

# Child Tracking System - The C Tracker

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**Abstract--**The C Tracker is an intelligent application that ultimately aims for the prevention and protection against child abuse and to ensure their safety and security; especially for the school going ones. The most important part of the proposed system is a smart watch that ensures the safety and provides security to the child by using an SOS button. Also it keeps track the locations of the child for further verifications and references. The child application will send notifications to the parent application and to the saved official numbers that includes the location and picture of the child's surroundings in case of any trouble so that the associated ones can take necessary actions as soon as possible. The very important advantage of the system is that, the parent will receive alert message to their preset phone number even if the parent is offline. Also, the application provides the facility to send a pre-alert message to the saved numbers in case, if the child feels any source of insecurity.

## I.INTRODUCTION

Today, the abduct, harassment and sexual abuse of school-going children are increasing at a frightening rate. As a result of the case study done by an independent source, it is stating that around 20,000 kids are lost and trafficked annually in India. Living in today's society, there is a need of smart solution to this problem so that the parents might be able to know the information regarding their children. Here, in this project we have come up with a smart solution for this problem; The app named C-TRACKER. By this mobile app, we have covered all these aspects by using a special watch. The watch is provided with an SOS button located on the side of the watch, which triggers the panic mode when pressed. On activation of the panic mode, the camera attached to the watch clicks the pictures of the surroundings and the GPS module collects the location coordinates of the kid and transfer the same to the parent app and to the official numbers that are saved in the child app. Geocoding and reverse geocoding are the technologies that are applied here. Geocoding is the process of converting addresses (like a street address) into geographic coordinates (like latitude and longitude), which you can use to place markers on a map, or position the map. Reverse geocoding is the process of converting geographic coordinates into a human-readable address. The camera module attached to the special watch is used to capture the pictures of the surroundings when the panic mode is on. The camera will turn on only if the SOS button is pressed. The camera consists of a lens which focuses light from the scene and it is this picture that is sent to the parent's app. Here, there is a 2.0 MP camera which helps you to take stunning pictures. The camera is capable of

2592 x 1944 pixel static images, and also supports 1080p30 and 720p60. Here the parent is referred to as the remote user. They will be the one who is receiving the GPS coordinates and the image of the panic situation via notifications to the corresponding application. When the SOS button is pressed the GPS coordinates and the background images of the student are sent to the parent's app. The very important advantage of the system is that, the parent will receive alert message to their preset phone number even if the parent is offline. This ensures the facility that the application will work even without the support of internet. Apart from that, if the parent's mobile phone is in silent mode, then also the parent will receive an emergency alarm with a huge sound so that the parent can know that the child is in a dangerous situation. Also, the application provides the facility to send a pre-alert message to the saved numbers in case, if the child feels any source of insecurity.

## II.RELATED PAPER WORKS

An Android based children tracking system using voice recognition was published as an international journal of computer science and information Technology [1]. The tracking system focuses on the security of every child in the school. It also includes a cry sensing system along the child module. The system mainly constitutes of 2 receiver modules and one child module. GPS, GSM and voice recognition module comprises a child module and the receiver modules are placed at the parent's android phone and one at the school control system. At a panic situation, i.e., when the button pressed or when the child cries then a message containing the latitude and longitude is sent to parent's mobile via text message and the content is also updated onto the school database. The main advantage of the system is that voice recognition helps in the activation of the system even when the panic button is not pressed. Also, the details of the child are also sent to the school database in the form of style sheets. Messages are also sent at the arrival and departure time of the student. On the other hand, the message sent is in the form of latitude and longitude thus it is not in an understandable for parents. Also, for the proper working of the system, an external power supply has to be provided. Size of the system is also a major issue.[1]

A multipurpose child tracking system design and implementation was designed in which the system consists of two modules; parent module and child module[2]. When a violation of child safe is detected, a specific sensor in child module will produce a signal. This signal will be sent from these sensors to controller then through transmitter to

parent module which will take the required decision and start the violation handling procedure. The parent can set the system to work indoor or outdoor and depending on this selection the parent module can calculate the distance at any moment between each child and their parent. Global Positioning System (GPS) is used for outdoor distance calculation while change amplitude of RF Signal is used for indoor distance calculation. Also, the parent can delimit the safety distance for each child and when it is overtaken the system will alarm both of them the parent and child. The system periodically receives messages and in response send messages to the parent module and alert them if the child is in danger. Also it contains sensor driving circuits, GPS, PIC, Transceiver, Buzzer, LCD and Keypad and it works only with internet connectivity. But the system is costly to implement and design very complex.

