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COSC 829

GOAL

To create an interactive 3D representation of a VR evacuation scene in a virtual environment.

- Foster interest in architecture and VR interaction.
  - Begin exploration of a new modality for manipulating VR interaction
  - Demonstrate VR fundamentals through creation of an inviting and relaxing virtual environment
- Practical application:
  - Create visualizations for natural disaster modeling using Unity3D IDE and C# code VS IDE

NEW CONCEPTS

- Additional manipulation of objects
- Ability to select multiple scenarios
- Ability to simulate and represent visually in VR environment

STRETCH GOALS AND FUTURE APPLICATION

- Include avatar representation of multiple users
- Allow multiple users to view the multiple scenarios
- Allow multiple users to manipulate the environment
- Add new software support
  - Photon Unity Networking (PUN) is a Unity package for multiplayer games.

FUTURE APPLICATION:VR MODEL TRAINING

- Interactive guided tutorial on how to build your own emergency models in the 3D environment
- Making the model more interactive and provide visual and haptic feedback when incorrect connections are made
- Include a scoring mechanism on how well a user performed

CONT.D..

- Human factors opportunities for extended studies / future work
  - Create and build multiple natural disasters
  - Measures – attentiveness
  - Duration of game play
 - Initial scence selection

PROJECT DESCRIPTION

- Unity3D Platform
- Multi-user Environment
- Grab and move objects

- Photon Unity Networking (PUN)

VIRTUAL ENVIRONMENT

The VR environment is comprised of two basic scenes, the outdoor recreational scene and the indoor modeling scene.

- Outdoor recreational scene - The virtual environment exists to make a playful, inviting, joyful and relaxing virtual environment and exercise fundamentals of VR development. representation of lights and timers and external avatars are for entertainment and to create an inviting environment for the user.
- Indoor modeling scene – Room to hide and explore from the natural disaster.
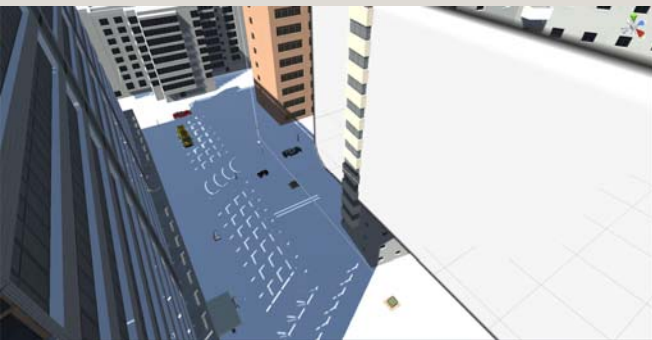
OUTDOOR RECREATIONAL SCENE DESCRIPTION

- A building surrounded by walkway and park area.
- Building that you enter to work on the model
- Outside park area to rest and look around
- City Noise
- Ambulance, Cop Cars
- Proximity sensors for enter and exit building
- May cause some other action of other avatars
- UI: Music on/off
- Interact with other items

INDOOR DATA MODELING SCENE DESCRIPTION

- Enter building for large room to explore data modeling.

- Simple room – area of focus on hiding in center of room
- UI menu for grabbing and moving
- Music

IMPORTANT CODE

- CameraController

- CharacterController

- Pathfinding

PUN CODE

```
public override void OnEnable()

  {

      base.OnEnable();

      PhotonNetwork.AddCallbackTarget(this);

      SceneManager.sceneLoaded += OnSceneFinishedLoading;

  }
```

MORE PUN CODE

```
public override void OnJoinedRoom()

    {

        //sets player data when we join the room

        base.OnJoinedRoom();

        Debug.Log("Has Joined room");

        //photonPlayers = PhotonNetwork.PlayerList;

        //playersInRoom = photonPlayers.Length;

        if (!PhotonNetwork.IsMasterClient)

            return;

        StartGame();


    }
```

```
void StartGame()

    {

        Debug.Log("Loading Level");

        PhotonNetwork.LoadLevel(multiplayerScene);

        // PV = GetComponent<PhotonView>();

        // if (!PhotonNetwork.IsMasterClient)

        //   return;

    }I)

    {        if (target.GetComponent<CharacterController>())

        {          charController = target.GetComponent<CharacterController>();

        }        else

            Debug.LogError("The camera's target needs a character controller.");

        }      else

          Debug.LogError("Your camera needs a target");

    }
```

DEMO

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