AR SMART NEWSPAPER

Prof. Pragati Pejlekar
Department of Information Technology
Saraswati college of Engineering
Kharghar, Navi Mumbai, Maharashtra
pragati.pejlekar@it.sce.edu.in

Shubham Patil
Department of Information Technology
Saraswati college of Engineering
Kharghar, Navi Mumbai, Maharashtra
shubhampatil3735@gmail.com

Dhiraj Naik
Department of Information Technology
Saraswati college of Engineering
Kharghar, Navi Mumbai, Maharashtra
dheerajnaike9@gmail.com

Bhavesh Patil
Department of Information Technology
Saraswati college of Engineering
Kharghar, Navi Mumbai, Maharashtra
bhaveshpatil2803@gmail.com

***Abstract*— Reading traditional newspapers or magazines is a common way to get the latest information about events or new products. However, these printed materials only provide readers with the static information. India's newspapers grew by relying on the advertising, a dependence that began to unravel before the pandemic struck. Due to Pandemic Shutdown news dailies have shut down and journalists have lost jobs. To revive their fortunes, they are trying to build incomes from digital medium. The increasing use of Internet search function, primarily through large engines such as Google, has also changed habits of readers. Introduction of augmented reality in the newspaper publishing can bring interactive learning experience to readers life. Augmented Reality can prove to be interesting feature in newspaper which would take the readers over and beyond the inked pages. With advancements in Unity and Vuforia augmented reality can play a role in helping journalists provide information more conveniently while letting viewers get a closer insight to news stories. The results and evaluation of the paper shows the interactive way of reading newspaper experience and can increase newspapers circulation.**

Keywords- Augmented Reality, Vuforia, Unity, Newspaper, Digital Medium

I. INTRODUCTION

Augmented reality is such a technology within which we are able to see the objects in physical world visually, providing a composite read. Reading traditional newspapers or magazines is a common way to get the latest information about events or new products. However, these printed materials only provide readers with the static information. Readers may want to know more and detail information about some product in an article or to watch video clips related to an event mentioned in the news right at the moment when they read that article or news. We are Creating an Application with mobile devices that can provide extra information and multimedia for readers by applying augmented reality to traditional newspapers. A user can enjoy extra rich multimedia information on a product or a news on his/her mobile device just by looking at an article in a traditional newspaper through his/her mobile device.

The system detects image in article and then it shows video related to detected image in a mobile device and provides a reader with video subtitles and voice over for news. AR technology creates models from the content that take a brand new experience to readers of any age to the next level. In this project, we are implementing an app in which we will be having an interactive newspaper with interactive news images. The newspapers will contain the live images that will add extra detail and colour to live and adapt. We will be using latest feature of Vuforia to turn our newspaper into a magical newspaper that can play the content that is relevant to the image that is being detected. It will turn a boring and standard newspaper into something that is extremely interesting and thus it revamps the experience of reading newspaper.

II. LITERATURE SURVEY

In Paper [1]. An augmented reality image registration method based on improved ORB was proposed. In the process of the Augmented Reality (AR) image registration, the traditional ORB (oriented FAST and rotated BRIEF) algorithm has the low registration rate and poor real-time performance. In this paper, an improved AR image registration method based on the improved ORB is proposed. Firstly, the calibration image and video frame image feature points are obtained by improved FAST feature detection algorithm. Then, binary descriptor of BRISK, which using the custom domain sampling pattern is used for the feature description, and scale invariance of the traditional ORB algorithm is then improved. Finally, the random sampling consistency (RANSAC) algorithm is used to eliminate the wrong matching point pairs and optimize feature matching. Experiments shows that compared with the AR image registration method described by the traditional ORB algorithm and FREAK feature, the registration rate of the proposed algorithm is increased by 1.1% and 8.4%, and the generation time is then reduced by 0.13s and 0.12s, respectively. The experimental results show that AR image registration method proposed in this paper can obtain higher feature point registration rate and thus has better real-time performance, which can better meet the application needs of AR image registration

In Paper [2] Augmented Reality Application for Newspapers, they 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 to it and colour to live and adapt. They have used latest feature of ARKit to turn newspaper into a magical newspaper that play the content that is relevant to the image that is being detected .It is basically a way to implement augmented reality, and it is similar to other frameworks to implement augmented reality. Currently one of the most popular framework for implementing AR reality, especially 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.

