IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES

ISSN PRINT 2319 1775 Online 2320 7876

Research paper Volume 11, Iss 4 , 2022

Enhanced global positioning system to increase the mobile phone localisation for medical emergency system

A.Roshini, V Bhavani

Department of Computer Science and Engineering,Koneru Lakshmaiah Education Foundation (KLEF), Vaddeswaram, Green fields, Guntur, Andhra Pradesh, India -522302

roshinicse22@gmail.com, vasanthabhavani@kluniversity.in

DOI : 10.48047/IJFANS/11/ISS4/129

Abstract

The GloCal shows promise in practicality, as evidenced by its 30% increase in GPS average accuracy. It operates in both large suburban and densely populated metropolitan regions using a prototype system called Glocal. In this effort, Google Maps is used to activate the system in case of an emergency medical issue. The application combines GIS and GPS to retrieve hospitals and specific locations of surrounding doctors. The system does not collect personal data; instead, it focuses on the time period for location tracking and notification. In this application, we develop and produce a highly accurate GPS-based global positioning solution that shows the user and driver the way. To increase the use of the Aadhar database in hospitals in the future and to offer.

Keywords: GPS, GIS, GSM/GPRS, Emergency Android App, Google maps, Thumb Impression.

1. Introduction

Road accidents and traffic risks have also increased due to the rising demand for autos. Because our nation lacks the best emergency facilities, many people's lives are in grave danger. Due to inadequate emergency facilities, road accidents have become more common since the introduction of technology, increasing the risk of traffic accidents and resulting in significant fatalities. This paper uses an Android application that detects accidents significantly faster and transmits the geographical coordinates—latitude and longitude—to a first assistance centre in a matter of seconds.

Together, geographic information systems and location-based services have ushered in a new era of mobile application development for a range of government and commercial uses. In contrast to the information services available today, such those on the web and as mobile apps, the GIS has significantly aided in the advancement of numerous computer-related professions. The super user can manage and keep up with a lot of data that is linked to digital maps using better database software. The data models for the subsequent elements—such as the storing, retrieving, and displaying of geographic objects—are provided by methods like computer graphics. Expertise in spatial data collecting, processing, and modelling, as well as modelling spatial processes for analytical purposes, is provided by geographic information science. Thumb impressions are utilised to access basic patient data, extending the use of the database (Aadhar—with future development) in hospitals and giving patients more flexibility.

2. Literature Survey

There are two ways to express a location: through text descriptions and geographical words. The mobile phone service provider network or satellites can both retrieve the device's position [1]. the capacity to obtain pertinent details about the location a user is searching for,

ISSN PRINT 2319 1775 Online 2320 7876
Research paper **© 2012 IJFANS. All Rights Reserved**, Volume 11, Iss 4 , 2022

accomplished through the usage of an Android mobile device equipped with a (GIS) GPS, Google maps, LBS, and LCS. LBS primarily performs two tasks: 1. determining the user's location; and 2. using this data to deliver a service [2]. As soon as the user's position changes, similar to a GPS device, their location will be updated.

Locating technology that helps determine a device's current location. By using location manager, we can check all available location providers, track our current location, track movement, and set proximity alerts for specific locations. The outcome demonstrated that a route had been found on a map connecting the source and destination addresses [3]. Initially, the Enugu urban area was selected as the study area due to its excessive population growth, which made it difficult to access healthcare facilities. ArcGIS 9.3 was used to perform the closest facility analysis and shortest path analysis to determine the quickest route to a healthcare facility [4]. With the use of the network analysis tools, the fastest path was ultimately discovered.

Initially, the study area was selected, and the PHC's road networks were plotted. ArcGIS software was used to assist with all of the digitization and analysis [5]. The network analysis was conducted based on the amount of time, distance, and speed that had to be travelled in order to reach the closest space. In order to prevent fraudulent and repetitive voting, a finger print scanner is employed to guarantee security. [6] Thumb impressions are used by the system in a distinct pattern to identify voters. Fig. 1 provides an explanation of the India death rate survey.