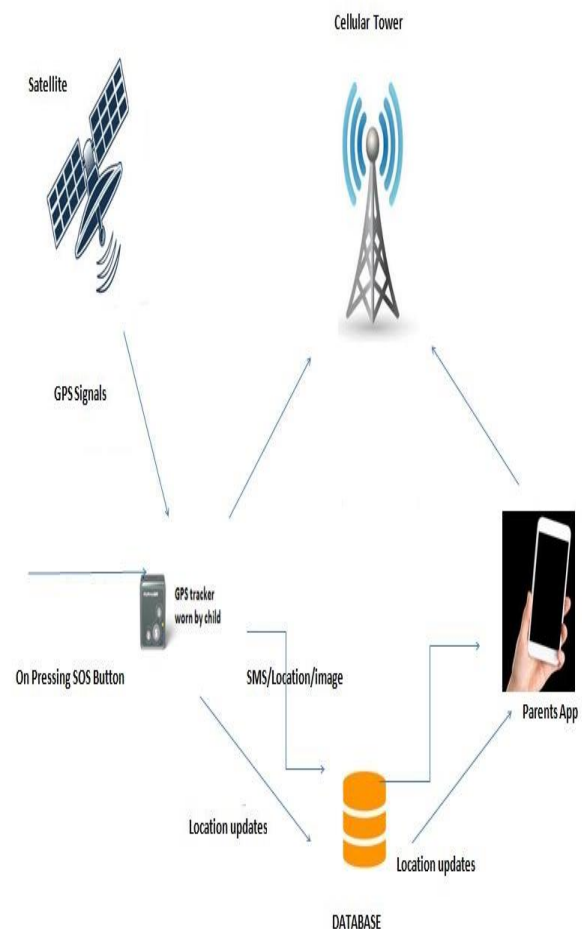
The Implementation of children tracking system on android mobile terminals is discussed on [3]. Recently, all over the world, crime against children is increasing at higher rates and it is high time to offer safety support system for the children going to schools. This paper focuses on implementing children tracking system for every child attending school. However the existing systems are not powerful enough to prevent the crime against children since these systems give information about the children group and not about each child resulting in low assurance about their child safety to parents and also does not concentrate on sensing the cry of the child and intimating the same to its parents. The proposed system includes a child module and two receiver modules for getting the information about the missed child on periodical basis. The child module includes ARM7 microcontroller (Ipc 2378), Global positioning system (GPS), Global system for mobile communication

(GSM), Voice playback circuit and the receiver module includes Android mobile device in parent's hand and the other as monitoring database in control room of the school. Finally, implementation results for the proposed system are provided in this paper. The proposed system includes tracking the child's movement to and from school. The information pertaining to missed child is sent to control room of the school as well as to their respective parents, if they move beyond the coverage area. Not only the information about the child's whereabouts but also whether the child is crying is sent to parents through text message to their Android mobile device. It uses "Autonomous Clustering technique". It uses voice playback circuit. On the other hand, while comparing it with our system, It does not contain the camera module and the alarm specification. RFID –GSM imparted school children security system is another paper that mainly focuses on the child safety and also to keep track the bus at high speed. A wireless sensor network is used here which constitutes accidental detection sensors which are implemented on the front portion of the bus to avoid collision with some other vehicles. Also a wireless technology is adopted to inform the status of school bus to school principal. This is made possible by scanning the RFID (Radio Frequency Identifier) tag which is placed on the school bag. Absentee record is also kept and is send to the parent and to the school principal. The

information regarding the child is send to the parent using GSM technology. The advantage of the system is that it gives the bus status to school principal. Also, if a student entry is not detected at a particular location, then absent message is send to parent. But the working of the system depends on every hardware components.

### III.SYSTEM ARCHITECTURE

The GPS receiver module that is being worn by the child is continuously receiving the signals from the satellites. These satellites are located in the sky and continuously send data down to earth over respective RF frequencies. GPS receivers have tiny processors and antennas that directly receive the data sent by the satellites and compute the position and time. The receiver module contains an SOS button that triggers the panic mode when pressed.

