

Iot Based Kids Tracking System

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ABSTRACT

Recently many cases of missing children between ages 14 and 17 years are reported. Parents always worry about the possibility of kidnapping of their children. This paper proposes an Iot and Android based solution to aid parents to track their children in real time. Nowadays, most mobile phones are equipped with location services capabilities allowing us to get the device's geographic position in real time. The proposed solution takes the advantage of the location services provided by mobile phone since most of kids carry mobile phones. The mobile application use the GPS and SMS services found in Android mobile phones. It allows the parent to get their child's location on a real time map. The system consists of two sides, child side and parent side. A parent's device main duty is to send a request to the child's device to get the location of the child. On the other hand, the child's device main responsibility is to reply the GPS position to the parent's dash board upon request.

Keyword : Iot GPS Kids Tracking

I. INTRODUCTION

In today's world, over 80% of the world population, including children around the age of eight or seven, owns smart phones. This is due to many reasons. One of them is the remarkable features and capabilities that new smart phones

offer especially Android based smart phones. With that many features, the need for resourceful applications rises. In our opinion, GPS offers outstanding capabilities in locating position and this can be used to develop resourceful application that helps in locating missing or lost children. Studies conducted by Cyber Travel Tips showed that in Malaysia, missing children are basically classified into two categories. The first category is disappearance, which includes running away from home. The other category is abduction or kidnapping. Statistics reveal that since 2004, a total of 5,996 children under the age of 18 went missing from their homes. Fortunately, around 4092 children returned home or found by the police. However, the other 1,904 children are still missing. Those children are boys and girls with ages between 14 years and 17 years. Moreover, when parents want to go family trip, they always concern about their children's safety. This worrying may affects negatively on the parent to enjoy their family trip. Even worst, parents can lose sight of their children and fear the possibly of kidnaping or worst for them. Consequently, this project is designed to be used by parents and aimed to help locating missing or lost children.

It takes advantage of the fact that many of today's children bring smartphones which is convenient for this kind of situation. In this work, GPS is combined with one of the basic service of a smart phone which is GSM, more specifically SMS, in one system. An application at the parent side will

allow parents to send a location request to a child side then retrieve the location from the request reply and shows it on a map. On the other hand, the application at the child's side gathers the necessary information of the smart phone that will be used to locate the smart phone. Information such as GPS coordinates and time are gathered and sent to the parent smart phone that's pre- registered on the application. The communication between the parent and the child applications is done using Short Message Service (SMS). SMS offers the system unique features. It will allow the system to work without the need of internet connection thus allows the application to be implemented on smart phones that don't support GPRS, 2G or 3G internet connectivity. The system sends the location of child's smart phone to parent's smart phone when the parent wishes to check on the child.

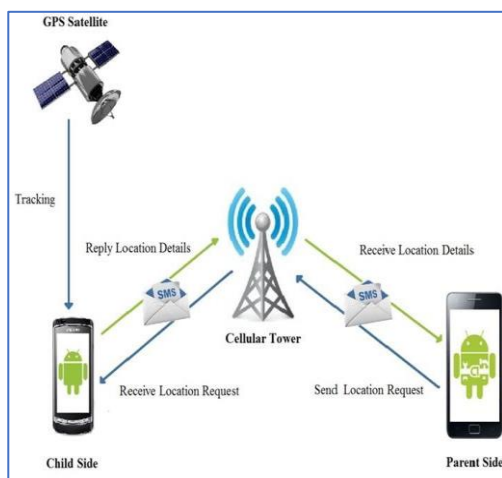


Figure 1 : Architecture of Proposed

II. LITERATURE SURVEY

The review of literature for child safety and location tracking devices are discussed below.

