Augmented Reality based Virtual Tour Guide

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Abstract— The project is about Augmented Reality via location-based visualization and enactment on the Smartphone expedients. That is relatively because Smartphone comes overflowing with in-built sensors have full-fledged and become standard over past few years. This will be discovering the collaborating and interaction Location Based Services that Augmented Reality sanctions on Android devices. The use of mobile applications and improvement in mobile technology such as compass, GPS and accelerometer sensors are able to detect and determine the locality and direction of the device, location-based applications with AR views are possible. Augmented Reality combines the physical world with virtual, the combination of information in the user's environs in real time, the user interface techniques of demonstrating rich, natural information data of the real world. The Augmented Reality application which archetypally takes the image of the cohesive camera, setting location as a representation of the real world and project objects on topmost of this image to create the AR view. The research was commenced by discovering and revising non-fiction related area and current Augmented Reality application available on Android devices. There are huge numbers of Augmented Reality applications open and quick enlargement of Android smartphone devices has delivered an developed platform for the application of mobile Augmented Reality technologies. Evolving application will help the investigator explore the area while going from side to side about this technology. The aim is to cultivate a blend of location-based information and AR features by combination of both visual, map-based and non-map based features like live projection of a nearby ground-breaking on camera screening on mobile devices, developing free and open source software enlargement tools.

Key words: Augmented Reality, GPS, Location Based Services, Android, Tourism Guide

I. INTRODUCTION

Augmented Reality is so long that the reality program behind closed doors extensively in the experimental stage. But today, they have one thing that you can get the attention of the reach of the average user. The net change in the direction of this new application again - has led to the development of mobile computing. Despite the many limitations in the technical field is still large, the latest innovation for new ideas to implement in reality.

Importance of augmented reality technology supplied by a lot of research in the future. The current state of technology does not allow to fully exploit the potential of the so-called augmented reality. It performs each step in the direction of increasing as it approached the port of computing technology is ideal property. Also to accelerate the commercial nature of the application of technological competitiveness is one of the stages of development of add-ons.

The foremost goal of this proposal is to reveal the ability of augmented reality applications to intermingle with dynamic data by consuming basic web technologies such as HTML, CSS and JavaScript. However, in the project part of this thesis PHP another scripting language have been used. The final application is developed for a venue called Muzuris located in town of kerala. The application is for example used to showing upcoming events, getting direction to the venue and checking availabilities of ticket. The application retrieves data dynamically from a database and lets the user to interact with it.

In the earlier it has been a bit uncertain to conclude one occurrence as Augmented Reality (AR) or not. The excess of this doubt still lingers among the technologies developers. Eventually AR was first given a clear designation as being a variation of virtual environments (VE). Virtual Environment puts the user in a computer generated world by preventing the user from interact with the real world. Unlike Virtual Environment, AR add-ons the reality rather than replacing it. AR combines the real world with computer-generated information. Hence, Augmented Reality can be seen as a composite of real and virtual reality [1: 2].

A GPS enhanced travel expo application, which allows the users to participate in a self-guided tour of a specific zone. It will also display detailed statistics about specific features linked to their current point. Next Generation Location based services for mobile devices is a mobile computing application that affords statistics and functionality to users based on their geographical location. In addition to showing the nearby restaurants type of application, it contains some extra features such as pro-actively push only relevant statistics to users to help speed up decisions and activities, encourage sharing of location-based statistics such as photos and reviews generated by other service affords and users. Even though, the exact differentiation for a technology to be Augmented Reality is still not clear. Nevertheless, to categorize a technology as Augmented Reality:

- It has to combine real and virtual.
- It has to provide interaction and tracking of objects in real time.
- It has to provide real time data interaction.
- Provide recognition of images or objects.
- Operate in different environment and used in 3D environments.

