

COMP4801

Final Year Project



Augmented Reality in Retail

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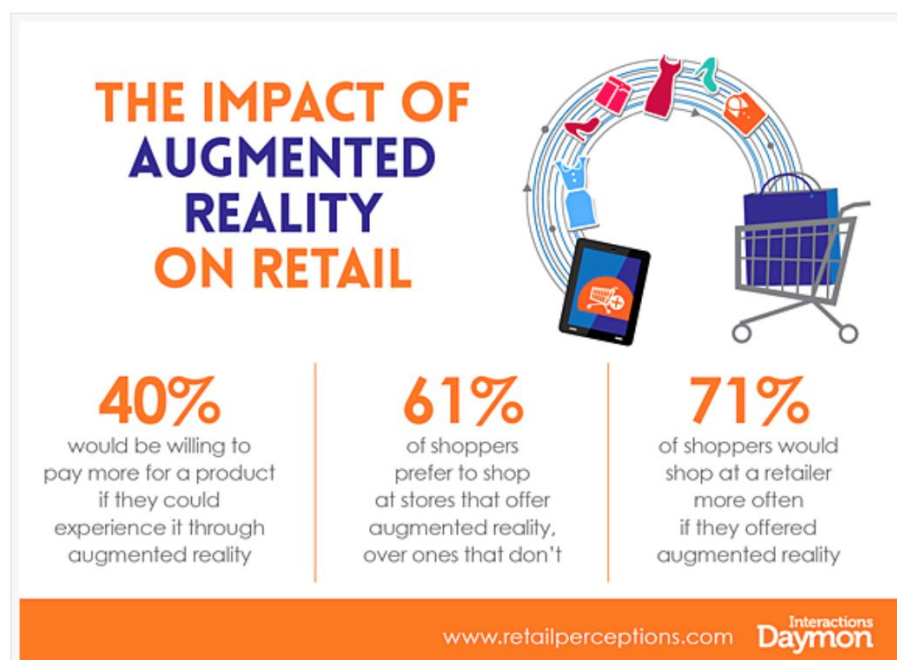
Detailed Project Plan

Project Background

Ever since the advent of Pokemon Go, Augmented reality has garnered the attention of various tech enthusiasts. Augmented reality is best described as a technology which “superimposes a computer generated image on the user’s view of the real world”.

Having a personal interest in this rather new but blooming technology, we decided to tap into it and look into its application in today’s retail set up.

Today, several retail giants like IKEA, Shopify, Topshop, Sephora, Dulux Paints etc. have tried to implement AR in their online shopping environment which have gained public acceptance and enthusiasm. However, these AR applications are still at their infancy and can be enhanced much further to be able to advance the retail environment. Figure 1 shows some statistics for the same-



[1]

Hong Kong- A city with limited space but unlimited potential and opportunity! Being one of the world’s most advanced global cities, Hong Kong’s retail market is divided mainly into two- Online stores and offline stores. Online stores have a low set up cost but do not offer a very intuitive experience. Offline stores on the other hand have high infrastructure and set up cost owing to the high rentals in Hong Kong. Offline stores have limited choice in products due to limited physical space, while online stores lack

the physical representation of the product despite a greater range of choice. When the customer shops, his online experience is much different from the offline experience, even if shopping for the same item. We want this shopping experience to be seamless such that the user doesn't have to switch between viewing objects on a website and viewing objects in reality.

Our project idea is themed around creating a new, intuitive shopping experience wherein a person can see and feel the products in the virtual shop with limitless inventory and minimal setup costs.

Our application will transform the user's camera view into an augmented world of a global city landscape, thereby connecting the user to various shop model objects and creating an all new at home shopping experience like no other by bringing to them an experience of a global city.

Project Objectives

- To research and select an AR software which can be used to design navigable cityscapes; help in tabletop detection and its transformation into the preferred cityscape. (Cityscape Mode)
- To design a seamless navigable landscape such that the user can walk around just like he/she would in a street market.
- To create detailed floor plans in various buildings of the landscape and render them in three dimension. (In Store Mode)
- To build infrastructure for the AR shops and mapping them to the respective building floors.
- To design the AR products that would be sold in the respective shops.
- To create and maintain a database of all the AR objects that would be sold in these shops.
- Create a user interface which enables user interaction with the product all the way through actually purchasing the product.

Project Methodology

1. To build the AR application, we would be using Unity as our development software. Due to its advanced physics engine and rendering capabilities, it is the perfect choice for building a dynamic Augmented Reality experience. Along with that we would be using the Apple ARKit 2 as it has extensive documentation and features like visual

inertial odometry and multiuser support.

Cityscape Mode

2. We'll be using Blender to create the environment renderings and use ARWorldTrackingConfiguration class in ARKit to place these renderings into the physical environment.

We would be working on creating and coding interaction mechanisms between the user and the cityscape using the UIKit Gestures library. This would involve designing algorithms for camera movement, building selection, general navigation and point of interest curation.

In Store Mode

3. We will be using Rhino to create the floor plans for the shops that we would be designing. The ARSCNView Class detects Planes and adds them as anchor points for the objects, we would be creating algorithms to differentiate between horizontal and vertical planes to build the shopfront with respect to its surroundings.
4. We will use Blender to create the 3D objects to be sold inside the stores, these would be demo products like watches, furniture and cars, and would mostly involve importing free samples from the internet and modifying them.
5. We will be using components basic SceneKit components used in iOS apps along with the UIGesture Kit to create shopping interactions for product selection, viewing and purchase the product.
6. To store the objects and other assets we would be using Amazon Web Services, such that a cloud based scalable solution is possible in the future.

Integration

After the cityscape mode and the in store mode are complete, we would be focussing on creating interactions for integration. This would involve creating entry and exit logics for the stores along with creating anchor points to switch between the two views.

We would be developing Multiuser experiences using the MultipeerConnectivity framework such that shared shopping experiences are possible.

We will be developing specifically for Apple products and would be testing out the product on ARKit compatible devices. While both ARCore(Android) and ARKit(iOS) SDKs are subtle, and provide similar functionalities, the ARkit 2.0 brings an added angle of shared experiences using social AR which makes it application to our project

to span a broader range.

Project Schedule and Milestones

Phase 1

September-October, 2018.

Research and AR software survey

We would start by experimenting and researching on ARKit and other available AR technologies and their application. We would also be studying urban landscape to build navigable cityscapes for the purpose of our project.

Phase 2

November-December, 2018

Shop Creation and Design

We would be designing the interiors of the shops with their respective products.

Phase 3

January-February, 2019

Cityscape Creation

We would be designing and testing out preliminary cityscape sections.

Phase 4

March, 2019

Integration and Deployment

We would be focussing on integrating the two parts of the project to create a seamless experience. We would also move the assets and scenes to the cloud for scalable deployment.

Phase 5

April, 2019

Unit Testing

Final testing and deployment of AR application on various iOS devices.