DEVELOPING INTELLIGENT SYSTEM FOR CHILD SAFETY USING RASPBERRY PI

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ABSTRACT

The safety and security of school-aged children is a major worry and priority in today's world. Many children in India are missing and die as a result of traffic accidents owing to a lack of preventive safety measures. Parents are still concerned about their children during commutes. This project provides an intelligent solution based on the Raspberry Pi to assist parents in tracking the whereabouts of their children in real time. The suggested application use an AI thinker and camera to map the location and determine the child's condition outside the house. The Raspberry Pi serves as the device's main microcontroller. The plan also suggests security measures such as person identification, geo-fencing, and turning on and off the device automatically using a thumb imprint. The functioning test model of the developed system has high precision while taking less time to compute. We can assure the safety and security of every school child by combining all of the characteristics listed above.

Keywords: Raspberry pi, Child Safety, Security, Safety, Face Detection.

I. INTRODUCTION

Children are designated as "Supreme National Property" under the National Children's Policy of 1974. We are the bedrock upon which a strong and stable India will build its future. Child crime rates have risen in India in particular over the years. Nowadays, both parents work and are unable to supervise and keep track of their children's numerous activities. As a result, when children return from school, they may be kidnapped and subjected to crimes such as kidnapping, enslavement, child labour, sexual assaults, and so on. Over the previous nine years, 300,000 Indian women and 64,000 girls have been abducted, according to documented incidents. Every year, the number of incidents of women kidnapping rises by about 11.73 percent. According to the National Crime Statistics Bureau, kidnappings of females have increased by 23.2 percent per year. According to the crime bureau, young children account for about 85 percent of all kidnappings worldwide.

Smartphones are become a consumer's vital necessity, with applications giving a plethora of services that make our lives easier and more comfortable. The periodical is concerned on children's safety. Today, child safety is a major problem worldwide, since child abuse is on the rise. In this article, we explored how a smart gadget provides monitoring and tracking to parents, allowing them to effortlessly monitor their children based on their needs. This suggested framework supports the following fundamental strategies for this application on the Android platform:

(A) Geo-fencing

(B) position tracking using AI Thinker

(C) AI Thinker Messaging Service

(D) Recognizing a person's face

GPS is useful for kid tracking since it offers information about where the baby's parents are now located. In this situation, the youngster can utilise SMS systems to send a text message or specific position to the parent when cellphones do not have Internet connectivity. When children are in danger, we employ the process of speech-to-text translation to communicate with their parents. Because their mobility is mirrored on the mobile parent via Google maps, this technology will assist parents in monitoring the whereabouts of their children without telling them. This approach is also beneficial for females who do their study or work from a distance. In the event of an emergency, they will notify their current position to their parents through SMS or miscall in a dangerous circumstance.

A. Platform

The Android app runs on the IoT platform and is used for GPS tracking by a variety of mobile devices. It is the GPS's job to maintain track of the device's location and to respond to device alerts. GPS, on the other hand, is utilised to locate the system with the help of a cellular network. The device's mobile app employs GPS and GSM technologies to track the child's location in the online app. The parent can adjust the level of position alerts to meet their needs.

B. Problem Definition

Abduction and murder of Nurlin Jazlin in 2007, the issue of missing children sparked a slew of issues around the world. However, the missing case is still prevalent, particularly in India, which has the highest number of missing children. There were a total of 14 registered missing children in 2014, 1782 cases documented in 2015, and 140 cases reported in January of this year alone. These figures demonstrated the gravity of missing persons cases in India, necessitating questions from parents about the cases. It is difficult for a parent to keep an eye on their child without the use of technology, particularly when the child is outside. The parent can't even stop us from making the same mistake again. The assessment may indicate that the parent is now distracted by their smartphones, which can cause them to forget about their child for a few seconds or even minutes, putting their child at risk of going missing in just a few seconds. The parent wishes to keep track of their child's whereabouts while the child is not present, as well as to be notified when their child enters or exits a specific location. We could also continue to track our child using sound recording or even CCTV thanks to emerging technologies. However, each has its own set of disadvantages and drawbacks. For example, CCTV can only be used to supervise the infant and can only be used indoors, not outdoors. We couldn't monitor the child when they were outside of CCTV's view; the sound recorder could only capture sound, so we couldn't know their position in real time or the direction they were going, which was inconvenient. A new approach is required to overcome the current constraint of using that technology to track the infant. Furthermore, despite the fact that an existing child tracking device was commercially sold, most parents did not receive a greeting address from the child tracking system, according to findings about parents' use of electronic apps. Even before the advertisement, information about the child tracking system was made public. That is the only explanation the system's existence is known to a small number of parents. The official and unofficial distribution websites only offer a small selection of the one based on my review. Many of the devices are limited to a single area and do not adhere to the parent's technical standards. And if it's affordable, most smartphones must be imported, and the prices are in US dollars or Euros, which are very expensive when converted into INR, but the mobile option can be a safer alternative for parents to track their infant. Smartphones have recently become a device for everyone. Smartphones can do everything from calling to monitoring, and most kids get their first smartphone because they're small and parents don't have to buy an extra tracking device just to keep an eye on their children. According to the study, 58% of children between the ages of 1 and 12 own a mobile phone.

