



UOB-IEASMA-151: Augmented Reality Application for Newspapers

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Abstract

Augmented reality (AR) is making a buzz in the technological department lately. It involves artificial overlaying of computer graphics on to the real world. AR is sometimes also referred to as Mixed Reality, which generally means a multiple axis spectrum of areas that cover the Virtual Reality (VR), telepresence, AR and other such technologies.

Augmented Reality can prove to be an interesting feature in the newspaper which would take the readers over and beyond the inked pages. It would enable the readers to get a complete immersion into the news article with the help of animation, video or some other unexpected content. The content is already present on the page but is not visible until required. Augmented reality program and the camera sensor of the smart phone need to work together for the illusion to be created. The newspaper will have to be viewed through the camera sensor of the smart phone for the illusion to work in a proper manner. Further, the smart phone should have a working internet connection.

Keywords: Augmented Reality, ARKit, Xcode, Virtual Reality, Mixed Reality

Introduction

AR is a technology that amalgamates virtual information onto the real surrounding. It includes the use of multimedia, 3D modelling sensing, intelligent interaction, real time tracking and response system and much more (Aggarwal & Singhal, 2019). The basic principle is to put in computer generated information, which is virtual, such as 3d images, text, videos, movies to the real surroundings after creating a simulation. The different information and data complement each other and, in the process, achieve and enhanced real world.

In this research paper, we are implementing an app in which we will be having an interactive newspaper with interactive images. The newspapers will contain live images that will add extra detail and colour to live and adapt. We will be using latest feature of ARKit to turn our newspaper into a magical newspaper that will play the content that is relevant to the image that is being detected (Apple Inc, 2020). It will turn a boring and standard newspaper into something that is extremely interesting and it revamps the experience of reading newspaper (Crampton, 2021).

Problem Statement

Interactive learning allows the user to participate and interact with in the learning environment. However, due to the enhancement of learning environment, the conventional way of learning does not satisfy the people and the learning activity started to feel bored and nostalgic. It is because the

interaction between the learning tools and the user is limited to static stuffs such as text. It seems hard for students to visualize and they will fail to focus. On the task in hand. Augmented Reality is a term for a live direct or an indirect view of a physical, real-world environment. Learning using Augmented Reality enhances the view and experience of learning as well as the learner. The learning interactive application using Augmented Reality concept will add in multimedia elements such as pictures, graphics, sounds, animations, etc. It is used to enrich the learning environment and to let the users get fully involved in the learning activity. The augmented reality systems works in a manner that when the user moves around, he can see the virtual objects and the animations being projected around him.

Scope of the study

The scopes of this study are as follows:

- i. Users get a new way to read newspapers.
- ii. User can interact with the application.

Experiment

AR is helping to increase the usefulness of any product or service and thereby increasing attention in the market. This tool is now being used in the media and publishing sector. Making object more appealing to the readers, AR is not only surprising the reader, but also creating the interest to know more. With the increase in the level of immersion in the material newspapers are no more as they were earlier.

Technology Used

Developing Apps takes time and planning. Before we begin the development process, we will need to decide on which language one require to get their project off the ground. The most widely used language in iOS app Development is “swift” which we have tried to implement in this project (Point, n.d.). The tools that been used for development of this application are Xcode (Apple, n.d.), a Physical device such as iPhone, a physical newspaper and an image linked to the story (.png ,jpg). The .mp4 video is also linked to the story. This brings us to a very important point for the ARkits app to work, with this world tracking, we need to have a certain hardware that is the A9 chip (Inc., 2020) or a chip more powerful than A9. That generally means that anything which was released after the iPhone 6 will be able to run the app but it won’t have world tracking enabled for those chips.

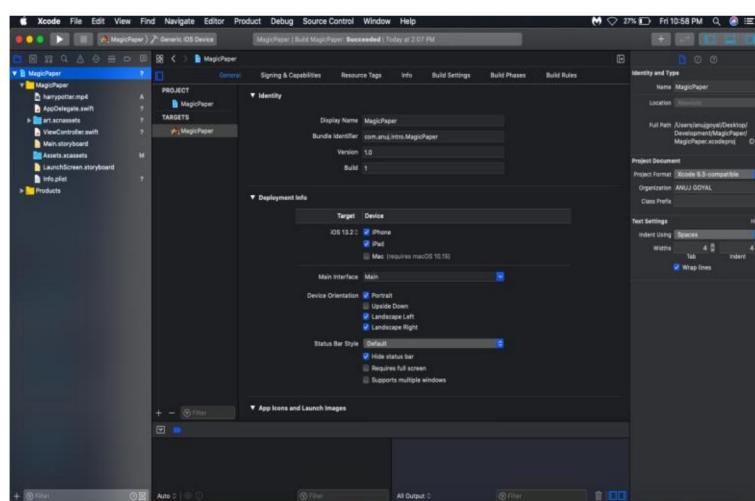


Fig 1: XCODE

A learning interactive project is developed to provide a platform for user to interact more in the learning environment compared to conventional learning environment.



