

Child Tracking System using GPS

¹Linda John ²Aiswaria S M ³Nourin Fathima K H

^{1,2,3}Department of Computer Science and Engineering

^{1,2,3}Albertian Institute of Science and Technology, Kochi, Kerala, India

Abstract

In the current scenario security of the children is very poor. This model helps the worried parents at ease regarding their child security. Our system ensures 24x7 tracking will be provided. This paper proposes a model to secure the child safety inside and outside the school premises through a smart watch and an android phone. The current location will be given to parent via SMS. The principal or the higher authority can fix the geofence.

Keyword- Global Positioning System (GPS), Geo-Fencing, Short Messaging Service (SMS), Child Tracking

I. INTRODUCTION

In the current generation we have reached a point where we can't live without the technology. Smart phones are becoming smarter each day, provides new features that makes our life much better. The safety of the child is going out of hand in the current world. The crime rate child molesting, kidnaping increased to a rate where it's hard handle them by the authorities. This paper discuss about how to prevent this to a rate that can be controlled. How we can use technology to prevent or decrease it to a level.

Today smart phones are the basic need of the user today, providing lots of features which make our life so simple and easier. This paper is focused with the safety of children. Today safety of the children is substandard. The proposed application is developed on android platform, the basic techniques required mentioned below:

- 1) Geo-Fencing
- 2) GPS (Global Positioning System)
- 3) SMS (Short Messaging Service)

Figure.1 represents the android application uses GPS and SMS services. GPS helps in locating the child's location by using Google maps.



Fig. 1: Contents of Application

This application makes sure that the current location of the child will be tracked and shown to the parents along with the distance from current location to the school. SMS services works when there are no internet services. Google Maps help the parents by sending the current location of the child without their knowledge. When they are outside the fence, an alert will be given to the parent's phone and the distance from the school will be calculated within seconds. Once they are in danger zone the nearest police stations will be displayed on the map.

In this application admin are able to create a Geo-reference boundary according to their choice. This application uses Google maps API to show location on map.

II. LITERATURE SURVEY

A. Design and Implementation of Automatic Child Monitoring (ACM) System using Wireless Network

In this literature survey the paper is aiming at the increasing security risks of children and implements a kind of child monitoring system based on android phones to help guardian to acquire whether children are safe or not. ACM implements the software hand function as well as the danger zone function. The software hand function can monitor the child's regular activities and the safety

zone function can make guardians know children's location timely by using GPS sensors, acceleration sensors, and mobile GIS (Geographic Information System).

ACM is mainly composed of three block functions, the child unit will be attached with the child dress, the school unit will be available in the school for the database maintenance of each and every student in the school and the home unit will be with the parents which is used to find the location of the child in a cases if the child is missed in some crowdie places like park, mall etc..,

The school unit block maintains the child databases. It consists of RFID reader which is used to read the RFID card available with child. With this card only the student availability is maintained. The home unit block is available with the parents. It helps to activate the GPS module manually and find the location of the child, if the child is being missed in any places.

The child unit will be attached with the child. It consists of RFID card, GPS module which is used to find the location of the child if the child is being missed in crowd areas like park, mall, shopping complexes, etc..,

B. Application of Geofencing Technology for the Purpose of Spatial Analyses in Inland Mobile Navigation

In this literature survey paper we analyse Geofencing technology in inland mobile navigation systems. Paper describes implementation issues related to proximity analysis used for safety and informational purposes with the usage of geofences. This includes generation of warnings and alarm messages when approaching to navigational hazards. The characteristics of spatial data management in mobile on-water navigation systems are presented.

A Geofencing system tracks user location and triggers events when entering or leaving any of given area. The location is usually determined using GPS receiver, but Wi-Fi network based location. The MOBINAV application uses Geofencing to warn the people on board about the surrounding places that need caution. MOBINAV application is a GIS solution. It consists of core vector data objects grouped in layers with a defined set of attributes for each class.

Additional raster data exists only as additional informational layer and do not spatially cover the whole area represented by vector data. Objects geometry or attributes grouped in core layers cannot be modified, but new dynamic layers may be created, e.g., for analyses purposes and even shared among different users. Moreover, all dynamic information about on-going traffic (ships positions) or existing alerts and warning is represented as additional layers.

The MOBINAV application uses Geofencing to perform proximity analysis between own ship and specified other map objects to inform users when they enter some zone in which they should take caution. Geofences can be built around any point object in created buffer layer. Different kinds of geofences are created in separate classes. The demonstration version of application is built as universal windows application, which works on all Windows 10 devices: Smartphones, tablets, notebooks, etc. and therefore uses its Geofencing API.

C. Design and Implementation of a Children Safety based on IoT Technologies

In this literature survey paper, a system for increasing children's safety is proposed. The main focus is on the daily route from home to school and vice versa, assuming the use of school buses. IoT paradigm is exploited together with various localization techniques i.e. RFID and GPS, in order to design a solution for parents willing to make certain of their child's following the main steps to school or home, i.e. taking the school bus and entering school or leaving school and entering the school bus. In this paper the applicability of RFID technology efficient tracking capabilities is tested in children's tracking and monitoring during their trip to and from school by school buses.

