Trialogue

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Platform:

Physical Installation running on a PC/MacOSX desktop (Player) as well as two iOS devices (iPhone 5S and iPad 2) and a MIDI controller on the Developer Side. Oculus Rift and Arduino based sensors on the Character Side.

Technology Used

Game Engine

Unity3D

Summary

Unity is a game development ecosystem: a powerful rendering engine fully integrated with a complete set of intuitive tools and rapid workflows to create interactive 3D and 2D content; easy multiplatform publishing; thousands of quality, ready-made assets in the Asset Store and a knowledge-sharing community. Unity is a game development ecosystem: a powerful rendering engine fully integrated with a complete set of intuitive tools and rapid workflows to create interactive 3D and 2D content; easy multiplatform publishing; thousands of quality, ready-made assets in the Asset Store and a knowledge-sharing community.

Features

- Based on .NET/Mono Framework
- Cross-Platform
- 2D Graphics and Animation System
- 2D GUI System
- 3D Audio System with Filters
- Editor Plugin Programming Support
- Cg Shader Programming Support
- Network Socket Support
- Oculus SDK Support

Cost
$0 for Personal License
Support

Has a large and active community with detailed official documentation as well as unofficial tutorials. Many supplementary open-source libraries and packages which can be used to extend existing functionalities.

Possible Issues:
Editor plugin programming API is not fully documented.
Harder to draw primitive shapes by code in the game.

Alternatives:
Unreal3D, Crytek Engine, Source

Visual Programming Engine

Max/MSP/Jitter

Summary
A visual programming tool for modulating audio/video data as well as information directly from the GPU. It can also alter logic based on MIDI and OSC data which allows users to dynamically compose music with its Max for Live plugin.

Features

- Extensive library to modulate audio and video data dynamically
- Takes a variety of inputs including OSC and MIDI
- Offers a variety of inter-application mediations

Support
Has a detailed official documentation and a large archive of free libraries for MSP and Jitter (the audio and video components of Max respectively). Many professors within NYU Tisch and NYU Poly work closely with Max/MSP/Jitter, so seeking any troubleshooting advice should be possible.

Cost
$9.99/per month subscription

Possible Issues:

- Has performance issues if the patch being run has multiple library dependencies
- Some of the libraries support may be deprecated

Alternatives:
Isadora, Pure Data

Virtual Reality SDK

Oculus Rift SDK

Summary

As part of the Character Hub, I will be using a virtual reality interface as an experience interface at one of the three vertices of *Trialogue*. Oculus Rift SDK currently offers the most matured development and thus the most community support.

<u>Features</u>
- Direct integration with Unity3D
- Has a distance tracker enabling VR zoom

<u>Support</u>
Has documentation on their site as well as an active community.

<u>Possible Issues</u>
- Windows only.
- Doesn't quite work on Windows 10 yet.
- Takes time to setup on a new computer

<u>Cost</u>
Game Center has many devices already

Physical Sensor
jit.gl.freenect

<u>Summary</u>
The free OSX library which allows Kinect Model 1414 to operate within Max/MSP/Jitter. This allows me to get depth and RGB data from the movement of bodies around the installation space.

<u>Features</u>
- Easy integration of Kinect into the application
- Allows for variety of manipulation of depth and RGB image data

<u>Possible Issues</u>
- Not supported on Windows
- Libraries often may have dependency errors when installed on new machines

<u>Cost</u>
Free

<u>Alternatives</u>
Windows Kinect Library, Microsoft Kinect SDK

Arduino Control
Processing + Firmata

<u>Summary</u>
In order to facilitate the Character's "body" with sensors, simple Arduino sensors will be used in conjunction with Processing running on Firmata firmware.

<u>Features</u>
- Allows for DIY manufacturing methodology
- Easy to implement
- Low cost
- Wi-Fi enabled

<u>Support</u>
Documentation on the official site as well as on Processing. In addition, plenty of examples and video tutorials available on blogs and YouTube.

