Unity Optics
Documentation

Team Unity
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1 Product Description

Unity Optics is an 3D-Based advertisement tool for video games developed in the Unity Game Engine. With this tool, we intend to enable developers to record the telemetry of players' interactions with advertisements in-game. Furthermore, Unity Optics provides the collected data in multiple formats in order to allow clients who wish to analyze the data may do so with the proper format for their purposes.

2 Program Functionality

Unity Optics allows for multiple interactions and measurements to be tracked regarding how a player sees and interacts with an advertisement. Currently, the functionality includes: measuring time spent with the advertisement on-screen, measuring the distance from the advertisement, measuring the angle from the center cross-hair of the screen to the ad, and more physical iteractions such as picking up, throwing, and reading the advertisement.

Each of these measurements or interactions are tracked and written to JSON objects and files that are later stored in two data stores: Firebase Realtime Database and Firebase Storage. Both of these offer a different form of accessing the data. Firebase Realtime Database can provide individual JSON objects to clients that have no need for the entirety of the collected

data. On the other hand, Firebase Storage stores the data as "documents"; hence, a client may download entire JSON files iwth all the collected data.

3 Intalling Modules

Necessary modules for this project include: Unity3D, Microsoft Visual Studio IDE, Firebase SDK for Realtime Database and Storage, and Git. Please view the Installation Guide for further direction to install and manage these necessary modules.

4 Setup and Usage

Once the modules are installed, it is easy to get Unity Optics running for your advertisements in your game. We developed this as a plugin that is attachable to any Unity Object. As long as your advertisements fit the criteria of being part of the Unity Object class, you can simply drag the plugin file adbehaviorscript.cs onto the object. That's all! Now, whichever object is equipped with the plugin will contain the current pre-programmed interactions and record this data to Firebase.

5 Firebase API

In order to access the Firebase API, you will need to authenticate yourself on the UnityOptics firebase console. This can be done a number of ways: contact the owner to request permission, go through the REST authentication API for Realtime Database (https://firebase.google.com/docs/database), or integrate the storage API to access UnityOptics firebase once you are authenticated via contacting the owner (https://firebase.google.com/docs/storage)

6 Known Issues

The most glaring issue that pervades the work so far is its limitations to iOS and Android builds. The initial intention was for this to be a web-based showcase of data being shown as you play through the game in a browser. However, Firebase is limited to only iOS and Android builds in the Unity

Editor. This limitation is partially overcame by the provided REST API for Realtime Database and the API for Firebase Storage, so setting up a web-based analytics tool is still viable.

We include further explanation of less glaring known issues in our "Working Prototype Known Problems" document.