

PROBABILISTIC ANALYSIS OF INDIAN COVID-19 DATA WITH INTERACTIVE REAL TIME AUGMENTED REALITY

Mr. Nikhil Anvekar*¹, Prof. Sudhir Shinde*²

*¹M.Tech Student, Department Of Computer Science And Engineering N K Orchid College Of Engineering & Technology, Solapur, Maharashtra, India.

*²Professor, Department Of Computer Science And Engineering N K Orchid College Of Engineering & Technology, Solapur, Maharashtra, India.

ABSTRACT

In Our daily lives an Augmented Reality Application are common, such as in smartphones This AR application can be used in entertainment, engineering, medicine and education. The main moto of this project is to awareness of area where the corona had been positive and their relevant results with respect to digital format which gives an immersive experience to the user to see run time cases of corona in virtual format with augmented world which is an existing world. This Project is for Android device and the climax of this application is to track the covid-19 data and show in digital form with the help of augmented reality. Currently India is facing problem related to controlling of the virus outbreak and has managed its growth rate. With the help of exponential and polynomial regression modelling, the predictions can be done for infected people for next 30 days.

Keywords: Augmented Reality Technology, Machine Learning. Mixed Reality, Gamification, Visitor Engagement.

I. INTRODUCTION

Augmented Reality is visual influence to 3d real world environment where the objects that reside in the real world are enhanced by computer-generated, auditory, sometimes across multiple sensory modalities, including visual, perceptual information somatosensory and haptic. Today India is facing a huge problem of pandemic situation in this period, new infection occurs in a person who has not been in contact with an infected person or someone who travel through the virus-hit countries. At this stage, the virus spread is practically uncontrollable, and the country can have many major clusters of infection, but with the help of predictions can be done for infected people for next 30 days. Now a day's covid19 virus speeding all over India and more cases of the coronavirus disease has been recorded, according to the Union health ministry data.

The major goal of this project is to save COVID-19 data; therefore, it provides data in the form of augmented reality, which depicts data such as recovery rate, active case, confirmed case, and death rate. Through this application, the all details of Covid-19 virus that is confirmed cases data all over India in augmented reality, which makes immersive view. For example, when we open this application we will see a India map on which we can touch that particular state through android mobile on which is application will run.

II. LITERATURE REVIEW

Augmented reality is a type of technology that intelligently combines virtual and real-world data. Multimedia, three-dimensional modelling, real-time tracking and registration, intelligent interaction, and sensing have all been employed extensively [1],

Most of the libraries for creating augmented reality applications are accessible in the development world; their capability varies based on the technology used to identify and track an item, points, or characteristics in a scene. In this, we will look at the ARCore open source frameworks that let you see a virtual object in real life. Their purpose is to combine digital and real-world material and information. They can interface with the device's components (camera and screen) to identify and track scene features and insert virtual content. This research implements and concretizes the various augmented reality features that can be used to enhance the real environment with new information [2]. It is a branch of Augmented Reality in which three-dimensional virtual items are seamlessly blended into a three-dimensional real-world environment in real time. It describes the applications that have been investigated in the fields of medicine, manufacturing, visualization, path

