

Mobile Remote Control - Proposal Brief

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Complex Game Systems

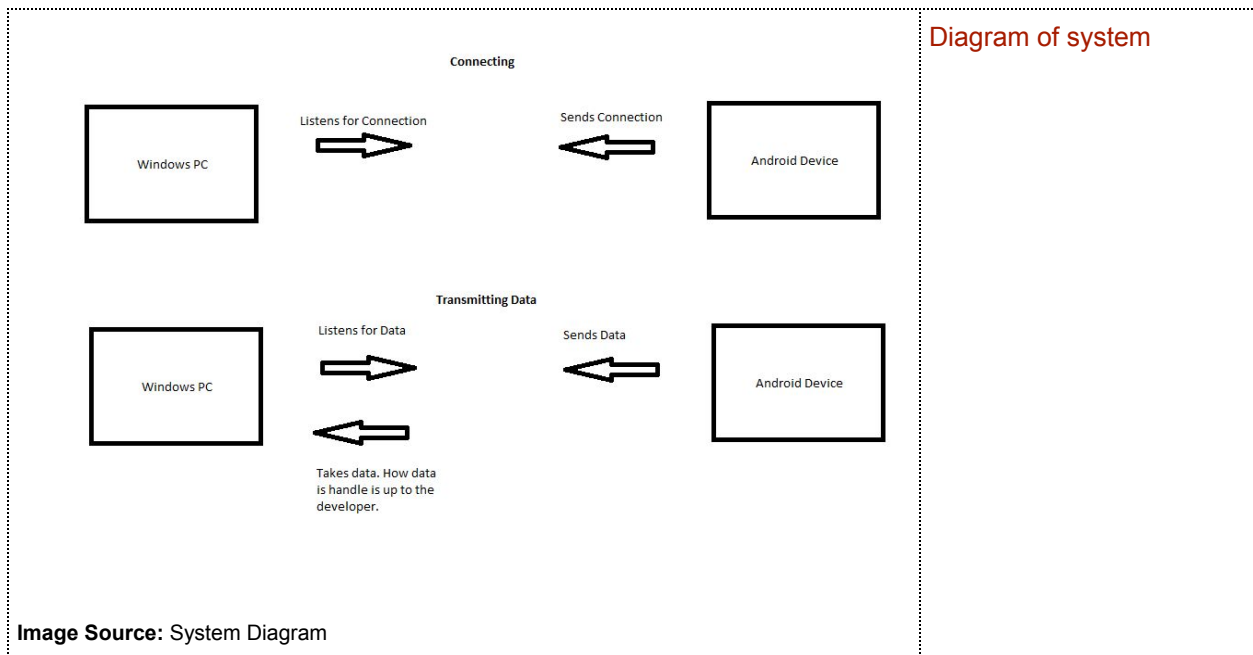
Overview

I will be developing a plugin for Unreal Engine 4 where a smartphone device can be used as the controller and the screen for the game.

This project will consist of three components:

- The game on Windows
- A mobile app that calls events in the game
- A plugin that enables networking

The mobile device will run an app that connects to the game on the computer via a wifi network so that it can send data that call events in the game.



Target Platform and Audience

The current targeted platforms are Windows 7/10 computers and Android smartphone devices. The plugin will give developers a head start in networking so the plugin doesn't have to be used in the same way as this project.

Core Features

- Feature: Network Connection

The plugin enables networking through a TCP/IP connection. In the demo project the user will use their local network to connect the app on their android device to the game on their windows pc.

Similar Projects and Inspiration

Thread on Android Phone as controller

<https://forums.unrealengine.com/showthread.php?64462-Phone-as-Controller>

Thread on Android motion sensor

<https://forums.unrealengine.com/showthread.php?99156-WIP-Android-phone-as-motion-sensor>

Python TCP Socket Tutorial

https://wiki.unrealengine.com/TCP_Socket_Listener_Receive_Binary_Data_From_an_IP/Port_Into_UE4._%28Full_Code_Sample%29

Similar Project 1: UE4 Plugin

This is a plugin for UE4 that lets the player use their smartphone as a controller and also screen shares the game to the phone. It was intended to assist in the development of games to “Play the game from your mobile device without waiting long package time or launch-on”. Nothing is noted about how the plugin works however it could be assumed that the developer used the inbuilt networking inside Unreal 4.

<https://www.unrealengine.com/marketplace/remote-control-android-and-ios>

What technologies does the project use?

- Unreal Engine 4

Similar Project 2: Space Lamb

Space Lamb is a browser game that uses motion detected from smartphones to control the main character. It uses WebRTC to connect the game to an android or IOS device so that the game can be controlled remotely.

<https://spacelamb.12wave.com/>

What technologies does the project use?

- WebRTC
- WebGL

Similar Project 3: VRidge

VRidge is a commercial program that allows PC VR games to be played on mobile VR headsets. It also features a game library to manage the users games.

<https://riftcat.com/>

What technologies does the project use?

- OpenVR?

