

Public Facilities Location Search through Augmented Reality

¹Ms. PramilaShinde,Professor ²Lalit BhaskarPatil, ³Vikas SuryamaniShukla and ⁴Amol Laxman Bamane,
^{1,2,3,4}IT Department, Shah and Anchor Kutchhi Engineering college, Chembur, Mumbai, India

Abstract: Augmented reality, an emerging technology to identify an object visually and overlay the information about the display screen over the picture of a real image. With the help of GPS devices, users are able to identify their current location when there is line of sight with the help of satellites. The aim of our project or application is implementation of augmented reality concept using mobile device with the help of GPS navigation and providing other additional features. Our project is about implementing virtual Reality on android platform on augmented reality. Our app uses GPS system to track the current image streaming from mobile device and locate various checkpoint from available data source. With the implementation of augmented reality to find distance from current location to destination using available data sources and updates google maps.

I. BACKGROUND STUDY

Augmented reality (AR) is a live direct or indirect view of a physical, real-world environment whose elementsAugmented by computer-generated sensory input such as sound, video, graphics or GPS data. The identification of the object relies on pattern recognition. This technology requires huge database of patterns and computing power to identify the entity. Augmented Reality adds layers of digital information – videos, photos, sounds – directly on top of items in the world around us with the camera and sensors in a smart phone or tablet, thereby connecting us with more meaningful content in our everyday life. The concept allows the user to see the real world with additional digital information layered on top of the current visual of the real world when he/she sees it. They can understand the physical world around them. This technology can be applied in broad range of fields to ease our day-to-day activities. It is being used in many fields like military, medical industry, museums etc. Identifying a location, which is either in indoor or outdoor environment, is probably one of the perfect fits where augmented reality is applicable. Many location identification solutions are available nowadays for outdoor locations and are limited to popular monuments. The data required for outdoor location identification are provided by public databases. Localized entities such as rooms in the building, shops in the mall, booths in exhibitions, terminals in airports, sculptures in museums, are not captured in public/global databases. These spaces lack a proper location identification mechanism. Even though there are a few

indoor location identification mechanisms available they are not user friendly.

II. INTRODUCTION

With the advent of GPS gadgets, users are able to identify their current location when there is line of sight with satellites. There also exists hybrid approach of using GPS system and augmented reality, where GPS is used to identify the location in an uncovered open space and augmented reality displays corresponding meta-data about the location. A large number of mobile applications are available in market today to know the facts about a public place or popular historic spots. These applications make use of the phone's digital compass and GPS details to display information about the current scene captured by the camera.

III. APPROACH

Majority of the people own smart phones. Smart phones have built in camera and can be used as a tool to find location. They are coming up with better processing capabilities. Smart phones are capable of supporting augmented reality due to the calculations a phone must do in order to render the images over the real-world entities. So, a Smartphone meets all the requirements of our approach to solve public facilities location search problem. Project uses google data source through which our solution is targeted.The solution is targeted to the users who have Smartphones.

IV. WORKFLOW

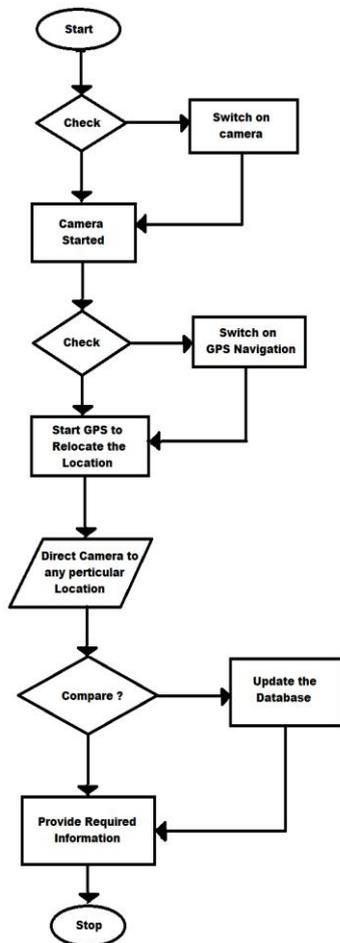
Step 1: Locations of interest have to be identified. Then open the camera to view thoseLiveview of locations.A location service is deployed which will help the mobile application to retrieve location details from the repository.

Step 2:The application extracts the location data from repository.

Step 3: The mobile application uses the camera of the mobile phone which points at a location. It continuously compares the information (direction, latitude and longitude) which is retrieved from google with the current visual.

Step 4: A part of the current visual may be equivalent to the images stored. If such matching pattern is found on a portion of the current visual, corresponding object's details are retrieved for rendering from the memory. The

information is rendered as an overlay at that particular portion of the current visual. That matched portion of the screen will display the location of interest. The information to be superimposed can be image, text, video or a sound clip which gives better description about the location of interest.



Step 5: The mobile application uses the camera of the mobile phone which points at a location. It continuously compares the images stored in the mobile device memory with the current visual.

Step 6: A part of the current visual may be equivalent to the images stored. If such matching pattern is found on a portion of the current visual, corresponding object's details are retrieved for rendering from the memory [6]. The information is rendered as an overlay at that particular portion of the current visual. That matched portion of the screen will display the location of interest. The information to be superimposed can be image, text, video or a sound clip which gives better description about the location of interest.

V. ADVANTAGES

The main advantage of this approach is better usability achieved by bringing in the ability to view the information of the location details living in closed environments.

Since the location service and location information system is hosted locally, any change to the location details can be done with minimal changes to the information source (QR code, RFID etc).

1. The location details and corresponding images are downloaded (if selected) and stored in the mobile device while the user scans the information source for the first time. This makes the location comparison easier for the mobile application.
2. No extra electronic equipment/ hardware are required to be fit inside the building.
3. The cost of implementing this solution is very low.
4. Enhances the user's perception about a location with rich user experience.

VI. LIMITATIONS

There are many challenges with the proposed approach of gathering location information in closed environments

- The main challenge comes with the storage of location images (If selected separately). The mobile gadget's memory can overflow when the storage of location images exceed its memory capacity. Too much occupation of memory space can bring down the performance of the mobile gadget as well.
- The visual comparison is highly dependent on the image captured by the smart phone. So the images captured must be of better resolution. High resolution images occupy more memory.

References

- [1] Ahmed El-Rabbany, "Introduction to GPS: The Global Positioning System", -Artech House, 2002
- [2] Stephen Cawood, Mark Fiala, "Augmented Reality: A Practical Guide" Publisher: Pragmatic Bookshelf Final Release Date: January 2008
- [3] Leeladevi, Rahul Raj, SeshuBabu Tolety - 'Indoor Location Identification with Better Outlook through Augmented Reality', Associate Software Engineer, Assistant Consultant, Consultant Siemens Technology and Services, Bangalore, India