planning, entertainment, and military. A full examination of the tradeoffs between optical and video blending technologies is included in this description of the characteristics of Augmented Reality systems. Two of the most significant challenges in developing functional Augmented Reality systems are registration and sensing mistakes [3]. Augmented reality, which is frequently constructed in a 3D environment, aims to add virtual content to the real world while also allowing users to engage in real time. Virtual objects' objective is to provide useful and courageous information to an Augmented Reality system's user, giving it new meaning. Using electrical gadgets with a camera sensor, this combination is conceivable. Virtual images are superimposed on the reality captured by the camera of the tablet or smartphone, which is now the most extensively utilized [4]. In the development realm, ARFoundation offers a variety of frameworks and SDKs for creating Augmented Reality Applications. The user's ability to identify, track, and position one or more objects, points, or features in a scene affects their functionality. In this article, we will learn about ARFoundation and one of its SDKs, ARCore, an open framework that not only shows virtual information in the actual environment, but also identifies it. By adding virtual content, it may interact with the device's components and the actual environment [5]. Virtual objects may be smoothly inserted into a picture sequence using augmented reality (AR). In order to achieve this aim, synthetic components must be generated and positioned in the picture in a precise and aesthetically appealing manner. This problem's solution can be linked to a posture estimation or, more precisely, a camera localization method [6]. According to the study in [7]. Augmented reality is a relatively new technology development that can be used in a variety of sectors [8]. Methods for using the brain through games to prevent the elderly's head and body hypo function have been proposed [9]. A Marker-less application [10], recognizes unregistered items. This method's implementation is extremely difficult. The algorithm that recognizes the items must be able to distinguish a variety of features in the scene, such as patterns, colors, and other qualities [11]. Due to fast technological advancements, today's applications choose marker-less techniques. Augmented reality has been a part of our daily lives for some years, with apps like Snapchat and Messenger, the IKEA catalogue, and the Pokemon GO! Game, as well as various scientific articles employing the technology [12][13][14][15]. ARCore supports the following 3D file types: .obj.gltf.fbx [16]. Blender, for example, is used to produce these 3D formats [17]. The libraries want to create augmented reality application that use a smartphone to add 3D digital information to the actual environment for both platforms offer advantages and disadvantages[18]. Augmented reality is created using image processing and 3D rendering technology. Developing augmented reality apps necessitates the use of software that allows for 3D rendering. Unity has responded by launching ARFoundation [19].

III. IMPLEMENTATION

Step-1: The application should launch with a camera, which will enhance the 3D line graph in the existing surroundings, creating a more immersive line graph experience.

Step-2: The graph is made up of one month's worth of confirm covid-19 data, from which a probabilistic analysis is generated using a Machine-learning algorithm that generates the next month's graph.

Step-3: The data from India's Covid-19 is visualized via augmented reality, which displays real-time data on confirmed, active, recovered, and death rates.

Step-4: The covid-19 detailed data is displayed not only on an Indian map, but also on a state map with district information for the covid-19 case using interactive 3D augmented reality.

Step-5: For the user who is concerned about India's Covid-19 data, there is a fun or entrainment view. The game features a covid-19 3D model that is Shoot in augmented reality at a certain moment.

IV. RESULT

According to the findings, the project is based on a probabilistic analysis of Indian COVID-19 data combined with an interactive real-time augmented reality model for viewing in an existing context. This program uses augmented reality to interact with data from Covid-19 confirmed, deceased, recovered, and active cases in a virtual environment. It also has a feature called enhance. When we open the app, the camera mode that comes with it activates. This is the start of my application, which represents the program's menu. About, Warning, Probabilistic, Covid-19 Data, Game Mode, Exit, and Credits are all available via this menu item. Each menu choice has its own set of attributes.

4.1 About

About gives a comprehensive introduction of the application, as well as details on Probabilistic Analysis of Indian COVID-19 Data with Interactive Real-Time Augmented Reality..

4.2 Warning

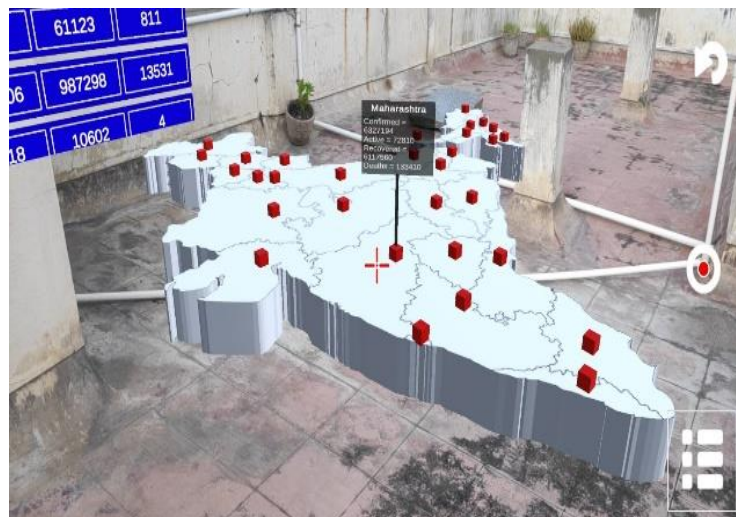
When we click the warning button, the following message appears, containing details about the alert. Via a gadget, augmented reality connects the actual world with digital data. The user must be aware of his or her surroundings when using the application. The user is not required to move physically in order to use the application. For users under the age of 15. While using this application for the augmented reality experience, it is recommended that you have parental supervision.

