

Augmented Reality in Tourism: An Application to Provide Virtual view in Real World

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Abstract- this paper gives a brief review on the augmented reality in tourism. Even after having rich Tourist places in India we don't capitalize a lot upon it. Wanderlust of Indians has been the reason for the selection of this topic. According to statistics, 60% of the full-time employees spend more than 30,000 rupees! The project is about creating a mobile application which will be given to the tourist guides which when placed at different places in the Monuments, Museums etc. will be able to create a virtual view of different objects which will provide a great user experience. Places like the king's palace, stationary canon, unused swords, lost diamonds or any ornaments, or water which consists of eels and crocodiles can be recreated and well visualized. In short, Augmented Reality will be a great tool to regenerate the lost shrine of the places. It will be a great asset to India's per-capita income as this increases the Tourism, improves the user's experience, though the person cannot understand the language, the virtual visuals speak the rest.

Keywords- Geo based Augmented Reality, Wikitude, Blogger, onclick functionality

I. INTRODUCTION

This Project is the enhancement of the preexisting methodology of the tourism in India. Where the guide explains the tourists regarding the place and extra information is usually not given by them. The goal of this project is to introduce AR(Augmented reality) in Tourism in India. Because this technology will certainly flourish in the coming years and will engulf the world with its interesting content. The project is about creating a mobile application which will be given to the tourist guides which when placed at different places in the Monuments; Museums etc. will be able to create a virtual view of different objects which will provide a great user experience. The guide will make use of this application either offline or online directly if bought license from Wikitude. Dynamically the images can be added through cloud and the certain augmentations are added respectively. It will also help in understanding more about the place for the user as onclick target images are also there. Which will provide extra

information about any certain person or thing. Any extra information will be provided in the form of the blogger or Wikipedia website. As we cannot do it for any heritage site, we have done it on our college like a "college guide" which will be a guide of our college and will help the outsiders have a good and amazing experience.

The college guide will guide any new visitor or new comer to the college and help him know about the college and the staff which is working in it. If they have more anxiety to know about the college they are redirected to our college website upon clicking the image augmentations generated on the particular target images or video (which illustrates all the information about it) augmentation can also be played when the target image is recognized.

The above system is going to lure the people to see what it is actually and make the people fascinate and it is self-explanatory (easily understood by the people).

The present system is not so fantastic and amusing; it may need the help of some other technology to help it make an outstanding system.

Augmented reality is the technology which is to be used which shapes out the perfect solution to this problem.

Augmented reality (AR) is a type of interactive, reality-based display environment that takes the capabilities of computer generated display, sound, text and effects to enhance the user's real-world experience.

The above technology is in the stage of infancy in the year 2019 as we move towards the 2030s certainly it will have an impeccable impact on the technology and it certainly going to be a revolution. It is very helpful in the fields of education, entertainment, gaming and many more fields.

Image Recognition and Tracking is the feature provided by Wikitude Augmented Reality that gives apps the ability to detect 2D images, triggering digitally augmented content to appear in the form of videos, slideshows, 360° panoramas, sound, text, 3D animations, and more.

Image Recognition of Wikitude is used in this project for the different directing boards and pictures of blocks (like Computer Science and Engineering, Electrical Engineering etc.) present in our campus which will guide the new comers with the help of information present in the blogger website and different augmentations.

II. EXISTING SYSTEM

- Existing system is that the people will just view and only some part of the things is known in any tourist place.

- Language is certainly a great Problem. If you cannot understand what he says you need to understand the gestures and try to understand what his intention.
 - Where languages become a barrier, Virtual views become an added asset to run our proceedings smoother
- The guides explain the tourists regarding the vivid places neatly, if it is a monument then about the divisions of the place orally and sometimes, he might even use the real time examples and help the tourists understand in an efficient manner. The explanation of the guide might be understood by some of the people while the rest abort to understand what he is saying because the guide has a lot of things to cover to satisfy the tourist who is full of curiosity. The language of the guide is not understood by the tourist then it is certainly a major issue to be taken in consideration. Hence, the enhancements must be made to the existing system.

