COMPUTER GRAPHICS – 2
PROJECT REPORT
SHOOT THE OBJECT - HOLOLENS

December 13, 2017

OVERVIEW

1. Project Description and Goals

- ***HoloLens*** *– This is a device embedded with multiple sensors that can be used in the new generation of mixed reality apps developed using certain tools. In this project, I have designed, built, developed and demonstrated an application that can be used with the HoloLens where you can play a shooting game.*

- *This application can be used in following scenarios:*
    - *Play a shooting game to experience the mixed reality world*
    - *Learn Mixed Reality development using Unity and Visual Studio*

2. Project Scope

- *Deploy the software application, and make it downloadable from the windows store app that will showcase the mixed reality experiences using the Microsoft HoloLens to all the users*

- *More features like multiplayer gaming, share score via social accounts, invite friends to play game could be introduced during next phase of the project*

- *Hold and Place the Application in different location, Move and Resize features can be added*

3. Approach

- ***Tools Used and it's use***

  Unity 2017.2.0f3: Create 3D Model using Universal Windows Platform (UWP), D3D (Direct 3D) and VR support

  Visual Studio 2017 Preview: Create and Edit C# scripts, Windows 10 SDK, x86 Architecture

  HoloLens Emulator 10.0.14393.1358: Deploy and Test the HoloLens application

  HoloLens Device:

- ***Gaze***

  Mouse Cursor Equivalent. Look at the objects using head movement

- ***Gesture***

  Mouse button equivalent. User can shoot the ball on to the objects (cubes) using tap gesture

- ***Spatial Mapping***

  HoloLens does the mapping by itself in any room and the API's are provided by Unity and UWP

- ***Voice Commands***

  Implemented voice commands to reset the blocks after shooting the objects

- ***Spatial Audio***

  Implemented Spatial audio feature as you shoot a ball on to the objects

- ***Performance Testing***

  I carried out a performance testing on the application I built using the windows device portal and verified that there're no memory leak and the application is running fine

4. Alternative Approach

- *This app could have been built on the **VR technology** using devices like Oculus Rift. I chose building the app on **Microsoft HoloLens** that uses **AR technology** as it provides better user interaction with the application by using gesture features. Building an application on HoloLens also makes it look more real as it interacts with the real-world objects. One of the reason for building the app using the HoloLens device is because I like to improve my skills in .NET development as I used C# as my programming language to build this application*

5. User Manual

- *User Manual for this project consists of the following steps:*

  1. *Download Link for the Source Code*
  2. *Software's required to run the application*
  3. *Setting up the application for deployment*
  4. *How to use the application?*

- ***Link to User Manual & Source Code***

  https://github.com/kcshettar/cg2f2017/tree/master/Project/Source%20Code

6. References

- *https://developer.microsoft.com/en-us/windows/mixed-reality/development*
- *https://developer.microsoft.com/en-us/windows/mixed-reality/unity_development_overview*
- *https://developer.microsoft.com/en-us/windows/mixed-reality/performance_recommendations_for_hololens_apps*

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