IoT Based Safety Gadget For Child Safety Monitoring & Notification

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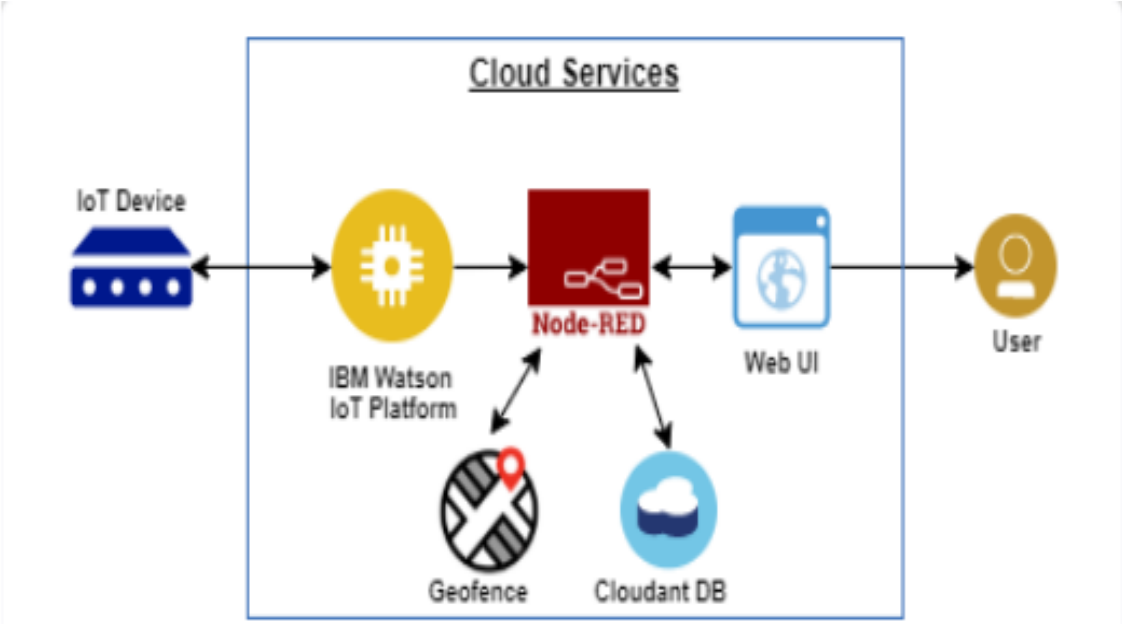
PROBLEM DEFINITION:

Now a days, crimes on children keep increasing despite actions have been taken by the government. For every 40 seconds, a child is gone missing in the world. The overall percentage of child abusements filed nowadays in the world is about 80%, out of which 74% are girl children and the rest are boys. Childrens are the backbone of one's nation, if the future of children was affected, it would impact the entire growth of that nation. Due to the abusements, the emotional and mental stability of the children gets affected which in turn ruins their career and future. These innocent children are not responsible for what happens to them. So, parents are responsible for taking care of their own children. But, due to economic condition and aims to focus on their child's future and career, parents are forced to crave for money. Hence, it becomes difficult to cling on to their children all the time. In our system, we provide an environment where this problem can be resolved in an efficient manner. It makes parents to easily monitor their children in real time just like staying beside them as well as focusing on their own career without any manual intervention. In this system, the collected values from every sensor like temperature sensor, pulse rare detection sensor, metal detection sensor and location value from GPS are used to detect the status of the child and alerts the respective guardians using GSM module.

TECHNICAL ARCHITECTURE:



PAPER 1

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Proposed Model: 1) Safety Gadget,

2) BLE Listener Device.