Fig 2: Iphone and apps

How does an app work?

Let say we have an app that just has a single button on it “click me” when the user taps on it, then it senses the tap on the screen and register that tap and sends the message to the operating system which in the case is iOS (Technopedia, 2020). Then the operating system looks up the data it get from the sensor including thing such as how much pressure was applied on the phone at which location on the phone screen did it register that pressure and whole bunch of different things and the whole bunch of numbers but the operating system takes all these numbers and makes sense of it and what it does then you will know that this particular button on the screen of this particular app was tapped at this time point and then sends the message to the app and question telling it hey this button of yours is tapped then what it should do.

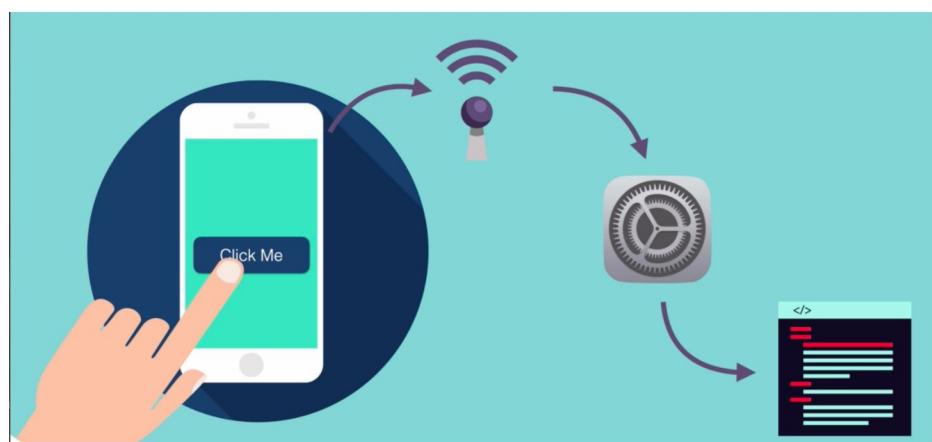


Figure 3: Working of an app

Implementation of The Newspaper App

Augmented Reality Apps for newspaper will help to bring publications content to live by adding digital elements to the printed material. The AR solutions in Newspapers Technology are intended to shape the future of the publishing sector. Some of them are mentioned below those are favourable to the adoption of AR solutions. With the worldwide adoption of latest generation of advanced and powerful smartphones and increasing curiosity and engagement of the people, apps are being download in huge

numbers. When it comes about revenue generation this new Newspaper technology may be able to generate independent revenue for the organisation. Scenario is just to provide solution where the information is more appealing to the users.

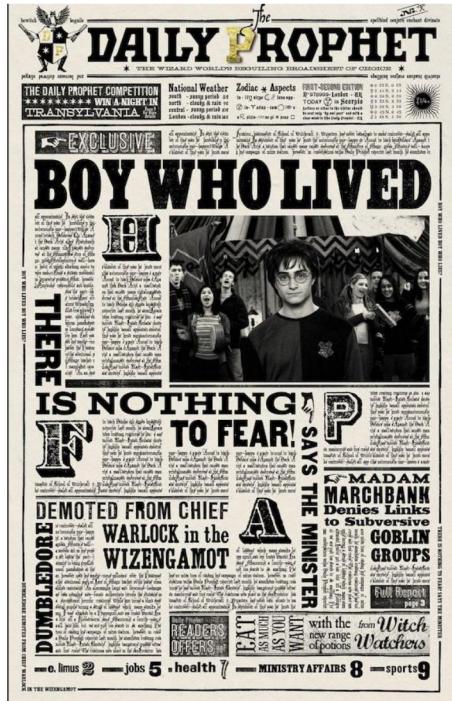


Fig 4: A classic newspaper.

What is apple ARKIT and what can you do with it?

AR in the term ARkit means Augmented Reality. It is a way of putting virtual objects inside the real world and making it appear as if the real and the virtual world are merged together magical. It is a huge endeavour and companies has invested around 1.5 billion in it. Magically it proved to be very revolutionary it is going to change the world and it is going to be an absolutely amazing revolution.

