Research Findings: Vuforia

Date 13 March 2015 Researcher Sean Young

1. Background

The Client at Luminary Promotions has stated that Vuforia is one of the main software development kits for building augmented reality applications and will help us to develop the augmented reality application the client wants.

2. Objectives

Research what Vuforia is and how it plays a role in augmented reality application development.

3. Approach

Internet research.

4. Findings

- 4.1. What is Vuforia?
 - 4.1.1. Vuforia is a software development kit developed by a company named Qualcomm that uses mobile systems to create augmented reality applications.
 - 4.1.2. Key features include the ability to recognise and track images, objects, text, markers and reconstruct environments. Vuforia works by utilising a mobile camera to recognise and track flat images and simple 3D objects in real time. This means a developer is able to add virtual objects to a real world scene or real world object.
 - 4.1.3. The virtual image processing is able to track objects in the real world scene and this gives the viewer a perspective that the object is physically there in the real world scene. Viewers can view the virtual object they have placed through a devices mobile camera.
 - 4.1.4. Below is an example of a virtual teapot on top of a real world image of stones printed on a piece of paper if you were to move around and view different angles of the paper the virtual teapot will orient itself in relation to how it was placed.



- 4.2. Platform Components: There are 3 core components to the Vuforia platform
 - 4.2.1. The Vuforia Engine This is a client side library that supports Android and IOS. Unity, Xcode and Eclipse can be used with the Vuforia platform to build applications.
 - 4.2.2. Tools Vuforia has a variety of tools which aid developers when developing augmented reality applications such as the <u>Target Manager</u>, a web app on the developer portal that allows you to create databases of targets for use on the device and the cloud if a large amount of targets are to be stored.
 - 4.2.3. Cloud Recognition Services This service offers your application the ability to recognise a large amount of target images stored in the databases or if you application regularly updates to the database. Other related services such as the Vuforia web service API allows developers to manage the databases and update content within the database efficiently. This means that applications are less bloated when installed on a mobile devices as the image data is stored on the cloud.
- 4.3. Vuforia and Unity The Vuforia Extension can be used in Unity, a game development platform. This allows developers to create augmented reality apps easily by using the unity game engine

5. Further Investigation

5.1. Vuforia Object Scanner is an application for Android that enables an Android device to scan a physical 3d object using the devices camera. Once scanned the application creates an Object Data file which can be tested and edited. This provides visualisation of the object's features and coverage given in an environment. This can be used to understand what a virtual image marker may look like near physical 3d object. Example of Object Scanner testing https://www.youtube.com/watch?v=t69YxEP7Yfg

6. Recommendations

6.1. Through my findings I have seen that Vuforia is a very powerful development kit that contains a variety of tools to help the project team develop the product. Vuforias components such as cloud services will be of great use as we will be able to store large amounts of content in the databases such as images which will help develop a more compact application that won't take up too much space on a mobile device. Also Vuforia is an extension of Unity which is the platform the client has recommended for us to use for development as it is not too hard to interact with and supports iOS and Android devices. I recommend that we should include Vuforia into the project development based on my findings.

7. References

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