Augmented Reality is an emergent zone in effective reality investigation. The world environs from one place to another us afford a wealth of statistics that is problematic to duplicate in a computer. This is demonstrated by the worlds used in virtual environs. Moreover these worlds are very one-dimensional such as the environs generated for immersive amusement and games, or the structure that can generate more accurate environs has a million dollar worth tag such as aircraft simulants. An augmented reality structure engenders a merged view for the user. It is a permutation of the real

prospect viewed by the user and a virtual prospect generated by the computer that augments the prospect with auxiliary statistics. In all the solicitations, augmented reality manageable to the user enriches that person's performance in scene of the world. The ensuing goal line is to hypothesis a structure such a way that the operator cannot state the dissimilarity between the physical world and the virtual escalation of it. It illustrates the reintegration and correct process of data from a pre-operative imaging learning onto the patient's skull. On condition that this view to a surgeon in the operating theatre would boost their performance and probably exclude the need for any other regulation fixtures during the process.

The process of superimposing digitally rendered images onto our real-world surroundings, giving a sense of an illusion or virtual reality. Recent developments have made this technology accessible using a Smartphone.

Augmented reality is veiled content, most recurrently veiled behind marker images that can be encompassed in print and motion picture media, as long as the pointer is displayed for a appropriate length of time, in a steady point for an application to identify and analyze it. Based on the content, the pointer may have to remain evident. It is used currently by promoters where they generate 3D image render of artifact, such as a bike, or hokey boot, and generate this as an intersection to a pointer. This will allow the consumer to visualize 360 degree appearance of the artifact. Based on superiority of the augmentation, this can go as outlying as stipulating the estimated mass of the item, and allow the purchaser to wear the item, as viewed through their cell phone. Unusual setups include printing out a pointer and holding it before a webcam involved to a computer. The appearance of the pointer and the circumstantial as seen by the cam is showed on display, allowing the consumer to place the pointer on spaces such as the cheeks or move the pointer to control a personality in a game.

The use of mobile applications, identifying phone camera and often see the bar code clarity in black and white. The software analyzes the points and tied a virtual image on the phone screen, the camera focus. This means that the application works with the camera to explain the angle and distance of the phone is made. Since the calculation of the number of phone tag or image delivery method should, often with only a smartphone augmented reality support successful. Do you have a camera phone, and the data is not stored in the AR application, a good 3G Internet connection inside.

II. LITERATURE SURVEY

Combining guided guidance technology design and implementation of a world cultural heritage of the AR access. Augmented Reality application is based on the purpose of the video until the user base, including all the historic buildings in the town road three-dimensional animation. In most important buildings of the city represents boards and model design and high cavity to history, culture and tourism in the World Heritage city Museum two caves [1]. Introduced interactive visit Sri Lanka every year in popular tourist destination that receives a large number of visitors bases. Visitors printed instructions during the visit to find points of interest. Due to lack of information and support for the latest navigation features, visitors can visit all the places of interest to visit. Find a solution based on our research, and in this case offers comfort and improve visitors [2]. Augmented reality or AR is a new technology; it is the perception of real-time environment using information generated by the computer, such as images, text or sound and to show that the screen is improved. Recommended that the application is based on the Android mobile application is compatible with all current and future versions of technology [3]. The use of virtual tour viewer environments such as archaeological systems of knowledge and information, the purpose of the new foundation. And the development tools, add functionality through various scripts, in particular for the public is transformed into true 3D interface [4]. Apart from the consumption of augmented reality applications on behalf of tourism. It designates the enlargement of initial mobile applications commercial applications of this technology. We develop mobile AR application can put more attention to the reality of higher and technical experience brands [5]. Increased project with reality, they have generated a strong competition between companies in a number of difficult technological advances around the world in which every company trying to attract customers using different technologies. A latest technology augmented reality (AR). RA is a new technology that could make it difficult to forego the possibility of other technologies and measurement [6]. According to reports, no new method described in any way change the paper file paper documents in electronic information. All printed material on the market and the application of computer files sent, a technique referred to our paper augmented reality to improve map usability [7]. Inclusive application time machine that allows users to explore key localities in the region or experience the virtual environment of the voice guidance and access to information (visual and auditory) along the way. Evaluation of the program design and preliminary results are presented in an urban environment [8].Virtual content to see the real-world scene is integration design more and more interaction in the field. As personal mobile devices can increase the ' emergence of interesting reality environment, it has begun to explore the huge potential of AR [9]. Augmented Reality (AR), which consists of many regions of information technology, which is considered great ethnologist reality mixtures can greatly help us to communicate not only with a change of the equipment and the actual environment around us, so like the others. Augmented reality technology is used in education for military use, health, conservation, architecture and urban planning, tourism, entertainment and other programs [10].

