

Augmented Reality Development with Unity

Course Summary

Description

In this course, students will learn to create VR and AR apps using industry standard tools Unity 3D and C#. Course participants will build a personal VR or AR application for their portfolio or as a project for a client. Training will be delivered onsite by certified VR and AR instructors. Instructors are approved based on their expertise, focus on quality education, and commitment to providing the highest level of training available.

Objectives

At the completion of this course, Students will:

- Create your own VR or AR idea in Unity
- Design for leading VR and AR platforms
- Manage production of VR and AR projects
- Effectively design applications around the benefits of VR and AR
- Collaborate on team Unity projects
- Connect to a powerful network in the VR and AR industry

Topics

- Introduction to Unity
- Introduction to Scripting, AR and Design Best Practices
- Removing Digital Objects, Creating a User Interface, AR interaction
- Introduction to VR Headsets and Their Setup
- Grabbing Things And Force In VR
- Reviewing and Throwing Objects, Factory AR
- VR Interactions and Audio
- Raycasting to Teleport and to Grab
- Advanced Mechanics and Moving With the Trackpad.
- Collaborating, Optimizing and Building Your Application!

Prerequisites

Experience in multimedia or technical software is beneficial. This is a beginner friendly course, no previous experience is required. Students who have no programming experience will be guided with beginner coding resources. We will provide additional course preparation material to learn the fundamentals of programming and C#. All students with programming experience will be provided additional resources.

- Each participant will need to bring a laptop (Windows or OSX), power supply and mouse
- Install the free version of Unity 2019.0 or greater prior to the workshop
- VR/AR devices will be supplied for each participant

Duration

Five Days

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Course Outline

I. *Introduction to Unity*

- A. Introduction to the Instructor
- B. Unity Overview: Unity Windows, Interface, Navigation, Terminology, GameObjects, Hierarchy, Parenting Objects
- C. Asset Store, Importing Plugins
- D. Materials (Colors, Metallic vs smoothness) (Emission, transparency and custom)
- E. Creating a Terrain
- F. Introduction to Monobehaviours (Awake, Start, Update)
 1. Pacing Cube
 2. Overview of VR Devices and their representation in scene

II. *Introduction to Scripting, AR and Design Best Practices*

- A. Vuforia Image Target with 3D cube then Model
- B. Character Controller Input/Output
- C. Input
 1. Getting input from Keyboard;
 2. Setting up Unity Input (Axis)
 3. Discuss controller input
- D. Overview of Physics
- E. Custom Image Target
- F. Creating GameObjects via Scripts (new GameObject, prefabs)
- G. Accessing Components through Scripts
- H. Debug.Log
- I. Lists, Loops

III. *Removing Digital Objects, Creating a User Interface, AR interaction*

- A. Creating and using tags
- B. OnTriggerEnter and OnCollisionEnter
 1. Removing Objects
 2. Painting Objects
- C. Manipulating components in Scripts
- D. 2 Tracked image Interaction (AR)
- E. Accessing values from other scripts
- F. Introduce Private variables concept
- G. User Interface
- H. Screen space Overlay
- I. World Space (VR/AR related)

IV. *Introduction to VR Headsets and Their Setup*

- A. Setting up OpenVR for cross platform
- B. Create a simulated hand for non VR users/Mobile VR users
- C. Animation
- D. Grabbing objects via Parenting and Animating our hands
- E. Pushing objects around

V. *Grabbing Things and Force In VR*

- A. Complex Colliders
- B. Unique ability with different objects held (ie. shoot, FlashLight)
- C. OnTriggerDown on vs OnTrigger
- D. Implement Flags for openvr.
- E. Grab snaps object to corrected position

VI. *Reviewing and Throwing Objects, Factory AR*

- A. Errors, Physics, colliders, coding, Types/Components Physics materials and cloth
- B. Fixed joint vs Parenting
- C. Throwing Objects via Fixed joints
- D. Throw in basketball into hoop
- E. Utility AR app walk through

VII. *VR Interactions and Audio*

- A. Creating our own custom Vuforia script (counter)
- B. Audio and lighting implemented with in the following
- C. Touch button, Spring joints, Hinge joints, Turn dials
- D. Create a Piano with a volume control

VIII. *Raycasting to Teleport and to Grab*

- A. Raycasting
- B. Use in Desktop VR, Mobile VR, and AR
- C. Implement movement mechanics
- D. AR Decision Tree

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Course Outline (cont.)

- IX. *Advanced Mechanics and Moving With The Trackpad.***
 - A. Moving with Trackpad
 - B. Video Textures
 - C. Deadzone, Trackpad Division
 - D. Ground plane measuring app
 - E. Review

- X. *Collaborating, Optimizing and Building Your Application!***
 - A. Unity Collaboration
 - B. Changing the default icon/name/company
 - C. Building your application
 - D. Publishing apps that perform consistently at 90fps (desktop) or 60fps (mobile)
 - E. Review
 - F. Resources and Next Steps