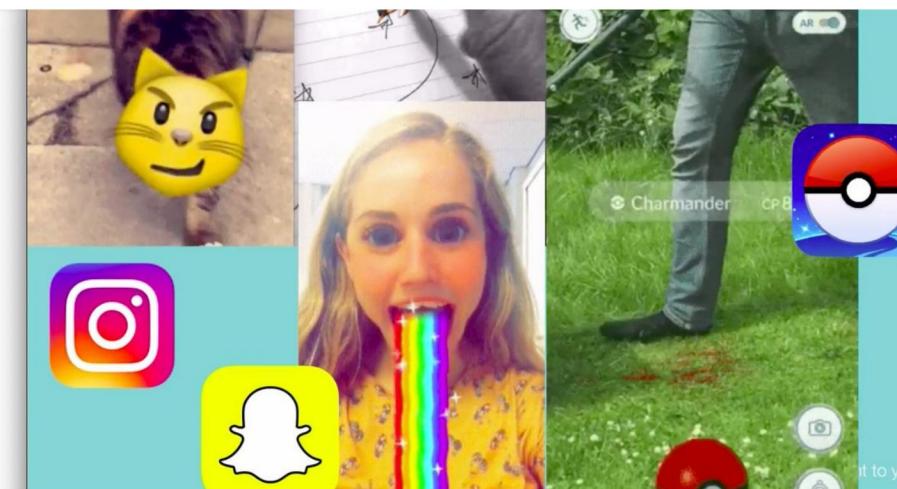


Fig 5: AR examples

How Does Arkit Work In Newspaper App?

It is basically a way of implementing augmented reality and pretty similar to other framework that implement augmented reality. Currently one of the most popular framework for implementing AR reality, specially when we are working with unity. Apple AR kit work in a similar way in essence that allows us to create and track correspondence between the real world space, 3D space and the virtual space that we create a model of some visual content.



Fig 6: AR software identifying an image

Source Code for Our App

```
// ViewController.swift
// MagicPaper
import UIKit
import SceneKit
import ARKit
class ViewController: UIViewController, ARSCNViewDelegate {
    {
        @IBOutlet var sceneView: ARSCNView!
        override func viewDidLoad() {
            {
                super.viewDidLoad()
                // Set the view's delegate
                sceneView.delegate = self
                // Show statistics such as fps and timing information
                sceneView.showsStatistics = true
            }
        override func viewWillAppear(_ animated: Bool) {
            {
                super.viewWillAppear(animated)
                // Create a session configuration

```

```
let configuration = ARImageTrackingConfiguration()
if let trackedImages = ARReferenceImage.referenceImages(inGroupNamed:
    "NewsPaperImages", bundle: Bundle.main)
{
    configuration.trackingImages = trackedImages
    configuration.maximumNumberOfTrackedImages= 1
}
// Run the view's session
sceneView.session.run(configuration)
}

override func viewWillDisappear(_ animated: Bool)
{
    super.viewWillDisappear(animated)
    // Pause the view's session
    sceneView.session.pause()
}

// MARK: - ARSCNViewDelegate
func renderer (_ renderer: SCNSceneRenderer, nodeFor anchor: ARAnchor)->SCNNode?
{
    let node = SCNNode()
    if let imageAnchor = anchor as? ARImageAnchor
    {
        let videoNode = SKVideoNode(fileNamed: "harrypotter.mp4")
        videoNode.play()
        let videoScene = SKScene(size: CGSize(width: 480, height: 360))
        videoNode.position = CGPoint(x: videoScene.size.width/2,
                                     y: videoScene.size.height/2)
        videoNode.yScale = -1.0
        videoScene.addChild(videoNode)
        let plane = SCNPlane
        (width: imageAnchor.referenceImage.physicalSize.width,
         height: imageAnchor.referenceImage.physicalSize.height)
        plane.firstMaterial?.diffuse.contents = videoScene
        let planeNode = SCNNode(geometry: plane)
        planeNode.eulerAngles.x = -.pi/2
        node.addChild( planeNode)
    }
    return node
}
}
```

Conclusion

In recent years, augmented reality technology has attracted extensive attention from researchers. Driven by computer vision and artificial intelligence technology, augmented reality technology has shown a strong momentum of development. Both the tracking registration accuracy, display equipment performance and the nature of human-computer interaction have been greatly improved. However, it can be seen that there are still many problems to be solved in augmented reality technology. In terms of tracking registration technology, the current tracking registration method can only make use of a small amount of information in the scene, such as feature point information, which leads to incomplete understanding of the system to the environment. In terms of display technology, the size and price of

augmented reality glasses that can provide users with a high sense of submergence cannot meet the demand of the public.

In terms of interaction mode, the more natural and multi-user augmented reality interaction technology remains to be studied. In the next few years, the application of augmented reality technology, especially in the application of mobile intelligent terminals, will emerge in a large number. Although mobile devices are less submersible than helmet-mounted displays, they are highly popular. At the same time, the launch of ARKit and ARCore development platforms realises the combination of augmented reality and smart mobile devices technically. In the future development, smart wearable devices, which can give full play to the advantages of augmented reality technology, will create a more realistic integration world for human beings. People can interact with the system in a more natural way of human-computer interaction. In the future, augmented reality technology will change human life to a great extent, which is an inevitable trend of scientific and technological development.

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