In Paper [3] Examining augmented reality in journalism, they argued about use of augmented reality in journalism. Photorealistic visuals are used in the news to support the

journalistic norms of accuracy and authenticity. According to these aspirational norms, visual journalism should depict events in a comprehensive, realistic, and truthful manner. These norms provide a foundation for the journalism's role as a truth-teller in society. By claiming to operate within the these normative boundaries, journalism differentiates itself from other communication practices, such as advertising and propaganda. With its immersive features and 3D renderings of the objects, AR has the potential to contribute to the perceived accuracy, authenticity, and credibility of visuals, similar to the video and multimedia. This, in turn, can increase the perceived credibility of the news reporting. Perceived realism and sense of presence in VR have been shown to have a positive association

In Paper [4] they have explored Augmented Reality Dynamic Image Recognition Technologies Based on Deep Learning Algorithms, This paper combines a convolutional neural network that can learn good feature information with the integrated learning that has good recognition effects. In the recognition tasks of MNIST database and the CIFAR-10 database, comparison experiments were performed by adjusting the hierarchical structure, activation function, descent algorithm, data enhancement, pooling selection, and number of feature maps of improved convolutional neural network. The convolutional neural network uses a pooling size of 3*3, and uses more cores (above 64), small receptive fields (2*2), and more hierarchical structures. In addition, the ReLU activation function, gradient descent algorithm with momentum, and enhanced data set are also used. The research results show that under certain experimental conditions, the dynamic image recognition results have dropped to a very low error rate in the MNIST database, and the error rate in the CIFAR-10 database is also ideal.

In Paper [5] They have examined Capabilities of ARCore and ARKit Platforms for AR/VR Applications. ARCore and ARkit capabilities were scrutinized and compared. Authors established comparison criteria for both platforms, developed test applications and ran comparison tests. Obtained results can be a help in choosing the right framework to speed up prototyping and development of modern AR/VR applications. This work consists of a comprehensive comparison of these new frameworks in the following respects: general performance (CPU/memory use), mapping of planes on various surface types, influence of light and movement on mapping quality etc.

In Paper [6], they have examined the performance of 3D object detection performed on augmented reality based on the Vuforia. The research scenarios based on results of the analysis of the Vuforia working principle. The study conducted with three angles of shooting and on the several variations of light intensity and distance of the object. The research also conducted by covering part of the object's surface. The results showed that the Vuforia was able to detect those objects well in several scenarios that applied with a success rate of 87.5%. The success rate of object detection strongly influenced by the surface area of the detected object and intensity of the light space.

III. COMPARATIVE ANALYSIS

Papers / Parameter	An augmented reality image registration method based on improved ORB	Augmented Reality Application for Newspapers	Examining augmented reality in journalism: Presence, knowledge gain, and perceived visual authenticity	Augmented Reality Dynamic Image Recognition Technology Based on Deep Learning Algorithm	Capabilities of ARCore and ARKit Platforms for AR/VR Applications	Performance Analysis of Augmented Reality Based on Vuforia Using 3D Marker Detection
AR Used	Yes	Yes	Yes	Yes	Yes	Yes
ARCore Used	No	No	No	No	Yes	No
ARKit Used	No	Yes	No	No	Yes	No
Vuforia used	No	No	No	No	No	Yes
Deep Learning Used	No	No	No	Yes	No	No
ORB used	Yes	No	No	No	No	No
Android App	No	Yes	No	No	No	No

Fig: Comparative Analysis of Literature survey

IV. PROBLEM STATEMENT

The increasing use of Internet search function, primarily through large engines such as Google, has also changed habits of readers. Instead of perusing the general interest publications, such as newspapers, readers are more likely to seek particular writers, blogs or sources of information through targeted searches, rendering the agglomeration of the newspapers increasingly irrelevant. India's newspapers grew by relying on the advertising, a dependence that began to unravel before the pandemic struck. News Dailies have shut down and journalists have lost jobs. To revive their fortunes, they are now—belatedly—trying to build incomes from digital medium. So, we are using Augmented Reality, and taking advantages of new digital news boom for readers to return to newspapers again.

We will be using latest feature of Vuforia to turn our newspaper into a magical newspaper that can play the content that is relevant to the image that is being detected. It will turn a boring and standard newspaper into something that is extremely interesting and it revamps the experience of reading the newspaper. As Providing AR coverage of certain inventions makes a news story a lot less abstract, giving viewers the freedom of visualization. Our AR Smart newspaper will, play a role in helping journalists provide information more conveniently while letting viewers get a closer insight to stories.

V. PROPOSED SYSTEM

The main objective of this project is to develop an android newspaper application which uses augmented reality. and languages used will be swift, ShadderLab, C#. We will be using latest feature of Vuforia to turn our newspaper into a magical newspaper that play the content that is relevant to the

image that is being detected. We will include news for various categories and will include relevant content related to it in our application.

We are using unity for development of aur application, we will be creating multiple image targets for different types of news in our project. For database we are using Vuforia sdk. We will build our application for android using unity android sdk. In our application The back camera of the device will search for a scene and when it recognizes the scene using Vuforia Image Tracking, by scanning the image in the newspaper, then the video is played in its position which livens up the experience of reading newspaper.