III. IMPLEMENTATION

Next, more details of how to implement functions will be accessible. Firstly, a component diagram will be accessible and it describes all the components used in the solution. Then, will present implementation of functions of the city guide in the consistent components names as the Component Diagram.

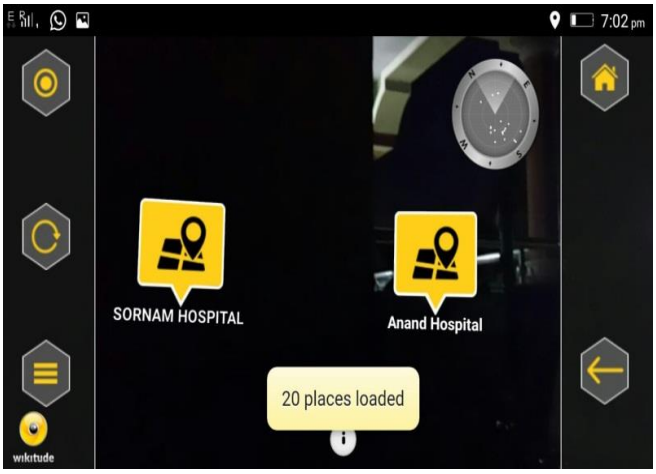

Fig. 1:

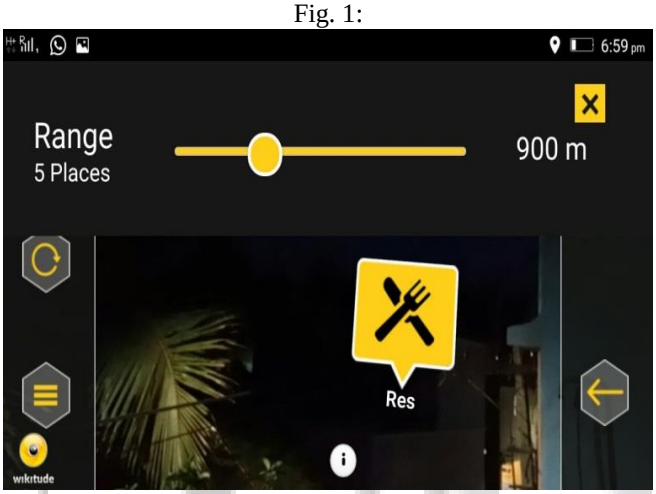

Fig. 2:

Above shows implementation of the GeoObject Class. It shows the image of the venue as a GeoObject and the texts under the image are the result of the enterFOV() function.

Another method which is triggered when the GeoObject is not visible on the camera view is exitFOV(). When this function executed, another text message will be dis-played. Events can be of any sort, in this project utilisation of text messages is done just for demonstration purposes.

The other part of this page contains a text with the value of a distance between the user and the venue. This distance is calculated using the distanceTo() function and the following code.

var dist =
(Math.round(myGeoLocation.distanceTo(L5)))/1000;

The code above shows implementation of distanceTo() function which calculates the distance between myGeolocaion and L5.and return the distance in meters. Math.round() is used to round up the decimal points and division in 1000 is applied to convert the rounder up result in kilometers.

Figure 10 illustrates the distance of a user who is 0.34km away from the venue. Without using distanceTo() function to calculate the distance between the two localities, the same result would have been achieved by implementing the Haversin formula.

$$a = \sin^2(\Delta\varphi/2) + \cos(\varphi 1).\cos(\varphi 2).\sin^2(\Delta\lambda/2)$$

$$c = 2.a\tan 2(\sqrt{a}, \sqrt{(1-a)})$$

$$d = R.c$$

Where:

- φ is altitude
- λ is longitude
- R is earth's radius(R=6,371Km)
- d is the required distance

Result: In the first case the user was able to access all the functionalities of the application and everything worked as it should. However, there was a delay in retrieving the dynamic data. This could have resulted in less processing power of the mobile phone and the speed of mobile data roaming. It was noticed that after the data was loaded for the first 35 time, the delay in retrieval the dynamic data was not experienced, when the application was used for the second or the third time. In the second case the user was located at the border and was able to access all the application's functionalities. No problems were experienced.