Al-Suwaidi and Zemerl [1] work states that the problem was solved by proposing an application "Locating Friends and Family Using Mobile Phones with Global Positioning System(GPS). The architecture of the system is based on client-server

approach. The client phone registers and login into the server. Then, the client periodically sends his coordinate location updates to the server which stores it in a database. Thus, any client wishes to learn the location of another client will have to register and login to the server to request the location. This application was developed to help locate family member and friends. The mobile application was implemented using J2ME. As for the server, it uses MySQL Database along with PHP to guarantee that the server would not be overloaded. This proposed solution makes each client has same control and command privileges as the other which is not convenient for use in child tracking application where only the parent should have the control and command privileges. A limitation of this solution is that in order for the system to work there must be internet connectivity in both client and server sides.

Almomani, Alkhalil, Ahmad and Jodeh [2] states that a "Ubiquitous GPS Vehicle Tracking and Management System" is proposed. This system architecture designed in a way so that it offers maximum accessibility for the user anytime and anywhere by providing two types of end user applications, a web application and a mobile application. The architecture of the system is based on client-server. In the server side, it contains a GPRS, a web and an SMS server along with database to store user details and data. As for the client, it is a

box that contains a GPS tracker and a GSM modem. When users request location from the web or mobile application after registering and logging into the web server, an SMS request will be sent to the GSM modem in client device. Then the client device responds using GPRS which will be received by the GPRS server and forwarded back to the SMS server. Finally the SMS server forwards the response to the web server. This project was designed for fleet operators in monitoring driving behavior of employees or parents monitoring their teen drivers.

Chandra, Jain and Qadeer [3] used a simple web server approach along with SMS to solve the problem. It was implemented for JAVA enabled mobile devices equipped with GPS receptor. A client can either send his location to other clients directly by SMS or share it by sending it to the web server's database via internet.

Clients can view the locations on the Google maps. The aim of this application is to enable the user to share his location with their friends or even who uses the same solution.

Anderson, Lustig, Brunette, Borriello and Kolko [4] proposed solution for "transportation information system" using only GPS and SMS. On the client side, a device (a box) containing a GSM modem and a GPS unit. On the back end side, a database server stores the details and locations connected to a basic GSM phone for SMS capability. When a user wants to request a location of a client, it sends an SMS request to the server's GSM phone, the server then replies with the latest location acquired from the client to the user issued the request. A unique feature of the solution is that it does not require internet connectivity on both sides for it to work.

In [5], the parent can send a message to the GSM module, according to the message information the GSM module replies back with particular details of the children. The location can be seen on the Google map. When a particular child is facing an emergency situation, device button should be pressed so that the device captures the image along with the user information to the enrolled mobile numbers. The life of the child can be saved within no time.

In [6], for the children point of view GPS, GPRS and GSM are used to monitor the speed and location tracking purpose. The system is fixed on the bus or car or in any vehicle so that the vehicle is going on routine route or not can be identified by the GPS tracker, the speed of the bus can also be extracted. Now-a-days the digital technology plays

a major role for connecting persons via internet. For tracking the children, the android based solution is provided to parents. Internet is the one that will connect different components through a single device and is connected to server. Parents track their children in real time of the location tracker by GSM.

In [4] the microcontroller used is ARM-7 LPC2148. In day to day scenario, missing child cases are increasing gradually. Child caring is a major issue. Different types of methods are introduced to find good solutions. There have been many Methods and systems implemented to solve it.

In [5], to solve child caring problem global position system (GPS) based solution with two nodes was proposed. In these two nodes, one node is child node which contains a Bluetooth module and a GPS receiver. The parent node consists of a mobile that supports Bluetooth. The location of the child can be tracked by the GPS technology and can be displayed on the designed map in the mobile device, through the Bluetooth connection the distance between the child and parent can be calculated. Children below six years can not explain in words directly to their parents about the problems, hence a wearable device is developed in [6]. This device procures information such as heart rate, physical body movements and send it to the parents in real time.

In [7], a wearable sensor badge is constructed from (hard) electronic components, which can sense perambulatory activities for context awareness. A wearable sensor jacket is used with latest techniques to form (soft) fabric. Stretch sensors are placed to measure upper limb and body movement. Worn as clothing, the sensors give the required information.