II.   METHODOLOGY

We are developing a system to keep children safe. The system is made up of an AI thinker that combines GSM and GPS. The Raspberry Pi is used as a key controller. In the current system, we improve geo-fencing by using this device to set boundaries. When the child crosses the boundary, parents receive a warning via miscall or SMS, and the buzzer activates, allowing us to measure the child's distance from home. We also use speech-to-text conversion for child safety. The thumb impression is automatically turned off and on whenever the child is in the home system. Our programme is extremely beneficial to both children and parents. Figure 2 depicts a diagram of the child protection structure.
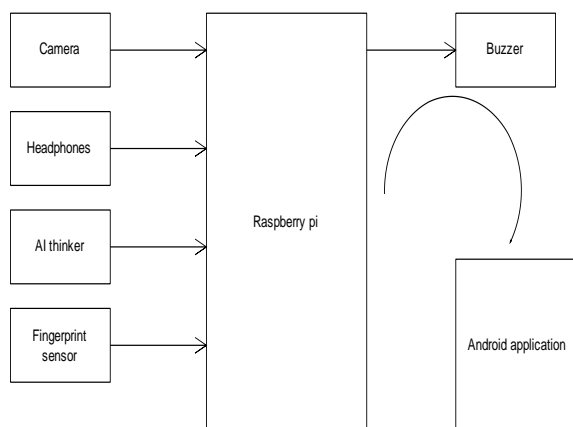
Figure 1: Block diagram of child safety system

We needed GPS to enable smart phones to track the child's location while developing this application for parents, and we needed Android SDK tools to support the development of Android applications. The reason for selecting the Android operating system is that millions of people are now using smartphones on a daily basis. GPS and GSM technology are used to identify and respond to lost children. This GPS and SMS use is supported by two primary services. GPS is used for location services, whereas SMS is used for telephony.
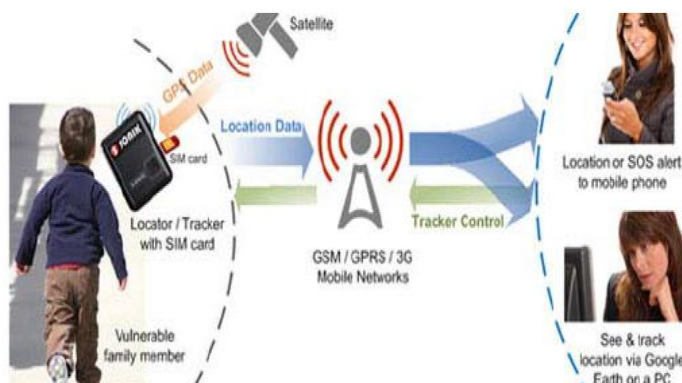
Figure 2: Architecture of system

III.   FUTURE SCOPE

1. Enhances the geofening experience by developing your own geofening API with appropriate algorithms that allow the parent to construct various types of geofening rather than simply drawing a geofening circle.

2. Enhances knowledge of the route's history by developing its own algorithm to estimate and maximise location estimates in order to solve the problem of fluttering motion while the child is in the same location.

3. Among those who contribute to the service, network monitoring functionality will be added, allowing parents to share the tracker with a predefined trusted group in order to help monitor their child in the future.

IV.   RESULTS AND DISCUSSION

We receive the same results as we create systems. First, we develop systems on software to test their operating parameters. Figure 3 depicts the built system on software, and Figure 4 depicts the result of face recognition.
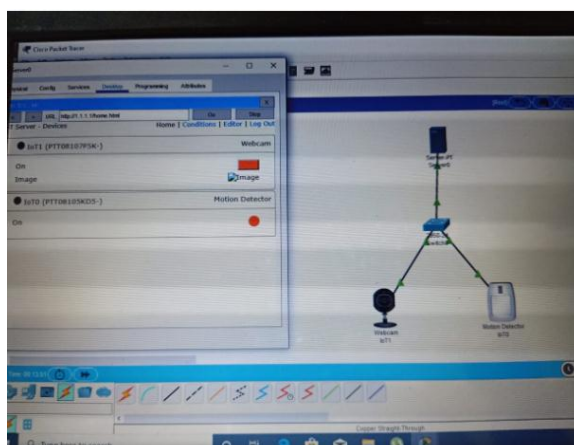
Figure 3: System Design on Software
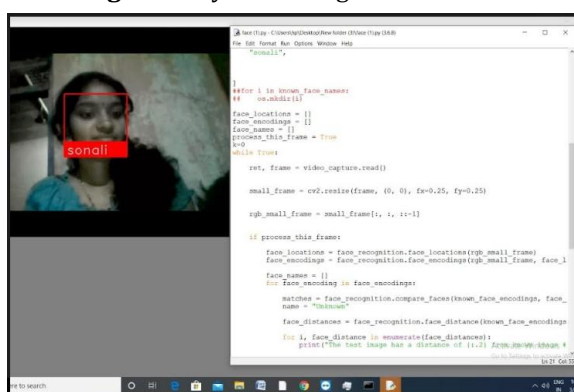

Figure 3: Face recognition

V.   CONCLUSION

Finally, the goal of this initiative is to find missing children and ensure children's health. The solution provided in this paper makes use of the smart framework, which includes several capabilities like as Google Maps, GPS, SMS, and so on. Many of the better works that have been executed in the past rely on SMS-based monitoring, which does not help to supply a specific function in our suggested system. Geo-fencing and Emergency Messaging systems have been incorporated to further enhance the architecture.

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VI.   REFERENCES

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