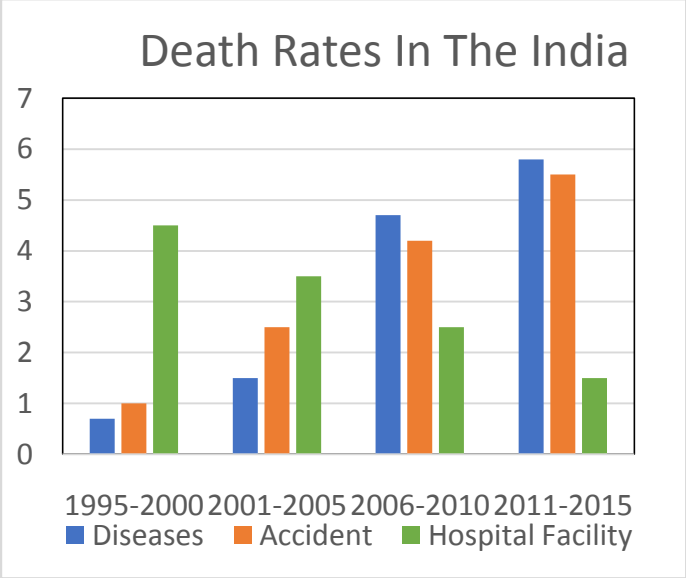

Fig.1. Survey of death rates in India

In 2015, there were over 3,37,000 fatalities from traffic accidents. Tamil Nadu had the highest rate of injuries from traffic accidents. The cities Bengaluru, Mumbai, Kanpur, Lucknow, Agra, Delhi (City), Chennai, Jaipur, Hyderabad, and Pune are in the top ten for the most road crash deaths [15].

2. System Overview

ISSN PRINT 2319 1775 Online 2320 7876
Research paper **© 2012 IJFANS. All Rights Reserved**, Volume 11, Iss 4 , 2022

The user of the current system must notify ambulance services and provide the desired location's specifics. The driver cannot see the precise location. The user is unable to look up the closest doctors' offices or hospitals [7]. The user can find information about the location they are searching for on numerous websites, many of which have portals. It will take longer for the information to appear on the screen if the user searches for a certain location.

ISSUES OF THE EXISTING SYSTEM

The proposed system is designed to provide users with convenient access to an ambulance through a user-friendly application [14]. By utilizing GPS technology, the user's desired location is transmitted to the server, which automatically identifies the nearest available ambulance driver. The location information is then forwarded to the driver's application. The functional representation of the proposed system is depicted in Figure 2.

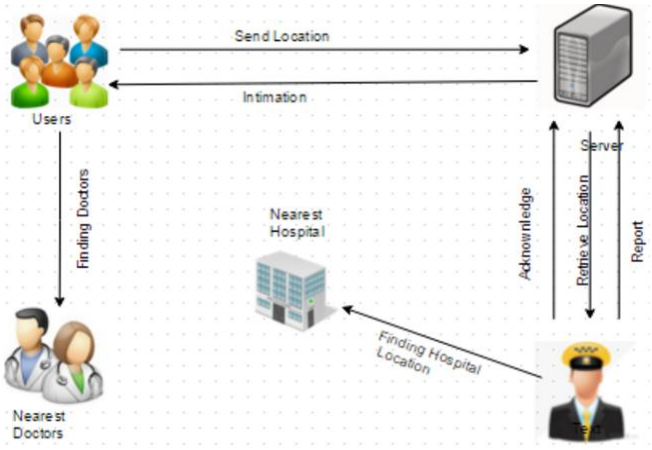

Fig.2. Functional Representation of System

The system will display a path to inform the user about the driver's location. Additionally, the system utilizes GIS (Global Information System) to provide the driver with information regarding the nearest hospitals and doctors [8]. This feature enables the driver to access relevant details easily.

4. System Description

The system's working process can be outlined as follows:

1. Location Sent to Server: The user's location is transmitted to the server.
2. GIS-based Nearest Search: The system performs a search based on the user's location to identify the nearest available services.
3. Location Retrieval from Deployment Server: The system retrieves the location information from the deployment server.

ISSN PRINT 2319 1775 Online 2320 7876
 Volume 11, Iss 4 , 2022

4. Navigation from Source to Destination: The system provides navigation guidance to the user or driver from the source location to the intended destination.
5. Report and Status Generation: The system generates reports and updates the status based on relevant information.
6. Data Retrieval via Thumb Impression: Data can be retrieved using a thumb impression as an authentication method.

These steps outline the sequential process of the system's operations.

Step 1: Sending Location to Server - Users can send their location to the deployment server using GPS (Global Positioning System). The GPS utilizes location services to determine the accurate position, which is then forwarded to the server. The device's classes support the applications that access location services [9]. The Location Manager System services, as a central component of the location framework, provides APIs to determine the device's location and bearing. To ensure precise depiction of users' actual trajectories, we combine the geocode results, which include latitude and longitude values.

Step 2: GIS-Based Nearest Search - The Geographical Information System (GIS) plays a crucial role in retrieving the nearest hospitals and doctors. By employing the k-nearest algorithm and leveraging the Google Places API, the GIS efficiently identifies the closest hospitals. GIS is a comprehensive system designed to capture, manipulate, store, present, manage, and analyze various types of spatial or geographical data. The algorithm is specifically designed to facilitate the retrieval of the nearest doctors and hospitals in a seamless manner.