Proposed By: **N.** Manjunatha, H.M. Jayashree, N. Komal, K. Nayana

IEEE Accessing Year: 2019

Conference Location: Bengaluru, India

IoT Based Small Gadget for Child Safety and Tracking

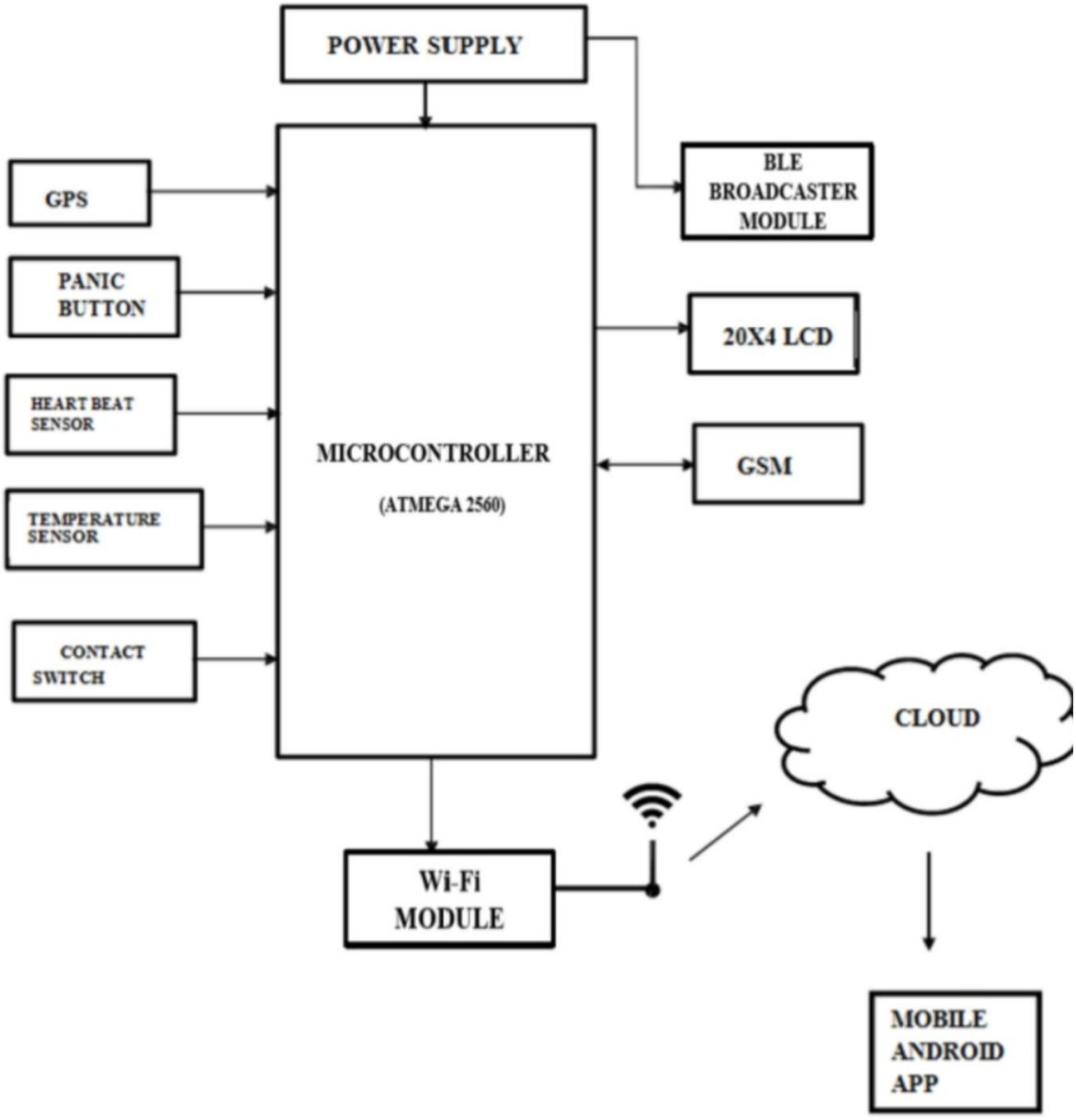
Internet of Things:

It refers to the set of devices and system that stay interconnected with real-world sensor and to the internet. During years' Child safety is under threat and it is very important to provide a technology-based solution which will help them under panic situations and monitor them using a smart gadget. The proposed system is equipped with GSM and GPS modules for sending and receiving call and SMS between safety gadget and parental phone, the proposed system also consists of Wi-Fi module used to implement IoT and send all the monitoring parameters to the cloud for android app monitoring on parental phone. Android application can be used to track the current location of safety gadget using its location coordinates on parental phone android app and also via SMS request from parent phone to safety gadget. Panic alert system is used during panic situations and automatic SMS alert and phone call is triggered from safety gadget to the parental phone seeking for help and also monitored for plug and unplug from hand, as soon the gadget is unplugged from hand a SMS is triggered to parental phone and the alert parameter is also updated to the cloud. Heart-beats, temperature is monitored and the values are updated to cloud continuously for parent app monitoring. Boundary monitoring system is implemented on safety gadget with the help of BEACON technology, as soon as the safety gadget moves far away from the binding gadget an alert is provided to parent on binding gadget. the system is used to monitor the health parameters and also used for location tracking during necessary situations in safety concern.