4.3 Probabilistic

When we select the Probabilistic button which will show in a graphical manner, this probabilistic presents the monthly information of Covid-19 data. The prediction button will show once the graph has been plotted in augmented reality with the correct monthly data. The prediction button will be visible once the graph is fully displayed. The forecast of covid-19 data is shown by the blue color line, as I employed a machine learning method to provide future knowledge of covid-19 data, resulting in a probabilistic approach for the following month.

4.4 Covid-19 Data

We may acquire an Indian 3d map with state and city details by clicking on the covid-19 data button. This graphic is about Indian covid-19 data and features a 3D immersive view of all Indian states and cities with current covid-19 instances. The different states of India are represented by the red blocks in this illustration. The red block situated above the state of India will pop-up with detail information of state name covid-19 instances such as confirmed, active, recovered, and death rate when the middle red marker is moved as per the camera or mobile movement of the application. When we click on the right side of the application, we receive a marker enable option. Because the marker option is enabled by default in this application, we can disable it if we don't require it. When we click on a red block, such as Maharashtra, we will be sent to a new window with a 3D view map of Maharashtra. This map is accompanied by a detailed Maharashtra city list that appears above the map. In augmented reality, you can navigate through this city list. The city list includes information on confirmed, active, recovered, and death rate covid-19 cases. In Maharashtra, for example, we have cities like Solapur and Beed.



4.5 Game Mode

There is a gaming option called Corona Shooting that is used for entertainment. This corona shooting game features a variety of corona colors as well as an augmented reality experience in 3D space. At the left of the program, there is a shoot button that reacts to the central red marker. If we place the marker just above the corona 3d object and press the shot button at the same time, the corona will be destroyed and we will receive

some points. When there is a time constraint, such as 2 minutes, the game becomes more engaging. We only have 2 minutes to finish the game. Because we fire a lot of Corona, we'll gain points in a short amount of time. Once the timer runs out, the game ends and the last score is displayed based on the user's performance.

4.6 Credits

Displays information for a developer.

4.7 Exit

This button, as the name implies, will terminate the application with an exit sound.

V. CONCLUSION

This Android app combines a probabilistic analysis of Indian COVID-19 data with an interactive immersive Augmented Reality experience. This is an augmented reality covid-19 cases detail of Indian state with digital format that is augmented in existing environment to provide an immersive experience with 3-d view that allows users to learn about covid-19 cases of Indian state of confirmed, recovered, dead, and active cases.

Corona shooting is a game mode in which you can fire coronas at other players. This game makes advantage of augmented reality to make all corona models appear genuine in their surroundings, letting us to play a shooting game in the real world without the use of any external equipment. We only require a smartphone.