The software product of this project, from the business perspective, creates new business marketing dimension in digital publishing and increases the selling profits in newspaper publication business. Our AR Smart Newspaper could be very helpful for newspapers to attract young audience to newspapers due to augmented reality experience and it can also attract older audience of newspapers as user can enjoy extra rich multimedia information on a product or a news on his/her mobile device just by looking at an article in a traditional magazine through his/her mobile device.

5.1. Flowchart:

Fig.1, explains the actual flow of the project. at first user wil open application an then application camera will try to detect image on newspaper using marker. After reading the marker video contend related to the image will be played on the image in our application.

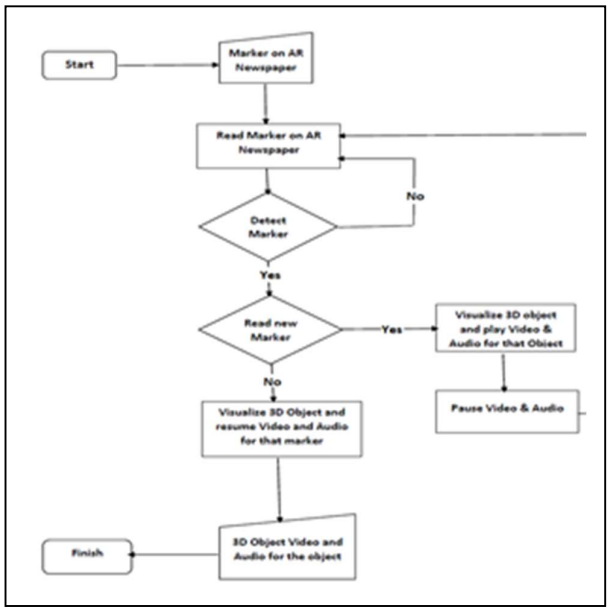

Fig.1 Flowchart

5.2 Block Diagram:

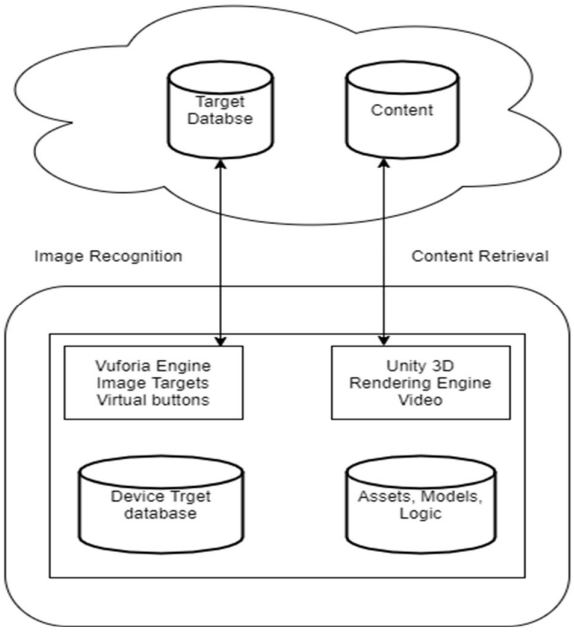

Fig 2 Block Diagram:

Fig.2, the figure describes the architecture of the application that takes the real view as input with the help of AR camera then process it with the virtual object to get the video output on newspaper image. The system basically uses a mobile phone built-in camera that supports Augmented reality to scan newspaper image the match its features with content stored on Vuforia database. unity 3d rendering unit then will import video content from Vuforia to mobile application and video will be played on newspaper image related to news with captions.

VI. DETAILS OF HARDWARE AND SOFTWARE

6.1 Hardware Specification

- Android Smartphone
- I3+ Processor System
- Sensors like Accelerometer, Gyroscope, Magnetometer
- Camera

6.2 Software Specification

- Vuforia
- Unity
- Android Studio Sdk

VII. IMPLEMENTATION

The main objective of this project is to develop an android newspaper application which uses augmented reality. and languages used will be swift, ShadderLab, C#. We will be using latest feature of Vuforia to turn our newspaper into a

magical newspaper that play the content that is relevant to the image that is being detected. We will include news for various categories and will include relevant content related to it in our application.