<u>Possible Issues</u>
- Prone to damage
- Can stop working due to the DIY nature of it during long-term installations

<u>Cost</u>
$22 onwards for an Arduino kit

<u>GPU Plugin</u>
Syphon

<u>Summary</u>
In order to facilitate direct graphical manipulation at the hands of the Developer to alter the experiences of the Player and Character, Syphon will be used as the plugin which will allow Unity3D application to communicate with Jitter component of Max/MSP/Jitter.

<u>Features:</u>
- Open source
- Has numerous plugins for applications including Unity3D and Max/MSP
- Allows to share rendered content and video enabling easy compositing
- Hardware acceleration on the GPU where it shares the content on card allowing smoother FPS across applications

<u>Support</u>
Basic support and documentation. Each plugin has extensive set-up and functionality documentation.

<u>Cost</u>
Free

- Plugin for Unity3D is for Version 4 but works fine with 5.0+ thus far
- Max/MSP support is limited to Jitter

Animation and 3D Modelling Tool

Autodesk Maya

Summary
For developing 3D models, rigs and animations, I will be using Maya as it has some of the most extensive tools for creating them.

Features

- Exports in FBX which is compatible with Unity3D
- Has inbuilt tools for texturing and painting
- Combines the modelling, rigging and animation workflow into one

Support
Detailed documentation and tutorials, both official and unofficial including on Lynda

Cost
Free with Student ID

Possible Issues

- Prone to crashes and performance issues

Alternatives
SketchUp, Blender

Image and Video Editing

Adobe Creative Cloud

Summary
Set of applications containing one of the most popular image editing tools – Photoshop which I'll be using for creating in-game 3D textures for the game as well as 2D promotional and marketing materials. In addition, I'll be using Premiere Pro for editing any recorded video for documentation as well as any potential machinima work that might be incorporated into the project.

Features:

- Rich and diverse set of features for each program

- Variety of export options

<u>Support</u>
Large set of online video tutorials and unofficial guides

<u>Cost</u>
Part of our Adobe CC license

<u>Alternatives</u>
GIMP, InkScape (for Photoshop), Final Cut Pro, Movie Maker (for Premiere Pro)

OSC Interface
TouchOSC

Summary
An iOS application which serves as the foundation for OSC communication between the iOS devices it's installed on (and being operated by the Developer) and the desktop computer running the Unity3D application which the Player is using.

Features
- Cross-platform
- Has a robust Editor tool for modifying interface

Support
Has detailed setup guides and documentation on its OSC components on their official site.

Cost
$4.99

Possible Issues
- API isn't open-sourced beyond Editor
- Relies on the network strength and reliability

Alternatives
Using the native OSC library

Live Programming
chucK

Summary
Enables "on-the-fly" programming and compiling allowing for immediate change of audio by user input. Will be used on the Developer end with additional interface built upon it which will abstract code into a format that is human-readable. In addition, its existing modules will allow for real-time music synthesis from the Developer's end to change the experience of the Player and the Character.

Features
- Dynamic compiling
- Real-time music synthesis
- Supports MIDI and OSC

Support
Official documentation and a few unofficial tutorials. Most of the research and use has been within the live coding community and academia.

Cost

Free

<u>Alternative</u>
Max for Live

Audio Production/Mixing/Mastering
Ableton Live

<u>Summary</u>
One of the more popular professional audio production tools, Ableton Live comes with a diverse set of tools as well as sophisticated VST plugins and large set of potential inputs. It also comes with a large collection of royalty-free samples. In addition, Max for Live plugin offers a direct connection with Max/MSP/Jitter and Ableton.

<u>Features</u>
- Diverse set of tools for production, mixing, layering and mastering
- Max for Live allows for audio modulation and dynamic composition through Max/MSP/Jitter
- Large set of samples allows for an easy start

<u>Support</u>
Detailed documentation and tutorials, both official and unofficial including on Lynda

<u>Possible Issues</u>
- Performance intensive
- Cluttered interface makes it difficult to do simpler things

<u>Cost</u>
Free trial for a limited period and then $349 (for Standard) and $749.99 (for Suite which contains the Max for Live module) to purchase the license.

<u>Alternatives</u>
FL Studio, GarageBand, Magix Music Maker