In paper [8], wearable IoT device for the security and shielding of women and girl children was designed. The body temperature and galvanic skin resistance of the body is changed in abnormal

conditions. This was used as input information and the alert signal is produced while it crosses the threshold value. This work deals with body temperature and stress, skin resistance and relationship between them. By applying these parameters activity of the person was analyzed. The device [9] an analysis of skin resistance and body temperature was made. Body position is determined by a triple axis accelerometer. After acquiring raw data activity recognition is done and a specialized machine learning algorithm is employed in this process. Real-time data is achieved by sending sensor data to a Cloud Platform. Then the data is analyzed using MATLAB. The jacket consists of different sensors for to detect the activity of the body.

In paper [10], there are two modules namely Wi-Fi and audio play back module. The details of the baby can be sent to parents through Wi-Fi module. The audio play back module produces the recorded sound different sensors are accelerometer sensor, cry sensor, temperature sensor gas sensor, flame sensor and PIR sensor. The embedded system consists of microcontroller accelerometer detects the angular position and movement of the baby. As it can be established from the literature review conducted, there are many exiting solutions for locating missing or lost children. Some of the above discussed solutions require internet connectivity on both sides of client and server which is not convenient for some cases where there is no internet connectivity at any of the child or parent sides.

Additionally, the relationship between the child and parents devices should be controlled by parent side. A child should not be able to delete or modify his details without parent's permission. Hence accordingly, we have assembled suggestions of approaches to solve child locating problem which led to propose a solution designed for any smart phone that supports Location Based Services including GPS. Unlike most of the systems discussed, the main feature of the proposed application is to get the child location

without the child's interaction in the process and with simple and cost effective's methods. This is done through the use of GPS and SMS only.

III METHODOLOGY

The algorithm for the proposed method is given below.

Step 1 – START

Step 2 – Declare the input out pins

Step 3 – Read information from GPS module and

Step 4 - Upload to customer server or blynk app

TECHNOLOGY OVERVIEW

The technology feasibility to the proposed system could be summarized as below.

Web server: Server which needs to execute continuously and serve client requests reliably, in this task Apache web server is utilized for this purpose which provides service at 8080 dedicated port, server has the potential to work concurrently and provide service to clients instantly, it works best on Linux platform as it is a multiuser operating system. This server executes the PHP programs efficiently.

Messaging: In the proposed system SMS are sent via GMS modem, AT(Attention Commands) commands are used to communicate with the modem each command is a alphanumeric code with predefined meaning and commands takes parameters.

Server Scripting: In the proposed system server side scripting is done using JSP language, the language supports both procedural and object oriented approach, it is flexible language as it supports variant data type, for each loop with key value concept which is very help full to navigate through arrays of different types.

Sensors: Are the electronic gadgets which sense the dirt dampness substance and ship off the base station.

ESP32 KIT: This unit gets the data structure sensors and converts the simple information to computerized; this information gets prepared utilizing C language and transferred to the worker utilizing Wi-Fi arranged organization.

Mobile Phone Tracking : Cell phones make life more convenient. So in cell phone tracking system, one small cell phone is given to each children with the help of which parents can call or message their child whenever they want, so they get detail information about the location and about the mood of child whether they are happy or not. But sometimes child may delete the call log and SMS details manually, for this all deleted data is saved in server. Also content of message and call log can be viewed by their parents even if their child changes the number. This system also provides GPS location of the child so that parents can track the location of the child and they can be alert if their child is moving outside of defined area. This system can also track the browser activities and provides call block and message from specific number. Besides this facilities in cell phones children between edges of 4-8 may get problem with operating and handling of cellular phone. Children between this age group have huge tendency of playing, so they may loosed cellular phone or they may not carry the cellular phone during play. In that case tracking of child activities will not be possible.

Breadboard: This gadget assists with interfacing different parts and structure circuit without patching, it has a matrix of interconnected attachments with which we can associate different segments needed for a project.