III. PROPOSED SYSTEM

- In this system we are using object detection and display the 3D models with which the user can interact with and get the new experience while using the application and with the AR model visually present in the mobile.
- This is based on the cloud and blogger which works with the one click functionality
- MERITS
- Using Augmented Reality
- Leads to more profits
- Could be certainly be a great asset
- Improves Users Experience

DEMERITS

- Might take time for object recognition sometimes
- It is not location based augmented reality; it is only an object based that is target image trigger based application.

The proposed system consists of a virtual world with different augmentations which will help the tourists understand in a better way by looking at the virtual pictures, videos, 3d objects. It will certainly enhance the user experience and make the create an interest on the place visited. As the crowd grows in number, the throngs come to experience this new advanced technology. This will in turn increase the revenue of the tourism system and helps the government in some or the other way. Here, Object recognition engine is used to detect the target images. The overlay images, videos, 3d objects may take some time to display depending upon the scatteredness of the pixels of the target image. (only for poor quality images). Geo-based augmented reality is an enhancement to this project where your place virtual object based on location based that is on latitude and longitude based which will need the help of Global positioning system.

IV. PROBLEM STATEMENT

The problem is people invest a lot of amount to go to different places to experience their culture and know about their culture and to know about the history behind that place. In the process of doing it they must be entirely satisfied before leaving the place like they have come to know about the entire place. Otherwise all the money invested will be in vain.

4.1 Money invested in Tourism

Though India has got a vivid variety of heritage places still the revenue from it is not up to the mark. Only by introducing some technology into this field will help the completion of objectives and it will become a great contributor to the Gross Domestic Product of the India. This can only be possible with the help of augmented reality which is a virtual world which comprises the objects, images and etc. of our choice. With the help of Augmented reality we can breakthrough this problem as it provides rich virtual views which will fascinate and lure the tourists to the tourist spots. India has the record of tourists who like to visit different places, they separately save money for the traveling as it provides them immense pleasure and recreation. People with curiosity will have feast to their eyes and will promote this technology which is being used which will in turn spread through mouth publicity and people start to hit India frequently like how the waves hit the shore of the sea.

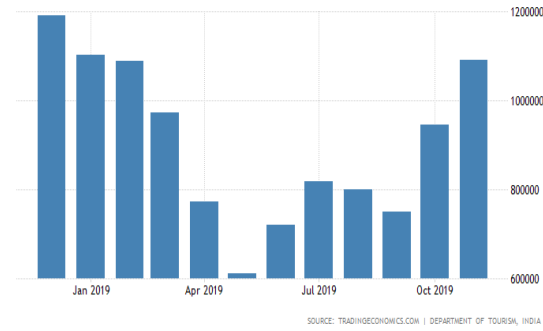


Figure 1: Indian tourist arrivals in the year 2019

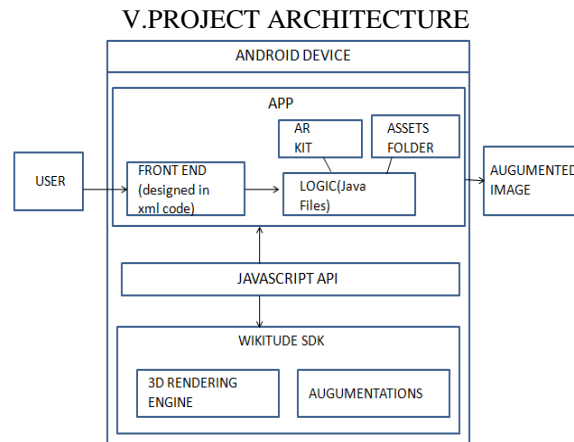


Figure 2: System Architecture

The above image shows the project architecture where the front end design is designed in eXtensible Markup Language and the code is written in java to make the necessary functionalities work efficiently and here both the target and overlay pictures are stored in the asset folder of the android studio. The flow starts from the JavaScript api (Application Programmable Interface) calls the Wikitude sdk (System development Kit) and with help of the 3d rendering engine the target image is recognized the overlay image is imposed on it. Then, eventually the augmented image, video, 3d object is displayed. JavaScriptapi (application Programmable Interface) acts as the mediator between the application and Wikitude sdk (System Development Kit).