IV. Conclusion

Augmented Reality technology has come to a point where it can be utilized in anyone's daily activities. Since the technology is still on its early stage, it can open doors to many possibilities in the future.

During the actual development phase of the application there were no serious problems. Since the company who published the implemented ARchitect library is constantly updating it. This could enable application developers or content publishers to incorporate countal functionalities into their applications.

The main goal of this project was to demonstrate the capability of an augmented reality application to interact with a dynamic data by developing the AR application using simple web technologies such as HTML, CSS and JavaScript.

V. Future Work

Augmented reality is additional step added into the digital age as we will soon see our environs change enthusiastically furthermore through a Smartphone, glasses, car windshields and even windows in the nearby future to show augmented content and media right in front of us. This has marvellous applications that can very well allow us to live our lives more industriously, more safe and sound, and more informatively. Maybe in the future, we will see our environs become augmented to display statistics based on our own interests through built-in RFID tags and augmentations being implemented through holographic projections surrounding the environs without a use of an enabling technology.

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REFERENCES

[1] Eulalia Rodríguez Fino*a, Jorge Martín-Gutiérreza, M. Dolores Meneses Fernándezb,Enrique Armas Davarac 2013 International Conference on Virtual and Augmented Reality in Education 2013 International Conference on "Virtual and Augmented Reality in Education Interactive Tourist Guide: Connecting Web 2.0, Augmented Reality and QR Codes".
[2] M.U.E.Wijesuriya, S.U.Mendis, B.E.S.Bandara, K.P.Mahawattage, N.Walgampaya, D. De Silva "INTERACTIVE MOBILE BASED TOUR GUIDE", SAITM Research Symposium on Engineering Advancements 2013.
[3] Mr. Raviraj S. Patkar, Mr. S. Pratap Singh, Ms. Swati V. Birje, Volume 3, Issue 5, May 2013 ISSN: 2277 128X , International Journal of Advanced Research in Computer Science and Software Engineering Research Paper, "Marker Based Augmented Reality Using Android OS"
[4] M. Kochi, N. Brigand International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XXXIX-B4, 2012 XXII ISPRS Congress, 25 August – 01 September 2012, Melbourne, Australia, COMBINATION OF VIRTUAL TOURS, 3D MODEL AND DIGITAL DATA IN A 3D ARCHAEOLOGICAL KNOWLEDGE AND INFORMATION SYSTEM
[5] Chris D. Kounavis1,*, Anna E. Kasimati2 and Efpraxia D. Zamani1, International Journal of Engineering Business Management "Enhancing the Tourism Experience through Mobile Augmented Reality: Challenges and Prospects".
[6] Abrar Omar Alkhamisi, Muhammad Mostafa Monowar, International Journal of Internet and Distributed Systems, 2013, 1, 25-34, "Rise of Augmented Reality: Current and Future Application Areas".
[7] Jonathan J. Hull, Berna Erol, Jamey Graham, Qifa Ke, Hidenobu Kishi, Jorge Moraleda, Daniel G. Van Olst, 17th International Conference on Artificial Reality and Telexistence 2007 Paper-Based Augmented Reality Ricoh Innovations, Inc., California Research Center, Menlo Park, CA, USA hull@rii.ricoh.com.
[8] Kirsten Rassmus-Gröhn, Delphine Szymczak, Charlotte Magnusson "The Time Machine – an Inclusive Tourist Guide Application Supporting Exploration".
[9] Mehdi Mekni Andr´e Lemieux "Augmented Reality: Applications, Challenges and Future Trends" University of Minnesota, Crookston Campus TANYT, Quebec (QC), Canada mmekni@umn.edu ALemieux@Tanyt.com.
[10] Damala a, b *, Marchal a, P. Houlier a XXI International CIPA Symposium, 01-06 October, Athens, Greece "MERGING AUGMENTED REALITY BASED FEATURES IN MOBILE MULTIMEDIA MUSEUM GUIDES".

