

COSC 829: Advanced Virtual Reality Systems
Fall Semester 2019
Instructor: Dr. Sharad Sharma
Assignment 1: Multi-User VR Environment

This project will create a multi-user virtual reality environment using Vizard or Unity 3D. In this project you will create a **VR University** environment.

Please submit your assignment by: **9/11/2019**

Submission:

Submit your code files and all scene assets in the SHARMASHARE directory on the network.
[:\SSharma Share\COSC829-Submissions\Assignment1]

You are expected to create an entire virtual environment that combines 3D Studio Max models and WorldViz Vizard coding. You will be required to do the following:

1. **Modeling:** Create a building and at least 8 classrooms
 - a. You can use freely available 3D models over the internet.
 - b. You have to use textures
 - c. At least 12 **UNIQUE** models
 - i. Must be different models (computers, benches, chairs, etc)
 - ii. Must be uniquely textured
 - iii. Can use simple animations in Max or in Vizard
 - iv Add environmental assets to your Scene such as trees, grass, bushes, rocks, water, etc. (Unity 3D)
 - d. You must use polygonal modeling or convert non –polygonal objects to a polygonal object in order to export from Max to WorldViz Vizard.
 - e. Export your model from 3D Studio Max into Vizard using the OSG/IVE exporter.

2. **Programming:** The VR University should comprise of
 - a. Add *atleast twenty avatars*
 - Utilize keyboard or mouse callbacks to control the movement of the avatars
 - b. Add *a sky with environmental map, add audio file*
(Refer “Using actions example.py”)
 - c. Create *action events (atleast 5) in the environment* [refer animating avatars example.py]
 - comment the code to mention action event1, action event 2, etc.
 - Action events should be on other objects in the environment
(Refer “teacher in a book” for vizard. Refer “animating avatars example.py”)
 - d. Build *simple User Interface (UI) buttons* for interaction: Add slider, button or menu items

3. **Multi-agent System:** 1 **CUSTOM** avatar (such as a student or instructor) and 1 **INBUILT** avatar in vizard to create a multi-agent system.
 - a. Must use a basic bone system and animation (vizard) or Multi-user environment development using photon networking (Unity 3D)
 - b. Add a Player Controller to the Scene. (Unity 3D). Options of other characters to choose for adding player.

The environment needs a player view camera and a controller (that moves by player's control) to enable the player to interact with the game. I recommend the First Person Controller for your first Scene, but you're certainly welcome to experiment with the 3rd Person Controller, if desired.

4. Create an **AI controlled behavior and path finding** for evacuation
 - a. The user needs to press a button on the keyboard to start evacuation
 - b. You can use the AI functionality implemented for bees as mentioned in " teacher in a book" for vizard.
5. Compile the project as a **desktop build or Publish (exe)**

Submit 2 folders on the shared drive

- 1) Complete Project
- 2) Desktop built

References:

Lynda.com

- 1.) Unity 3D Essential Training

<https://www.lynda.com/Unity-tutorials/Welcome/383666/414122-4.html>

<https://www.linkedin.com/learning/unity-3d-essential-training/compiling-a-desktop-build?u=56745537>

- 2) Unity: Interactivity for AEC

- 3) <http://www.cs.bowiestate.edu/sharad/VR2/Unity3d-photon.htm>