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Visual Positioning based Real Time Mapping and Guidance System

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***Abstract*: Visual Positioning Based Real Time Mapping and Guidance System works with the help of geo-location, directional compass, and accelerometer mobile application that will show the location information over camera frame about focused direction. After scanning a particular area on camera frame the street view is enabled with pop-ups which will enable to get the information about the scanned area. The user will be facilitated with this information without the need of any human help. Certain algorithms determine the real time location and position of the user holding a smart phone and accordingly, the pop-ups and directions are displayed.**

***Keywords*: Visual positioning, geo location, accelerometer, camera.**

1. Introduction

The future version of the Maps app will merge its traditional interface with a live camera view. With well-known problems about user must deal with when navigating an unfamiliar locale, even if you do have your smart phone on you. That's why an updated version of it is created called the Visual Positioning System (VPS)-way for folks to avoid getting lost when out and about. Rather than craning over your phone and hoping you're walking in the same direction as the blue Global Positioning System (GPS) dot, the camera can look at your surroundings and work it out for user. In the example, if a person walks out of a subway stop and they don't know where they're going, they simply hold up the phone and launch the camera. Lens will then identify where you're standing and compare it to database. Once the system has your position, an arrow overlay will pop onto the screen, telling you if you need to venture left or right.

The proposed system is to Design and Develop VPS (Visual Positioning System) where a mobile app guide user with the help of dynamic popup information about view user is seeing using mobile camera currently. The proposed system is inspired by Google technology for visual positioning system where with the help of geo location, directional compass and accelerometer mobile application will show location information over camera frame about focused direction. Over the past ten years, Global Positioning System (GPS) has found wide spread use in consumer vehicles.

However, due to the satellite links required for obtaining a positional fix, accuracy and robustness are sensitive to environmental fact or such as tall buildings, mountainous terrain or adverse weather. Recently, efforts have been made to improve on these issues by adding ground to ground communication channels, as used in Assisted GPS and Differential GPS. However, even these improvements are of limited use in difficult situations such as parking lot, and still rely on outside communication.

2. Problem overview and objectives

After reaching on a particular place you may answer the question, where am I? But can you always answer, what buildings does the location consist of? Visual Positioning System based Real Time Mapping and Guidance System can answer all these questions. GPS satellite can show you exact position on the earth any time, in any weather, no matter where you are! GPS technology has made an impact on navigation and positioning needs with the use of satellites and ground stations the ability to track aircrafts, cars, cell phones, boats and even individuals has become a reality. When this technology is used you may get to a place conveniently but what after that? Are you able to make out exactly what buildings are there at the respective place? Definitely, human help comes to rescue! Hence in order to make it easier to get the names of particular buildings or monuments after reaching on a location, our Real Time Mapping System will make a way out.

The main objective of this project is

- To guide the user with the dynamic pop-ups about the monument or any object he/she wants to locate.
- With the help of different sensor and some complex mathematical algorithms system can calculate the user position information.
- Send a query to database and fetch relative information about the object.

3. Material and methodology

A. High level design

- Main question is how it will happen,
- Location information
- Direction information
- Position information

B. GPS Device gives location information

Fig. 1. Location information

C. Magnetic Compass gives direction

Fig. 2. Direction information

D. Accelerometer gives mobile's position

Fig. 3. Position information

As you are moving in the street and you don't know exactly where you are standing. Then you just need to hold the phone in your hand and open the camera. As soon as you open the camera instantly a pop up will appear on your mobile screen indicating names of the tower, buildings when you move the camera in front of that particular building.

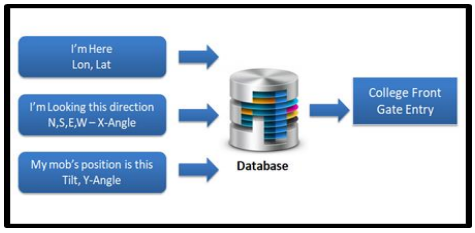

Fig. 4. High Level Design

Here we are using the sensor information, camera view and mapping view. Sensor is used to navigate the directions east, west, north and south. Camera is used to show the images. Mapping will give the information about source to destination If the user wants to find the factory from front gate, then the user will send the requirements like the directions and position to the database then database will fetch the requirements sent by the user and then it shows the destination to the user.

4. Scope

- This system can be used in various colleges where locating different buildings is difficult.
- Useful for locating departments within the building.
- Could be used in a campus having large area.

5. Conclusion

In essence, the complete working of this project could be explained as, a user is supposed to have a smartphone which has is GPS enabled and has a proximity sensor. The device used must work in synchronization with the direction, angle (pitch), location information. Whatever location (which is saved in the database) is queried when the particular building is scanned. The user interface is easy to understand. The appropriate information detected by the proximity sensors is to be evaluated and in accordance to that output is given in the form of a pop-up like message. The efficiency of the detection and output is completely dependent on the quality of efficiency a particular smart phone. Open the application, scan the area/building/ monument and get the information regarding the same on the screen.

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