VI. TOOLS AND TECHNOLOGY

Wikitude studio is used to make the necessary augmentations and the project is exported to the asset folder of the android studio and required logic is written in java and eXtensible Markup Language to implement the necessary functionalities. Android studio is used for the necessary for imparting the necessary functionalities and deployment of the application.

Unity 3d vs. Wikitude studio

Unity 3d is the software, which is mostly used for augmented reality, but it needs a good computationally fast computer with a good graphics card or else it will slow down the system. It supports both the ios and android users. The 3d augmentations are supported in a better way.

Wikitude studio project deployment is done with the help of android studio which supports only android users but not the users of ios. But it is relatively fast and doesn't need a system with good configuration. The 3d augmentations are introduced in the Wikitude studio of file extension.wt3 (.wt3 means Wikitude tracker) which is done with help of Wikitude 3d encoder which supports only the mac OS systems, the system with windows OS is not supported. Wikitude cloud is that which contains the entire set of target images and the set of different augmentation are applied onto them.

VII. ABOUT SLAM TECHNOLOGY

SLAM is abbreviated as Simultaneous Localization and Mapping. SLAM technology is defined as where device can create a view of its surroundings and places itself in the map in real-time properly and SLAM technology is specifically useful for the virtual and augmented reality (AR). 'Localization' and 'Mapping' are the prominent elements of SLAM. The device tries to simultaneously localize – find the location of some object with reference to its surroundings – and map the layout and framework of the environment that the device is present at. This can be implemented using a range of algorithms that simultaneously localize and map the objects.

Working of it

SLAM is a problem of optimization. The device's sensors collect visual data from the physical world, so called the reference points and inputs to the machine. These points are used by the device for distinguishing. Advanced SLAM technology is used by the Google's AR platform. When the device moves, the measurements are taken continuously, and the inaccuracies are regarded as 'noise' in the SLAM technology. Different sensors use different algorithms. Mathematical and Statistical algorithms are used in the SLAM technology, one of which is the Kalman filter. The Kalman filter, instead of taking just a single one input, it takes a series of measurements as the input. Then the prediction of the position of unknown variables is done. Grippingly, the Kalman filter also works in modeling the central nervous system – for sensory estimation and motor control.

Why is it necessary

A complex array of algorithms, computations and sensory inputs to go through a new or unknown environment. SLAM enables the remote creation of Geographic Information System (GIS) data in situations where the environment is too dangerous or small for humans to map.

SLAM has many Augmented Reality (AR) applications. When virtual content reacts rightfully with real objects within the surroundings, Augmented Reality is a success!

Heat Map

A heatmap gives the random distribution of pixels of the image. It uses the system of color-coding for the graphical representation of data. It is used in the different forms of analytics.

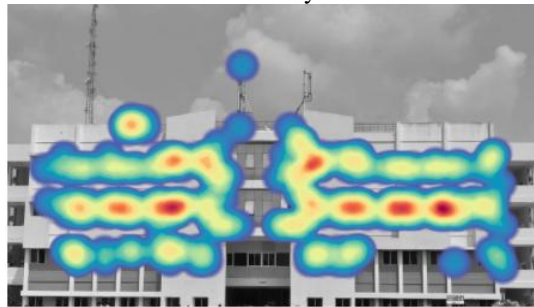


Figure 3: Heatmap of Block-II

The above figure describes the heat map of Block of Computer Science and Engineering of Sreenidhi Institute of Science and technology.