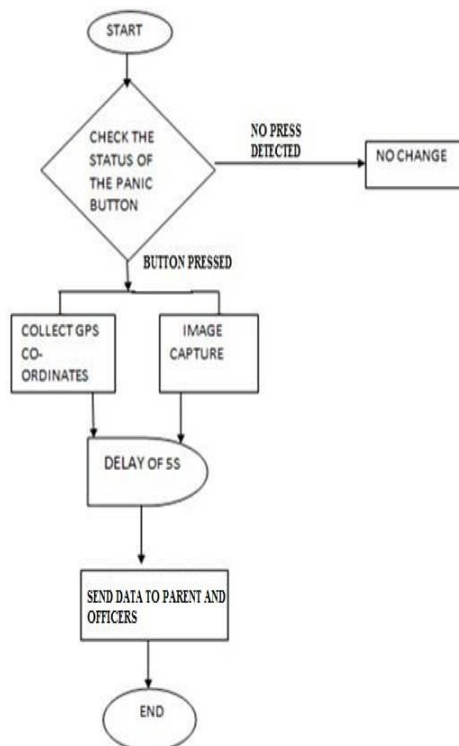


On activation of the panic mode, the camera attached to the watch clicks the pictures of the surroundings and the GPS module collects the location coordinates of the student and transfer the same to the parent app and to the official numbers that are saved in the child app. Before sending these details to the parent app and to the official numbers, these information are saved in the database of the server. Also, there exist a provision for the child to send a pre-alert message to the parent incase if he/she feels any sort of insecurity.

#### IV.SOLUTION METHODOLOGY

This paper proposes an android based solution to aid parents to track their children in real time under anticipation of danger. The speculative model and its congruous functioning is being discussed in this section. On activation of the panic mode, the camera attached to the watch clicks the pictures of the surroundings and the GPS module collects the location coordinates of the student and transfer the same to the parent application and to the official numbers that are saved in the child application.

##### FLOWCHART



- ⊙ Initially, the SOS button is not active.
- ⊙ When the student feels any sort of insecure feelings he/she can press the SOS button.
- ⊙ So, here the status of the button is always checked.
- ⊙ When the button is pressed, the GPS module and the camera module will turn on.
- ⊙ The GPS coordinates and the background image of the student's surroundings are captured within a delay of approximately five seconds.
- ⊙ The data will be sent to the parent via a notification to the parent's app.

#### ALGORITHM

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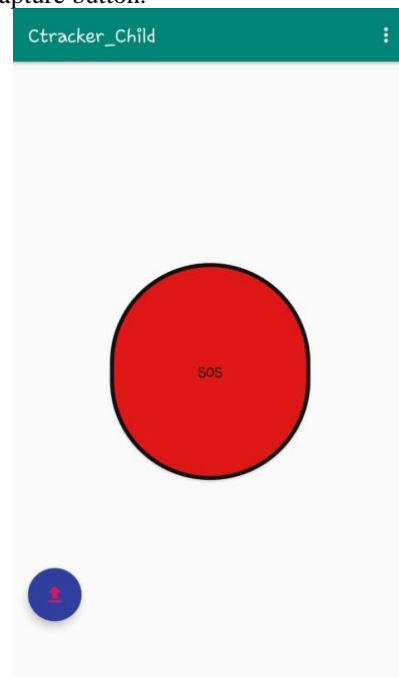
Child tracker ( )
{
// child side ( )
E_no = get the emergency number // initialize emergency number to E_no.
O_n1 = get the number of first official
O_n2 = get the number of second official // initialize official numbers to O_n1, O_n2.

