computer graphics – 2

project report  
Shoot the object - hololens

December 13, 2017

# Overview

## Project Description and Goals

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|  | **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 |

## Project Scope

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|  | 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 |

## Approach

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|  | **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 |

## Alternative Approach

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|  | 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 |

## User Manual

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|  | 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> |

## References

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|  | <https://developer.microsoft.com/en-us/windows/mixed-reality/unity_development_overview> |
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|  | <https://www.microsoft.com/en-us/hololens/developers> |
|  | <https://www.youtube.com/watch?v=907BGdJxJuw> |
|  | <http://mashable.com/2015/05/01/how-to-develop-for-microsoft-hololens/#gRPiJ.Ov4gqG> |
|  | <https://www.sitepoint.com/getting-started-with-microsoft-hololens-development/> |
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