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CSCI 5920

Final Project Proposal

**Introduction**

Detector is an Augmented-Reality(AR) game that allows users to play good old-fashioned hide and seek. The purpose of this game is to allow users to experience a new spin on an old game.

**Description**

Hide and seek is one of those games that we all loved as a child. As we grow older we grow more and more nostalgic for those things we knew fondly as a child. That is why we have developed Detector, a new take on the game we all know and love. As you play the game your surroundings will become more and more immersive, allowing you to find all sorts of real, and imaginary, to hide behind. The best part about Detector is that it doesn't require the ability to actually have objects to hide behind. You and your friends can create immersive AR worlds full of hideable objects in the middle of a park, desert, or even the local shopping mall. The sky is really the limit to the world that you can create and Detector promises to bring fun for the whole family.

**Key Features**

* Ability to bring objects to life in any environment
* Turn many everyday objects into great hiding spots from your competitors
* Fill any space with life-like objects to use to hide from friends and foes
* Multiplayer support - Play with friends or family through online servers

**Genre**

Stealth/MMO/AR Game

**Platform**

Mobile

**Marketing Analysis**

Target Market: The target market for this game will be between 4-80 years old. AR Hide & Seek is a game with a very similar description to Detector and it currently is labeled as fun for all ages. Detector hopes to target a similar market. Detector is hoping to target families and other friendly gatherings where people are looking to play together in an immersive environment. Currently AR Hide & Seek has a 4.3 rating on the Apple App Store and has over 20 favorable reviews. Currently the differences between AR Hide & Seek and Detector are the following:

* Multiplayer support - Currently AR Hide & Seek is single player and is not meant for consumption by more than one person. Detector on the other hand is made specifically for Multiplayer support.
* Range of hideable objects - The number of objects that you can hide behind in AR Hide & Seek are those objects that have been created in game. This is different from Detector, which allows you to hide behind a combination of real and imaginary objects.

**Technical Analysis**

Experimental Analysis: The main experimental feature that will be added to this game is advanced occlusion in a multiplayer environment. While certain games, such as AR Hide & Seek, currently offer occlusion features in an AR environment, none do so in a multiplayer environment. The difficulty arises in perspective, where one person may see the object in front of another object if they are on one side of the object and another person may see the object behind another object if they are on the other side of the object. The technical difficulty in achieving this feature is as of yet unknown, however a naive approach, that may prove to be very successful, would be to implement occlusion in real-time, so as to avoid perspective problems.

Major Development Tasks

* Initial game development: One developer 2-3 weeks
* Creation of hideable objects: One developer 1 month
* Occlusion of people/digital object: One developer 1-2 months

Risks: The largest risk in this game is going to be the multiplayer support. The team has never developed a game with multiplayer support and it may be beyond the capabilities of the development team in such a short period of time. If it becomes too much of a hindrance, the plan will be to change it to a single-player game where you play against digital opponents instead of real opponents.

Estimated Resources

* Mac computer
* Apple Development Kit
* Apple AR Kit
* Unreal Engine 4
* 3DS Max

Estimated Schedule

* Start on 10/05/2019
* Milestone 1 - Finish the initial game setup and run it on a real iPhone (10/14/2019)
* Milestone 2 - Finish designing and building initial hideable objects (10/23/2019)
* Milestone 3 - Multiplayer support done (11/07/2019)
* Milestone 4 - Minimum viable product complete (11/14/2019)
* Milestone 5 - Final testing and documentation done (11/21/2019)

**Research Component**

This game will heavily rely on two specific AR features. The first is AR occlusion, which will mostly come from using Apple’s new ARKit 3. ARkit 3 offers People occlusion detection and People tracking that will allow us to, with some effort, hide people behind various digital objects. In doing this, we will need to turn real objects into digital objects using AR interactions. Luckily ARKit3 offers the ability to do this on a wide-variety of objects. The goal will be to isolate a set of known everyday objects that will need to be tested to ensure they do turn into digital references, for example, sofas, tvs, doors, cars etc,.

