging on the device.

8. Conclusion.

You now know how to deploy the AR workshop starter app to the phone, and how to run an AR app in the simulator. In the next workshops we will add some functionality to support marker based detection, plane detection, object creation, and UI features.