Loc = get the GPS co-ordinates // initialize the GPS co-ordinates to Loc.
Image = capture the image // initialize the captured image to Image.
On click (SOS Button)
{
Display ( Loc, Image) // display location and image on E_no and location on O_n1 and O_n2.
Call ( E_no) // call to the emergency number.
}
On click (prealert)
{
Display (loc) // display location on E_no.
}
//parent side
No = Enter the parent number // initialize the parent number to No.
Display (loc, image) // display location and image on E_no and location on O_n1 and O_n2.
  
```

#### V.RESULTS AND DISCUSSIONS

The user view for the application is being shown in this chapter. The different stages and functioning is portrayed for better understanding.

1. The home screen that appears on the child side which contains a SOS button and an image capture button.



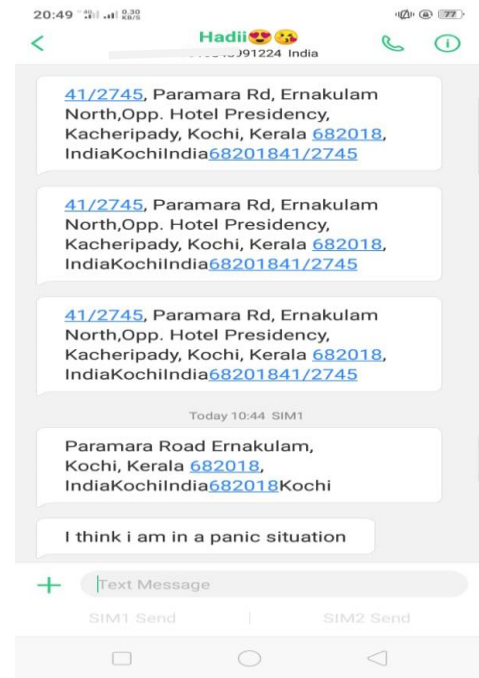
2. The page where the parent's number is saved. A call, message and image of the location is sent to this saved number.

The screenshot shows the 'Ctracker\_Child' app interface. At the top, there is a green header with the text 'Ctracker\_Child'. Below the header, there is a text input field labeled 'Enter Parent Number'. A green 'SAVE' button is positioned below the input field. At the bottom, there is a section labeled 'Saved Number' which displays the number '8606262493'.

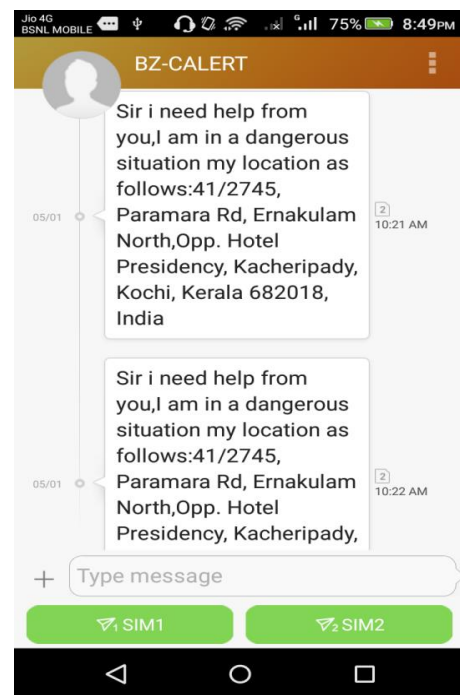
3. A maximum of two official numbers are to be saved so that all the details being send to the parents can be received by the officials also.

The screenshot shows the 'Ctracker\_Child' app interface for saving official numbers. It features two text input fields labeled 'Enter official number-1' and 'Enter official number-2'. Below these fields is a red circular button with a white right-pointing arrow.

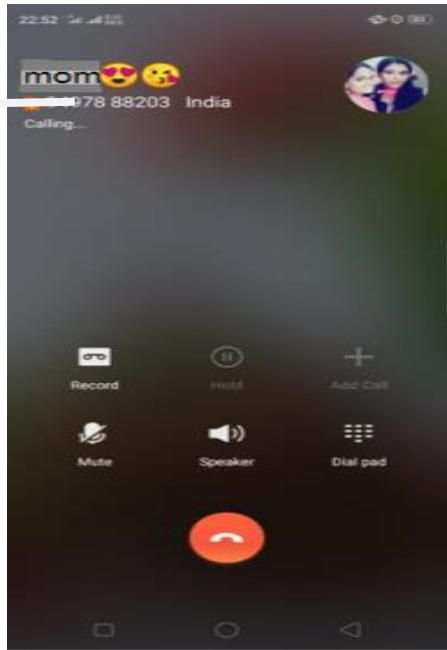
4. The current location is send as a text message from the child's number to the parent and the official authorities. The last message is a pre-alert message send by the child's application when the pre-alert option is pressed by the child.



5. Current location of the child is send to the parent and the official authorities similar to the promotional messages.



6. Mother is called as soon as the SOS button is pressed by the child at any panic situation.



#### VI.CONCLUSION

The developed prototype is attached to a watch. This special watch implements the use of real time system. As soon as the student presses the SOS button, his GPS coordinates and the distress image is sent to the specified app of the parent. The return information message sent to the parent is an added advantage so that even if the parent is offline, they will receive text message. In future this proposed methodology can be enhanced by replacing the watch by a more sophisticated system. The components can be assembled in the school ID or any other portable item. In future the proposed methodology is to be modified by introducing the automatic attendance-uploading feature, immediate result updating, sending assignments and project details to the smart school bag and many others.

#### VII. ACKNOWLEDGEMENT

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#### VIII. REFERENCES

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