VIII. IMPLEMENTATION

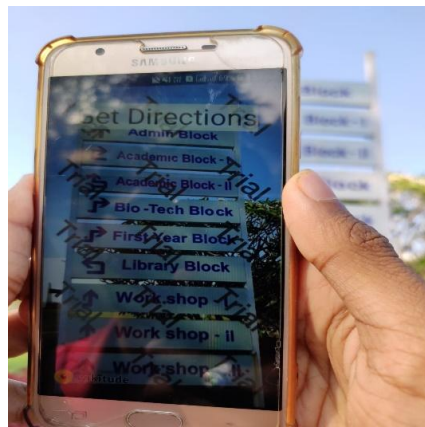


Figure 4: Starting board of SNIST

The above figure shows Starting guide of SNIST(Sreenidhi Institute of Science and Technology) from where you can know to different blocks in the college. When clicked upon it the redirects to <https://snistsoma.blogspot.com/2019/10/starting-guide.html>(We get the watermark of “Trail” as it is a trail version of this software)



Figure 5: Board of NCC

The above figure shows the board of NCC when clicked below will redirect us to the NCC Website of SNIST(Sreenidhi institute of Science and Technology).Link it will be navigated to is <https://www.sreenidhi.edu.in/pagecontents.php?catid=13&scatid=342>



Figure 6: Department of HealthCare and Transport

The above figure shows the department of Transport And Health center of SNIST(Sreenidhi Institute Of Science and Technology). When clicked upon Stethoscope it navigates to this blogger website (<https://snisthealth.blogspot.com/2019/10/health-related-data.html>) and when the picture of busses is clicked it navigates to this blogger website (<https://snisttransport.blogspot.com/2019/10/transport-related-data.html>)



Figure 7: First board of SNIST

The above figure shows the First board of SNIST(Sreenidhi Institute of Science and Technology) which redirects you to the SNISTwebsite. Link to which it navigates is <https://www.sreenidhi.edu.in/>

IX. RESULTS

3d model



Figure 8: Students parking board

The above figure shows the 3d model of car which is placed the student's parking board where it indicates that mostly cars must be parked over there.

Image Augmentations



Figure 9: Block-II(CSE Block)

The above figure shows the Block-II(Block Of Computer Science and Engineering)of SNIST(Sreenidhi Institute of Science and Technology).

On click Functionality of Augmented images

PROFESSORS NAME	CABIN NO
V.V.RAVIKIRAN	SNIST 2203SF SYS01
NVS SUBBAREDDY	SNIST 2203 SYS02
M.SATYANARAYANA	SNIST 2203 SYS03
K.DAMODHAR RAO	SNIST 2203 SYS04
DR.SUMA	SNIST 2214A SYS01
A.SRINIVAS REDDY	SNIST 2214A SYS02
DR.VIJAYA SARADHI	SNIST 2214A SYS03
DR.NIRANJAN KUMAR	SNIST 2214 SYS04
DR.SRIDHAR BUKYA	SNIST 2310V
R.SAI SINDHU TEJA	SNIST 2310W
G.KALYANI	SNIST 2310W
K.KRISHNA JYOTHI	SNIST 2310W
N.KIRANMAI	SNIST 2310T
V.GEETHA	SNIST 2310T
DR.NARAYANA RAO	SNIST 2310G
DR.SHIRISHA	SNIST 2310F
D.SRILATHA	SNIST 2310F
DR.SAHOO PRASANTH	SNIST 2310S
D.RAMBABU	SNIST 2414 SYS01
N.V.SURYANARAYANA REDDY	SNIST 2414 SYS02
T.MAMATHA	SNIST 2414 SYS03
S.DHEERAJ	SNIST 2414ASF SYS04
S.CHANDRA SEKAR	SNIST 2414 SYS05
A.CHANDU NAIK	SNIST 2414 SYS06