Research Support Technology / Tools / Algorithms

- Mobile development
 - Android Studio
 - IDE for Android development
 - <https://developer.android.com/studio/index.html>
 - Android SDK for Visual Studio
 - <https://docs.elementcompiler.com/VisualStudio/Setup/AndroidSDK/>
 - Needs Java JDK and Android SDK
 - Cross platform
 - <https://msdn.microsoft.com/en-us/library/dn707591.aspx>
 - CodeWorks for Android
 - Nvidia product
 - Installs everything needed for android development in UE4
- Network API
 - UE4 Networking
 - UE4 has multiplayer built into the engine so a custom server doesn't need to be built unless the developer wants to
 - Winsock
 - Windows
 - Socket
 - Linux
 - Raknet
 - Cross Platform
 - C++ networking engine
 - <http://www.jenkinssoftware.com/>

- POCO
 - Cross platform
 - C++ class libraries
 - <https://pocoproject.org>
- ICE
 - Cross platform
 - C++ networking engine
 - <https://zeroc.com/products/ice>
- Screen sharing
 - RTP streaming Protocol
 - <http://stackoverflow.com/questions/555831/what-is-the-best-way-to-develop-a-screensharing-presenting-app-in-java-or-c-us>
 - <http://www.live555.com/> - Internet Streaming Media, Wireless, and Multicast
 - <http://ffmpeg.org/> - A complete, cross-platform solution to record, convert and stream audio and video.
 - TightVNC
 - <http://www.tightvnc.com/>
- VR
 - OpenVR
 - "...API and runtime that allows access to VR hardware from multiple vendors without requiring that applications have specific knowledge of the hardware they are targeting."
 - From ValveSoftware
 - <https://github.com/ValveSoftware/openvr>
 - Project that uses OpenVR
 - https://www.reddit.com/r/SteamVR/comments/4ckbf4/openvr_api_android/
 - Forwards sensor data from an android device to a steamvr driver
 - OSVR
 - An SDK to allow developers to support all VR hardware in a "single go"
 - <http://www.osvr.org/what-is-osvr.html>

Required Technologies / Tools / Algorithms

- Unreal Engine 4
 - Unreal 4 has everything built in needed for this project:
 - Support for mobile devices
 - Networking
- Nvidia codeworks

- Installs everything needed for android development in UE4

Class Schedule and Development Timeframe

- 2 Weeks: Research and Proposal development
- 4 Weeks: Implement and develop (including game jam and term break)
- 2 Weeks: Project Review and Submit

20/03/2017	Week 1: Thu- Fri	Project Brainstorming and Research (groups)
27/03/2017	Week 2: Wed - Thu - Fri	Project Proposal and Brief developed reviewed and approved. (groups)
03/04/2017	Week 3: Thu - Fri	Project development
10/04/2017	Week 4: Game Jam Week	Stepping away from the assessment during class, you will be developing a game with the art and design students.
17/04/2017	Week 5: Term 1 Break	No Class: Project development at home
24/04/2017	Week 6:	Project development
01/05/2017	Week 7:	Thursday: Assessment Review
08/05/2017	Week 8:	Thursday: Final Submit Friday: Project presentation

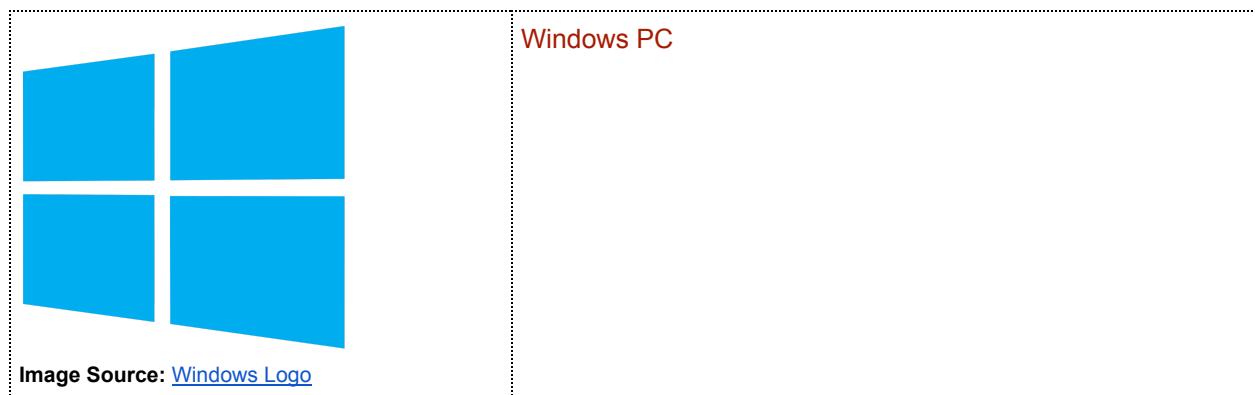
Time Frame justification

Time inside and outside of class will be used to develop the project. A python script will be used to test the networking of the game before the android app begins development. This is so the game can be in a working state before the android app needs to be tested.

No multithreading will be implemented in the project as there won't be enough time to learn how to implement that in UE4 alongside UE4 networking.

Detailed Project Outline

Outline how your intended audience will interact with the system, use diagrams, images and mock user interface layouts to describe the intended flow.



The plugin will set up a network system for communication between a computer and android device.

The Game will be really simple and will take inputs from the android device which will be transmitted through a TCP socket connection. The Android will run a game that just sends data to the game over the network.

Android Device



Image Source: [Android Logo](#)

The mobile app will be basic. It will have a screen for inputting the ip address of the computer on the local network and will send ints as inputs for the game to handle.



Image Source: [Network Connection Icon](#)

Server

The plugin will allow the game to take a TCP connection and stores the received data in an array so that the game can use the data in a structured way.