



IOT based Child Safety Device Using GSM and GPS

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Abstract: The proposed device is a small handset-sized device with a single panic button on it with no screen. The device has been made with an intention to prevent child kidnapping and abduction cases happening around the globe and to locate the child when lost in crowded places. The device consists of a GPS system that will continuously send the location coordinates over an IOT platform. As soon as the child presses panic button over the device a one-way audio call will be generated over a predefined number, followed by a text-based alert consisting of a login ID of the app and location coordinates that will directly take you to the map. Parents can share these details with the concerned authorities. IOT platform is mostly used for keeping location history and storing call recordings. Parents, after hearing the on-location voices can also trigger the buzzer located on the device, if needed.

Keywords: IOT platform, GPS and GSM system, one-way Audio call, on-location voice, buzzer

I. INTRODUCTION

The child abduction cases have substantially increased in the past few years. Many children even fall prone to child trafficking due to lack of alertness by school authorities. A survey conducted in Mumbai, India by India Today shows that the year 2019 accounted the kidnapping of 3,041 young boys and girls. Of which there were 2,000 young girls whereas the count of boys was at 1,041. Of the above 1,422 girls and 792 boys were found but the rest remained untraceable. A single city in a single country showing these facts is scary and hence this area should become everyone's concern. Hence, we've come up with a solution for the safety of children outside home.

The purpose of our device is to help parents locate their children with ease. The main purpose is to inform the parents about the current location of the child using IOT.

At the moment, there are many wearable and non-wearable devices in the market which use technology like **Bluetooth**. Most mobile devices have SOS facility in case of emergency. Rests are the **application based** so they require a mobile phone with the child always making the child mobile addicted.

The security measures used by school authorities like **RFID tags, indoor navigation** have their parameter up to the school premise.

Secondly, not everyone can afford costly android that provide SOS and apps specific security to kids.

Taking all the above considerations into account, the device we've proposed is a small handset-sized box with a single button on it which is the panic button **with no screen**. This is because we don't want the child to become too engaged in the device. Also as the device is too small, it can be easily carried anywhere.

II. BLOCK DIAGRAM



Fig. 1 Architecture of the proposed device

The **chargeable** device consists of a GPS system for real time tracking, a GSM system for generating SMS and one-way call, a microphone for recording audio, a buzzer that will act as a secondary help for child and a panic button. Pressing the panic button triggers the entire action. The **NODEMCU** here is used



to provide WI-FI to the system because of **inbuilt ESP8266**. It is also used as an Arduino. The IOT platform we've used is THINGSPEAK and its main purpose is to store the real time data such as location and call recordings. The entire circuitry is enclosed in a case that is of the size of Mobile phone so that it can be easily carried anywhere.

III. WORKING

GPS on the device continuously sends the location co-ordinates in the form of longitude and latitude on the IOT platform using ESP8266. In case of emergency, the child has to press the panic button that will trigger GSM to send an alert in the form of message, consisting of location details on the registered mobile number.

It will also trigger a one-way Audio all facility so that the parents can hear the on-location voices using microphone located over the device and can take actions accordingly. The call is one way that means the child can only speak and will not be able to listen anything so that it doesn't make it a mobile device. In case the child is stuck anywhere or is in any crowded place but is panic the parent can start the buzzer over the device so that the kid can get immediate help. Parents can also share the details with authorities nearby for help. In addition to store location details the IOT platform will also store the audio for help.

The solution provides only registered customers to use the application and hence is secured.

The figures beside show the intermediate results of the device.

Fig. 2) One-way call via GSM over authorized mobile number.

Fig. 3) Output of GPS

Fig. 4) Location of the device over BLYNK app.

Fig. 5) Emergency message to the authorized mobile number.

Fig. 6) shows the recorded or stored values of longitude and latitude over Thing Speak (IOT platform).