Wi-Fi organization: Data gathered from sensors should be transferred to a distant worker; it is finished utilizing a Wi-Fi organization, it is needed

to specify the side and secret key in the code to build up correspondence.

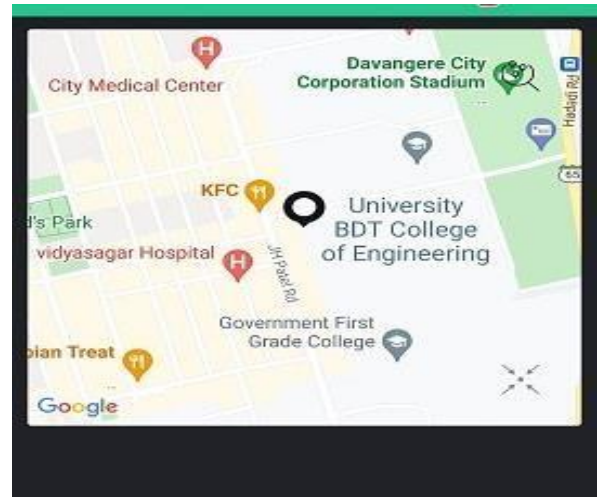


Figure 2 : Above screen shows the Location of the kid being tracked using Blyank app, which receives signals from GPS module.

This project of children security and tracking system using Bluetooth and GPS technology has been successfully developed. The result and analysis of the data obtained from the project testing have been carried out that this project has achieved the objective and the purpose of this project being developed. This device can help parents to track the location of their missing children. This device can send the alarm notification through the smartphone when the Bluetooth connection is lost. The GPS module gets the coordinate of the device and sends into the smartphone by using SIM900A GSM module. This GSM module can send the message that contains coordinate and link to the Google Maps. This device can be used easily to the parents to help them find the location of their children.

IV CONCLUSION

Parents especially who live in urban area, needed to work day and night to sustain the family which causes them cannot know where their child is going during the working hour. However, with the child tracking app, parent can track and monitor their child with just a simple app. The parent is not possible to always stay beside of children as most of the parents needs to go for work. By having this child tracking system, parents can track the location of their children. In order to avoid the kidnapping cases, the child tracking system is needed. This Child Tracking Device can be used to obtain the real time location of the child by parents. The location can be send to desired number of users. The alarm can indicate the discomfort of the child and the persons near them can help the child. This device uses SMS based technology so the parents are able to use it more efficiently. In future this device can be improved in battery life time. The camera can also be attached so that the accurate environment where the child lies can be monitored by the parents.

V FUTURE ENHANCEMENT

In future it can be extended to perform the same for all children in the school by reducing the size of the child module. It can be also extended by interfacing a camera to the child module and intimating the missing child or child cry information both to the parents mobile and to the police control room. Developing this project would not have been possible without studying related and existing works. Some of these works relies on internet connectivity or a server that has to be up running. The proposed system relies only on two main services, telephony and location, thus eliminating the need for internet connection or a dedicated server. Finally, like any software product or design, there is still room for enhancement. Features can be added to enhance the system such as Geo-fencing, emergency alerts and many others. The proposed

system will be implemented, continued, reviewed and improved in a later work. .In future playing out no different for all kids in the school by diminishing the size of the kid module can be expanded. It very well may be additionally stretched out by connecting a camera to the kid module and insinuating the missing kid or kid data both to the guardians portable and to the police control room. In this project was developed to aid locating missing or lost children. The solution proposed in this paper takes advantage of the rich features offered in Androids smart phones. The architecture of system built on two main component, GPS satellite, and GSM telephony services. Developing this project would not have been possible without studying related and existing works. Some of these works relies on internet connectivity or a server that has to be up running. The proposed system relies only on two main services, telephony and location, thus eliminating the need for internet connection or a dedicated server.

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Recognition using Deep Learning based Linear.