GPS is a navigation system used to provide time and location information by the use of GPS satellites in all weather conditions. Each GPS satellite continually sends a signal (carrier frequency with modulation) which includes a pseudo random code (sequence of zeros and ones) that is generally known at the receiver side. By aligning with time a receiver generated version of the code and receiver measured version of the code, the time of arrival of a defined point called an epoch, is found in the receiver clock time scale. Time of transmission of the code epoch is included in the message (in GPS time scale) and satellite position at that time.

RFID technology is an advancement of the barcode. The main difference between RFID and barcode is that RFID can scan a large number of items at the same time whereas the barcode can scan only one item at a time. RFID is an automatic identification system consisting of two types of elements: readers and tags. A tag has an identification number (ID) and a reader, which recognizes an object through consecutive communications with the tag attached to it. RFID has the potential to enable machines to identify objects, understand their status, and communicate and take necessary action.

III. RELATED WORK

The system uses client server model architecture. The application was implemented in JAVA enable mobile devices which support GPS. Firstly the application works on two modules first for parents and the second one is for children, only the parent will use the smart phone and the child will be given a handheld device. Parents can monitor their child moment as per their choice as they are receiving the reports of their child movement from their devices.

A notification will be given from the system when the child crosses the Geo-fence boundary. The wireless device sends the location coordinate by using GPS updates to the server and updates the data in the server. The parents can view their child's location in the map.

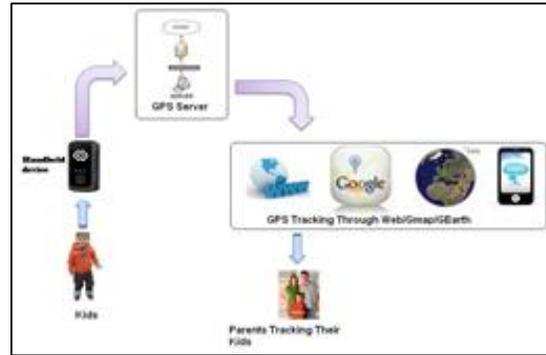
IV. SYSTEM DEVELOPMENT

Development of this application requires a GPS enabled smart phone which will be used to track the child. Tools like Android SDK, eclipse are used for android application development.

A. Application Development IDE

Android is software for mobile devices that includes an Operating system, middleware and key application. The SDK supports several different integrated development environments (IDE) but we selected Eclipse because it is the best IDE integrated with the SDK no matter which operating system we use.

B. Application Architecture



GSM and GPS play an important role this paper. There are two main services that are GPS and SMS. For location tracking: GPS and telephony: SMS.

C. GPS

GPS is a multiple-satellite based radio positioning system, in which each GPS satellite transmits data that allows user to precisely measure the distance from the selected satellite to its antenna and to calculate position, velocity and time parameters to high degree of accuracy. GPS delivers with a high sensitivity and accuracy with low power consumption. GPS module design is flexible to accommodate a various RF interferences.

GPS consists of 3 segments

- 1) Space Segment: It is the number of satellites. The function of the space segment is utilized to route or navigation signals and to store and retransmit the route or navigation message sent by the control segment.
- 2) Control Segment: It is also referred to as monitor station, which monitors the child lively with the help of monitor stations.
- 3) User Segment: It comprises of the GPS receiver, which receives the signals from the GPS satellite and determine how far the child is away from the parent.

The GPS module works on the basis of trilateration mathematical principle. The position is determined from the distance measurements to satellite. The GPS consists of satellite, control station, monitor station and receiver. The GPS receiver takes the information from the satellite and uses the method of trilateration to determine the child's exact position.

D. Geofencing

Geofencing is a technology that allows objects' location monitoring in a specified area. There are many applications of this technology in e.g. marketing (messages sent to possible clients, if are in a specific distance from a shop), fleet or asset management (alerts of route or placement changes). The basic concept is that for a specified set of regions, a geofencing system tracks user location and triggers events when entering or leaving any of given area. The regions can have any shape, but usually only circular geofences are implemented. Geofencing is as accurate as location accuracy provided by used sensors; either builds in the mobile device or connected externally. The location is usually determined using GPS receiver.

V. LIMITATIONS

- 1) The device must be always with the child.
- 2) High battery consumption
- 3) Low signal
- 4) Inability to connect with the local Wi-Fi
- 5) GPS will not work with poor network
- 6) Unable to scene human nature

VI. CONCLUSION

Child GPS Tracking System helps parents for monitor their children and ensures child's safety. Some of the best works implemented in past relies on SMS based tracking which is not helpful to get an accurate location, but in our proposed system we have provided real time tracking. We have added Geo-fencing and Emergency messaging services to enhance the system. Whenever the child leaves the geofenced boundary an emergency message will be sent to the parent. And also if the parent wants to know the recent places visited by the child, they can see through this app. Therefore, we can conclude that this application provides solution for child missing and this paper takes the advantages of smart phones which offer rich features like Google maps, GPS, SMS etc.

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