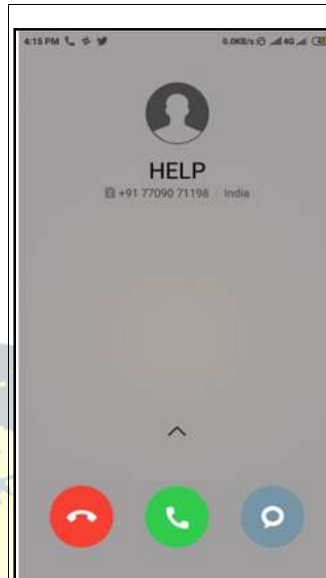


Fig. 2



Fig. 3

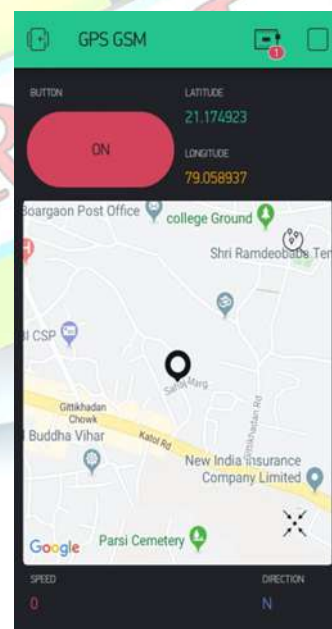


Fig. 4

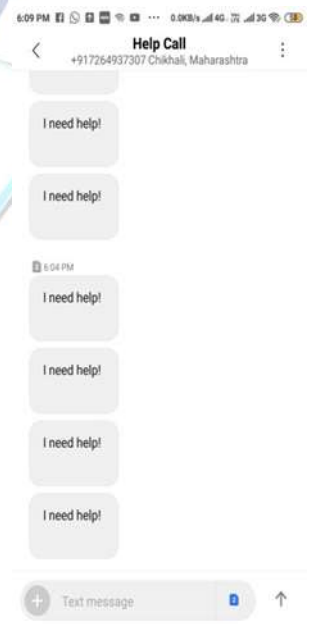


Fig. 5

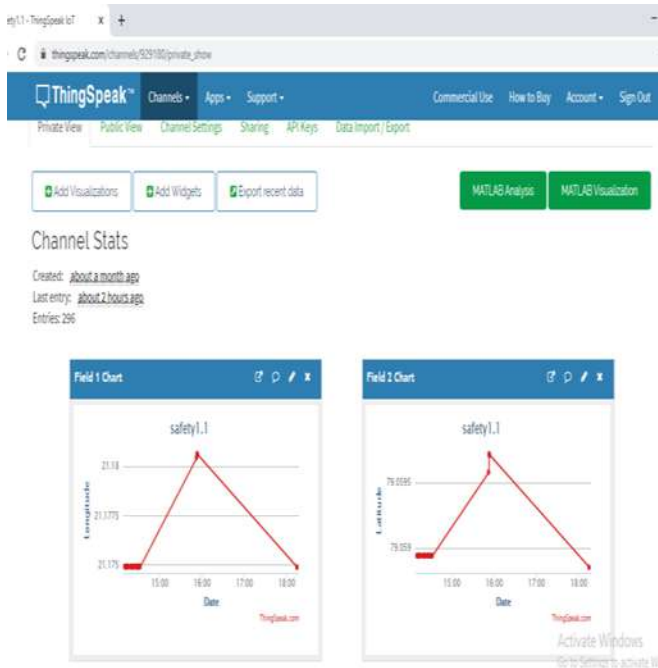


Fig. 6

IV. CONCLUSION

The device doesn't have any screen. Nor it has two-way call facility like a normal mobile device. Thus, this device becomes ideal to give to your child.

The parents have no need to monitor their child continuously. When the child presses the panic button, message regarding the details of the location is delivered and a one-way audio call is connected. So, the proposed system can prevent kidnapping and abduction of your child and also help find them if they're lost in a crowded place. And because, the device is built like this, we believe it will comply with the school norms.

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