Safety Gadget:

It consists of inbuilt Wi-Fi, GSM, GPS and Bluetooth modules. The link it one board is similar to the Arduino board and it is termed as all-in-one prototyping board for safety and IoT devices. The link it one is a robust development board for the hardware and also used for industrial applications. Different components such as temperature sensor, heartbeat sensor, panic button, contact switch are connected to the link it ONE board along with built in GSM, GPS module. Safety gadget consists of BEACON and BLE packet is transmitted through it, this packet is

received by binding gadget which has BLE receiver module, the packet usually contains information such as identification number, signal strength etc. Temperature is one of the most commonly measured variables. For measuring body temperature of the child DS18B20 temperature sensor is used. The heartbeat sensor is used in the proposed system for measuring the pulse rate.



Software Specification:

The Arduino Software (IDE) which is an open-source and makes it easy to write the code as well as to upload in to the board. It runs on the Linux, Mac, IOS and Windows. The programs are written in Java, based on the Processing and other open-source software. This software makes the interfacing with Arduino-Uno much more reliable. The primary reason for using the GS shield as the mode of communication over Wi-Fi and Bluetooth was that this gadget was aimed at being accessible to any smartphone user. Also, to make the user-friendly as possible.

Output of live location tracking

Output of health monitoring system

Hardware Specification:

The heart of the gadget is the *Arduino uno*, its connecting the functional components like various types of sensors, GPS, GSM, buzzer, button.

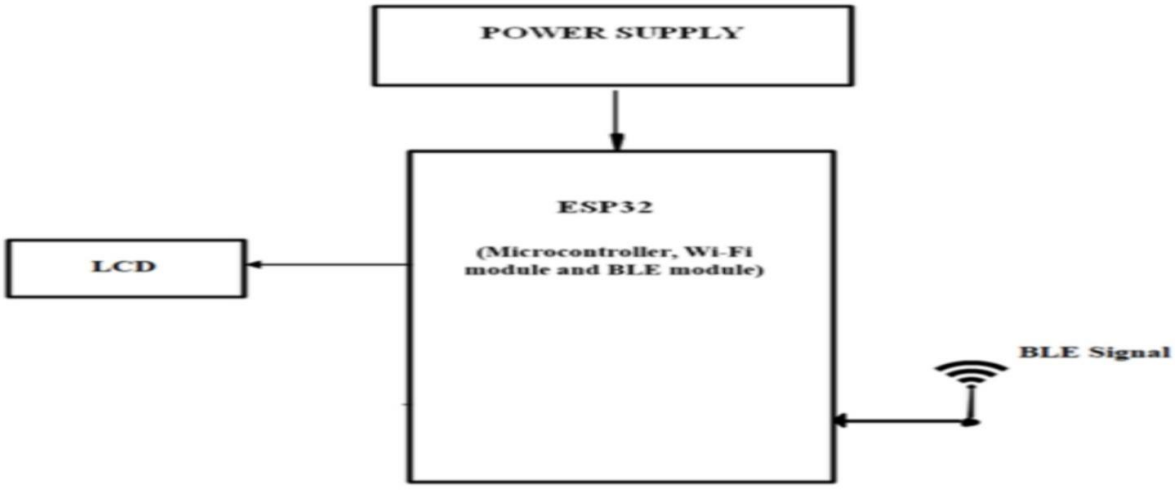
Live Location Tracking: GPS is installed on gadget to track its current location can be tracked on android app and via SMS request sent from parent phone to safety gadget.

Panic Alert Systems: Panic alert system on gadget is triggered during panic situation, automatic call and SMS are triggered to parental phone. The alert is also updated to the cloud for purpose of app monitoring.

Health Monitoring System: Health monitoring system is implemented using heartbeat sensor, temperature sensor which is updated to the cloud and also can be monitored via app. The current value of sensors can be obtained using SMS request sent to gadget from parent phone, the circuit connection with sensors. The temperature sensor, pulse sensor, BLE module, GSM module and GPS module.

BLE Listener:

The BLE Listener device is the device which is used to satisfy this feature along with safety gadget and parental phone. This gadget is also used to monitor safety gadget within a bounded area using wireless technology as follows, this feature of binding gadget is designed to work independently without phone network signal/internet so that safety gadget can even be under monitoring when it reaches remote areas where communication signals is not reachable like forest. Safety gadget consists of BEACON and BLE packet is transmitted through it, this packet is received by binding gadget which has BLE (Bluetooth Low Energy) receiver module, the packet usually contains information such as identification number, signal strength etc. Whenever the packet is received it checks for all the above information in the receiver device. As the distance between safety gadget and binding gadget increases, the signal strength decreases. Once the safety gadget is moving out of threshold distance from the binding gadget then an alert is provided on binding gadget which will be used by parent/guardian.



Final outcome:

PAPER 2

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Proposed Model: Automatically Safety Monitoring System for Child Based on IoT

Proposed By: N. Senthamilarasi, N. Divya Bharathi, D. Ezhilarasi, R.B. Sangavi.