Step 3: Retrieving Location from Deployment Server - When users send their location to the server using GPS (Global Positioning System), the server evaluates the latitude and longitude values received. These values are then forwarded to the driver's application. The driver's application retrieves the user's location from the deployment server, and the location is displayed on a map [10]. Simultaneously, the GPS estimates the desired location of drivers based on information received from the deployment server. Driver details are then passed back to the server. We anticipate that these results are enhanced by minimizing transformation residual errors, particularly for larger unit distances.

Step 4: Navigation from Source to Destination - After retrieving the location from the deployment server, a pathway is established from the source (user's location) to the destination (driver's exact location). Google Maps is utilized to create and display the pathway [11]. The Application Programming Interface (API) manages the interaction with Google Maps servers and handles the map display. A marker is placed on the map, making it convenient for both the user and the driver to identify the accurate location along the path.

ISSN PRINT 2319 1775 Online 2320 7876
Research paper **© 2012 IJFANS. All Rights Reserved**, Volume 11, Iss 4 , 2022

This map-based navigation system provides drivers with clear directions to nearby hospitals, effectively reducing their workload.

Step 5: Report and Status Generation - Reports are generated, including user descriptions and other relevant details, which are sent to the server for further processing. Once the server receives the user's location, it transmits the relevant information to the driver's application within the desired location [12]. If the driver successfully receives the user's location, the driver's details are then relayed back to the server. This process allows for easy retrieval and storage of specific data into the database.

Step 6: Data Retrieval using Thumb Impression - In order to enhance the utilization of the database (such as Aadhar in future enhancements) within hospitals and provide convenience to patients, thumb impressions are employed to retrieve basic patient information [13]. The thumb impression serves as a unique identifier required to access the individual's data from the database. This approach ensures that the patient's information can be efficiently retrieved and utilized when needed.

5. Conclusion

In conclusion, the GIS-enabled medical system discussed above incorporates various functionalities to enhance the efficiency and effectiveness of healthcare services. By leveraging GPS technology, users can send their location to the deployment server, enabling accurate tracking and mapping of their positions. The system utilizes GIS and the k-nearest algorithm to identify the nearest hospitals and doctors, ensuring prompt medical assistance. Location retrieval from the deployment server enables seamless communication between users and drivers, facilitating navigation from source to destination. The system generates reports and statuses, allowing for further processing and easy retrieval of specific data into the database. Additionally, the utilization of thumb impressions as unique identifiers enhances data retrieval, offering flexibility and convenience to patients. Overall, the GIS-enabled medical system integrates various components to streamline healthcare processes, improve patient care, and optimize resource allocation.

References

[1] Singhal, Manav, and AnupamShukla. "Implementation of Location based Services in Android using GPS and Web Services." IJCSI International Journal of Computer Science Issues 9, no. 1 (2012).
[2] Kushwaha, Amit, and VineetKushwaha. "Location Based Services using Android Mobile Operating System." International Journal of Advances in Engineering & Technology 1 (2011): 14-20.
[3] Rani, ChRadhika, A. Praveen Kumar, D. Adarsh, K. Krishna Mohan, and K. V. Kiran. "Location Based Services In Android." International Journal Of Advances In Engineering & Technology (2012).

ISSN PRINT 2319 1775 Online 2320 7876
Research paper **© 2012 IJFANS. All Rights Reserved**, Volume 11, Iss 4 , 2022

[4] Ejiagha, Ifeanyi R., Johnbusco C. Ojiako, and Chijioke G. Eze. "Accessibility Analysis of Healthcare Delivery System within Enugu Urban Area Using Geographic Information System." Journal of Geographic Information System 4 (2012): 312-321.

[5] C.Prabha,R.Sunitha,R.Anitha. "Automatic Vehicle Accident Detection and Messaging System using GSM and GPS Modem." International Journal of Advances in Engineering & Technology Issues 7, no. 3 (2014).

[6] Chenshuwu, Zheng Yang, Yu Xu, Yiyang Zhao, Yunhao Liu. "Human Mobility Enhances Global Positioning Accuracy for Mobile Phone Localizaion. " IEEE (2015).

[7] Shanu Agrawal, Pradeep Majhi, Vipin Yadav." Fingerprint Recognition based Electronic Voting Machine." International Journal of Engineering &Technical Research.

[8] A.Xavier Raj." Saving lives through rural ambulance services: Experiences from Karnataka and Tamil Nadu states, India. " Transport and Communication Bulletin for Asia and the Pacific (2014).

[9] Jie Liu, Bodhi Priyantha, Ted Hart, Yuzhe Jin, Woosuk Lee, Vijay Raghunathan, Heitor S. Ramos. [11]"Co-GPS: Energy Efficient GPS Sensing with Cloud Offloading." IEEE (2015).

[10] Augusto Luis Ballardini, Lorenzo Ferretti, Simone Fontana, Axel Furlan, Domenico Giorgio Sorrenti. "An Indoor Localization System for Telehomecare Applications." IEEE (2015).