Figure 10: Details of Lecturers

The above figure shows the information about names of lecturers and their respective cabin numbers which is shown below in the following link clearly (<https://snistsoma.blogspot.com/2019/10/block2.html>)
Output Screens

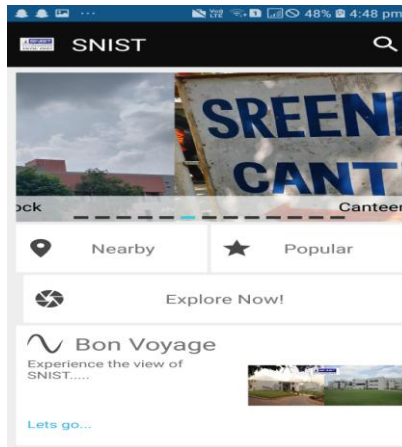


Figure 11: Starting screen of the Application

The above figure shows the first screen of the application it consists of Nearby, Popular and Explore Now tabs!

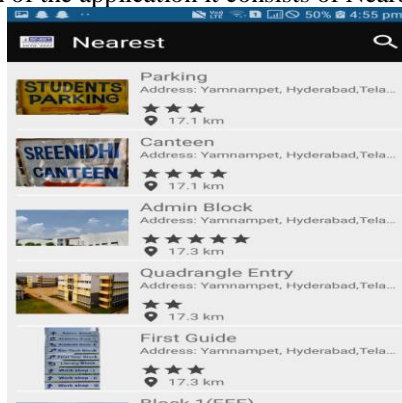


Figure 11: Nearest places are shown

The above figure is shown when the Nearby tab is clicked which shows all the nearest places from the current location

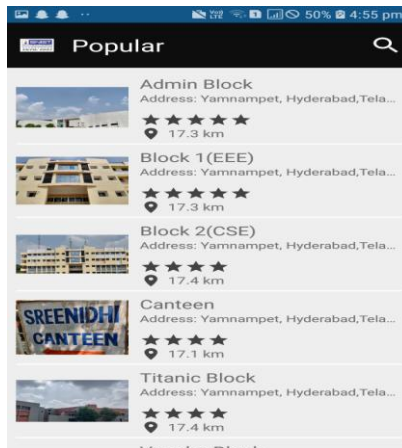


Figure 12 Popular places are shown

The above figure is shown when the popular tab is clicked which shows all the highly rated places from the current location.

The above augmentations are applied for different block Pictures and boards in our college.

They provide a good user interface and people explore the entire college with the help of these boards. Based on their navigation in the college, when people hit the boards which have the on click functionality the corresponding blogger site or any website is opened. The Blogger website usually contains the set of blogs where each blog contains the information about each block. The information contained here is the data related to giving directions, blocks and regarding the lecturers and their respective cabin numbers. Blogger is the best choice of usage In order to change the information dynamically. The information might change at real time so the data in the blogger can be changed at the user's point of interest. When the Explore Now! tab is clicked the Wikitude camera is opened which is used for augmented reality. The other two tabs are nearest tab and popular tab. The nearest tab when clicked upon will give us the output of the places in the form of list view that are nearest to the user based on his location. The popular tab when clicked, we get the list view of places based on their rating which are nearest to the user based on his location. Wikitude studio provides the access to the 1000tokens/pictures for free.

X. CONCLUSION

In conclusion, we want to say that the same thing can be implemented for tourism in India. And a lot of revenue can be generated easily. The implementations shown above may be utilized in the same and we can do it for all the heritage sites and improve the user interactivity and make the most of it. Already projects on augmented reality have started to come and this one of such application of the project where there is a lot of future scope for luring the tourists and it is mutually beneficiary. Students of our college were amazed to look at the virtual effects and similarly it is going to be a great success at larger platform, that is at both the state and country level.

XI. REFERENCES

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