VI. REFERENCE

- [1] S. Yan, M. Yu, X. Wei and C. Wang, "ARTowerDefend: A Shooting Mobile Game Based on Augmented Reality," 2019 International Conference on Virtual Reality and Visualization (ICVRV), 2019, pp. 268-270, doi: 10.1109/ICVRV47840.2019.00064.
- [2] Z. Oufqir, A. El Abderrahmani and K. Satori, "ARKit and ARCore in serve to augmented reality," 2020 International Conference on Intelligent Systems and Computer Vision (ISCV), 2020, pp. 1-7, doi: 10.1109/ISCV49265.2020.9204243.
- [3] R. T. Azuma, « A Survey of Augmented Reality », p. 48, 1997.
- [4] D. Chatzopoulos, C. Bermejo, Z. Huang, et P. Hui, « Mobile Augmented Reality Survey: From Where We Are to Where We Go », IEEE Access, vol. 5, p. 6917 6950, 2017, doi: 10.1109/ACCESS.2017.2698164.
- [5] Z. Oufqir, A. E. Abderrahmani, et K. Satori, « Important Method for Detecting and Tracking Based on Color », vol. 8, no 5, p. 5, 2019.
- [6] E. Marchand, H. Uchiyama, et F. Spindler, « Pose Estimation for Augmented Reality: A Hands-On Survey », IEEE Transactions on Visualization and Computer Graphics, vol. 22, no 12, p. 2633 2651, déc. 2016, doi: 10.1109/TVCG.2015.2513408.
- [7] M. T. Abhishek, P. S. Aswin, N. C. Akhil, A. Souban, S. K. Muhammedali and A. Vial, "Virtual Lab Using Markerless Augmented Reality," 2018 IEEE International Conference on Teaching, Assessment, and Learning for Engineering (TALE), 2018, pp. 1150-1153, doi: 10.1109/TALE.2018.8615245.
- [8] Chang G., Morreale P. and Medicherla P. (2010). Applications of Augmented Reality Systems in Education. Proc. Int'l Conf. Soc. For Information Technology & Teacher Education, vol. 2010, pp. 1380-1385.
- [9] Y. Tokuyama, R. P. C. J. Rajapakse, S. Yamabe, K. Konno and Y. Hung, "A Kinect-Based Augmented Reality Game for Lower Limb Exercise," 2019 International Conference on Cyberworlds (CW), 2019, pp. 399-402, doi: 10.1109/CW.2019.00077.
- [10] J. P. Lima, F. Simões, L. Figueiredo, et J. Kelner, « Model Based Markerless 3D Tracking applied to Augmented Reality », vol. 1, p. 14, 2010.
- [11] P. Honkamaa, S. Siltanen, J. Jäppinen, C. Woodward, et O. Korkalo, « Interactive outdoor mobile augmentation using markerless tracking and GPS », p. 5.
- [12] R. Bergquist et N. Stenbeck, « Using Augmented Reality to Measure Vertical Surfaces », p. 12.
- [13] C. T. Tan et D. Soh, « AUGMENTED REALITY GAMES: A REVIEW », p. 9.
- [14] R. Cervenak et P. Masek, « ARKit as indoor positioning system », in 2019 11th International Congress on Ultra Modern Telecommunications and Control Systems and Workshops (ICUMT), Dublin, Ireland, 2019, p. 15, doi: 10.1109/ICUMT48472.2019.8970761.

-
- [15] X. Zhang, X. Yao, Y. Zhu, et F. Hu, « An ARCore Based User Centric Assistive Navigation System for Visually Impaired People », Applied Sciences, vol. 9, no 5, p. 989, mars 2019, doi: 10.3390/app9050989.
- [16] «Import and preview 3Dassets|ARCore»
- [17] Google Developers. <https://developers.google.com/ar/develop/java/sceneform/importassets?hl=fr>
- [18] B. Foundation, « blender.org - Home of the Blender project - Free and Open 3D Creation Software », blender.org. <https://www.blender.org/>.
- [19] P. Nowacki et M. Woda, « Capabilities of ARCore and ARKit Platforms for AR/VR Applications », in Engineering in Dependability of Computer Systems and Networks, vol. 987, W. Zamojski, J. Mazurkiewicz, J. Sugier, T. Walkowiak, et J. Kacprzyk, Éd. Cham: Springer International Publishing, 2020, p. 358370.
- [20] « Framework AR Foundation d'Unity | Unity ». <https://unity.com/fr/unity/features/arfoundation>.