Research Findings: Vuforia & Data Deployment

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1. Background

Luminary has been building AR applications using Unity and the Vuforia plugin for target identification and displaying content. We need to find out how Vuforia works and deploys data and any alternatives.

2. Objectives

Look in to the Vuforia plugin, what it does, how it works with Unity, how data is deployed and any alternatives of it.

3. Approach

Use search engines to find relevant data, forums, official site, videos.

4. Findings

- 4.1. I tried using the Vuforia plugin with Unity to get a hands-on experience but ran in to problems right away.
 - 4.1.1. The version of Vuforia (5) that I had downloaded did not work with the 64-bit version of Unity that I had. I downloaded the 32-bit version of Unity and it worked fine.
- 4.2. Following a little tutorial on YouTube, I was able to create a basic AR application that scanned a marker (that I had created) and displayed a model that I had downloaded from the asset store.
 - 4.2.1. The marker that I created was easily created using the online tools on the Vuforia Developer Portal. I just had to upload an image (something that has greater detail, easily identifiable features is better) and the portal would convert the image to a format that can be read by Unity/Vuforia. The image can then be scanned by the device's camera and display/do whatever is programmed.
 - 4.2.2. To be able to use the Vuforia plugin, a license key that can be found in the developer portal needs to be added in to Unity before deployment.
- 4.3. Vuforia handles the detection of markers, tracking and augmentation of 3D models within an image database, it does not do anything in regards to using GPS features or use of geolocation services.
 - 4.3.1. Some AR SDKs that can do this are: ARLAB, BEYONDAR, DRIODAR, METAIO, WIKITUDE.
- 4.4. Dataset files (.dat and .xml files) hold the AR target information.
 - 4.4.1. These files can be stored on a server like any other type of file on a server. Organisation of these files is up to the server administrator.
 - 4.4.2. To use the dataset files the files need to be downloaded from the server to the devices storage.

- 4.4.2.1. This can be done using an HttpURLConnection pointing to the URL of the server.
- 4.4.3. Once the dataset files have been saved to the devices storage, the dataset files can be loaded using Dataset.load() method with the STORAGE_ABSOLUTE parameter.
- 4.4.4. Dataset files **MUST** be located on the devices storage to be used, therefore they must be downloaded beforehand. The content cannot be streamed to the device when needed.

5. Further Investigation

- 5.1. Might be a good idea to look in to the other AR SDKs, though a quick look through shows that most of them are not free and need a paid license to be used.
- 5.2. Vuforia is easily used and handles pretty much everything we need it to.

6. Recommendations

- 6.1. Using Vuforia would probably be the best option for us. It seems to have the most documentation on it. There is a forum with lots of tutorials and others asking questions that are relevant to our use, so finding help should be easy.
- 6.2. Become familiar with using Vuforia, create more prototype applications using it.
- 6.3. Try to get a server, download a target marker and use it in a created application.

7. References

Developer.vuforia.com,. (2015). *Cloud Hosting* | *Vuforia Developer Portal*. Retrieved 3 August 2015, from https://developer.vuforia.com/forum/android/cloud-hosting

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