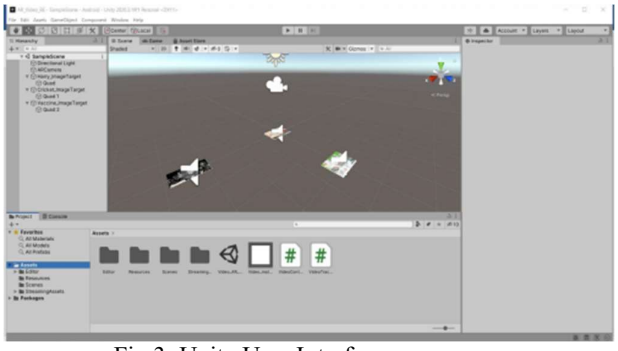

Fig 3: Unity User Interface

We have used Unity for texturing an rendering of elements and video, image assets. Then we loaded Assets into the scene hierarchy by using Game Objects like AR Camera and image target. To see our scene in action we have used the Vuforia Engine Play Mode in the Game View that you can activate by pressing the Play button. Play Mode is configured in the Vuforia Configuration section and can be used as a webcam, simulator modem, or recording mode to test Vuforia targets.

We imported image assets through Image Target databases from the Vuforia Target Manager and added relevant target video in Unity Video Renderer. We have used C# script edited in Visual Studio to Play and Stop the Video Player by placing the script on the Image Target.

Fig 4: App Implementation in Unity

For Exporting our Unity Project to android application in .apk format we have used Android Studio SDK with Compatibility from Android 5.0 version to the latest edition of android. For our Vuforia image target assets we have used Vuforia Engine for Android SDK. After Successful Build of project, we have exported it into an android application.

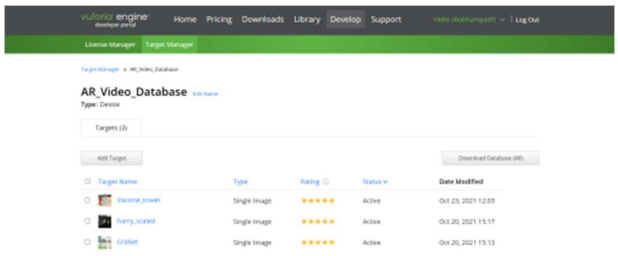

Fig: Vuforia Database

We have used Vuforia as database for our Image Targets. The Target Manager then processes the images to generate both data and visual representations of the target's feature and generates expected detection and tracking performance rating. Then we have imported the Image Targets by downloading as a package suitable for integration in both native and Unity.

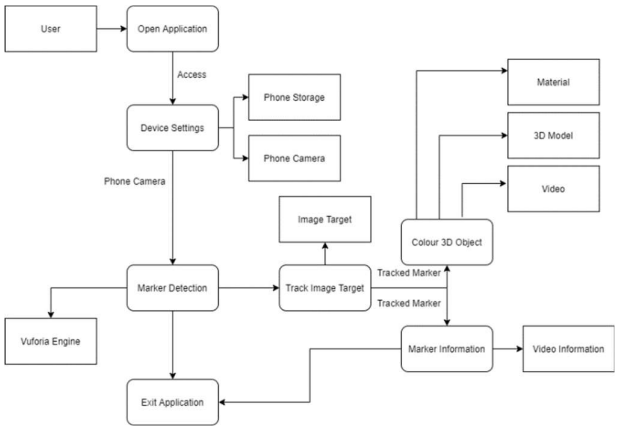

Fig 5: Working Model of Application

In our application the back camera of the device will search for a scene and when it recognizes the scene using Vuforia Image Tracking, by scanning the image in the newspaper, then the video is played in its position which livens up the experience of reading a newspaper. All this video assets for newspaper will be rendered in Unity and image tracking and recognition will be done using Vuforia. We will be using latest feature of Vuforia to turn our newspaper into a magical newspaper that play the content that is relevant to the image that is being detected.

VIII. RESULT

Fig 6: App Startup

Fig 7: Video related to news played on newspaper with captions and voice.

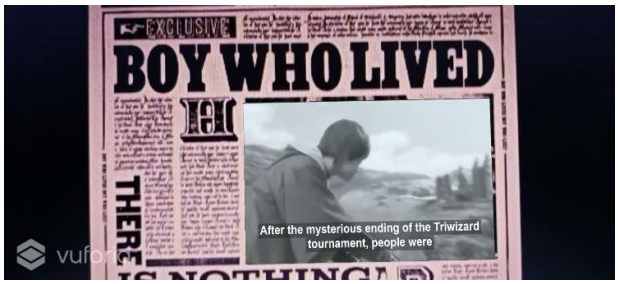

Fig 8: Result for App in Landscape mode with video playing on newspaper

IX. CONCLUSION

We can create a successful way of human interaction with the newspaper with the help of AR Smart Newspaper, So by taking advantages of digital boom we can strike a balance between AR and Newspaper. For the future developments it can be enhanced by developing this system for big newspapers or magazines. In future development, smart newspapers, which can give full play to the advantages of the augmented reality technology, will create a more realistic integration world for us human beings. As People can interact with the system in a more natural way of human-computer interaction using AR.

X. REFERENCES

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