IEEE Accessing Year: 2019

Conference Location: Chennai, India.

Child Safety Monitoring System Based on IoT

Basically, children cannot complain about abusements, which they face in their daily life to their parents. They can't even realize what actually happens to them at their age. It is also difficult for parents to identify their children are being abused. Since to prevent children before being attacked, an autonomous real-time monitoring system is necessary for every child out there. In this system, the collected values from every sensor like temperature sensor, pulse rate detection sensor, metal detection sensor, and the location value from GPS are used to detect the status of the child and alerts the respective guardians using GSM accordingly.

EXISTING SYSTEM:

We use a voice recognition module in which the alert commands from the child are stored and kept for further reference. If the same child delivers the same command, it will compare with the alert command which was previously stored and sets an emergency level according to the alert command. The GSM has a SIM which is used to send an alert message or an alert call to the trusted peoples. GPS is used to track the live location and it is used when needed. The server will search the respective device ID from the database and search for respective contacts according to that device ID and helps in alerting the registered guardians.

PROPOSED SYSTEM:

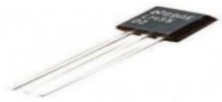
Our proposed system consists of Raspberry Pi microprocessor in which all other sensors, GPS and GSM are integrated. The users are required to register using their credentials to use the application. The device will be given to the children for monitoring them regularly. We will feed the boundary value while writing code for the system and we control it using GPS for that device which is also known as Geo Fencing. These data are stored in the server. If the device moves, out of

that boundary the server transfers an alert call by activating the GSM, to the user. The live location of the device will be updated in the server and pinged in the website for every few seconds. The server side, coding was written in PHP and the controller side coding was written in Python. The user will receive an alert call and after entering the login ID and password, they can check the live location through GPS, which was updated in the application. When giving boundary for the school unit, we can also maintain attendance by updating the entry and exit of the child, in and out, of school in the application.

We feed specific threshold values for sensors like temperature and pulse in which, if the device exceeds those threshold values or if the device gets exposed to abnormal condition, then those values tend to be updated in the server. The server compares the currently obtained values with the coded threshold values, if they are beyond the threshold value, it generates an alert message through GSM. The alert messages are delivered to specified users in the form of SMS and the user can be able to login to the application to check the status and updated information. After receiving the alert messages, if the user wants to visually check the status of the child, they are required to enter specific IP address of that camera for the first time before syncing and can be able to watch the live streaming videos which are updated to the server, for further uses they can directly view.

The microprocessor is used to control all these actions and the alert was done by checking for specific user of that device in the database. further uses they can directly view. The microprocessor is used to control all these actions and the alert was done by checking for specific user of that device in the database.

GPS

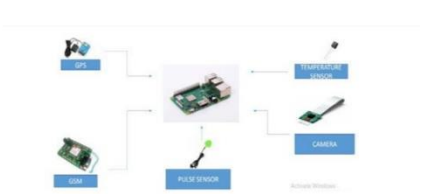


Temperature sensor

Pulse sensor

Web camera

GSM



Final set up

PAPER 3

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Proposed model: GPRS module is used to access the internet so that if can connect with device both parent and the child

Proposed by: G.J. Nandhini, P.S. Greeshma, S. Yashas, Shivankonda R Patil.

IEEE Accession Year: 2020

Conference location: India

Low Cost Intelligent Child Safety Wearable IOT Device

Nowadays the synopsis of the child getting lost in the major crowded areas are increasing, which was the main motivation that comes for safety of little children. This project focuses on the aspect of the lost children who can play a remarkable role in the child's safety until reconvene with the parents. Most of the wearable devices today are focused on the location, activity, temperature, pressure etc, of the child and informs to the parents via GPS. Therefore, it is intended to use voice call as the way of communication between the parent mobile and child's wearable device. The manifesto on which this project will be running on the microcontroller board and the functions of sending and receiving notification, calls, voice messages.

Therefore, the wearable device proposed will communicate with the parent via voice call which ensures the security. Also, customization of the wearable device is possible by reprogramming the system as per our requirements. GPS module determines the location by analyzing the signals that are received from GPS satellites which are orbiting around Earth These satellites send signals that takes long time to reach the GPS module. Calculation of the distance from several satellites can be done based on the amount of time taken by the signals to reach the receiver. After determining the distance from some satellites, using triangulation the GPS module calculates its own position. One of the most amazing found in technology is Geo Fencing technique that nowadays mostly used in security national defense.

This is a feature in software developing program that uses the global positioning system (GPS) module to trace the location of the child.

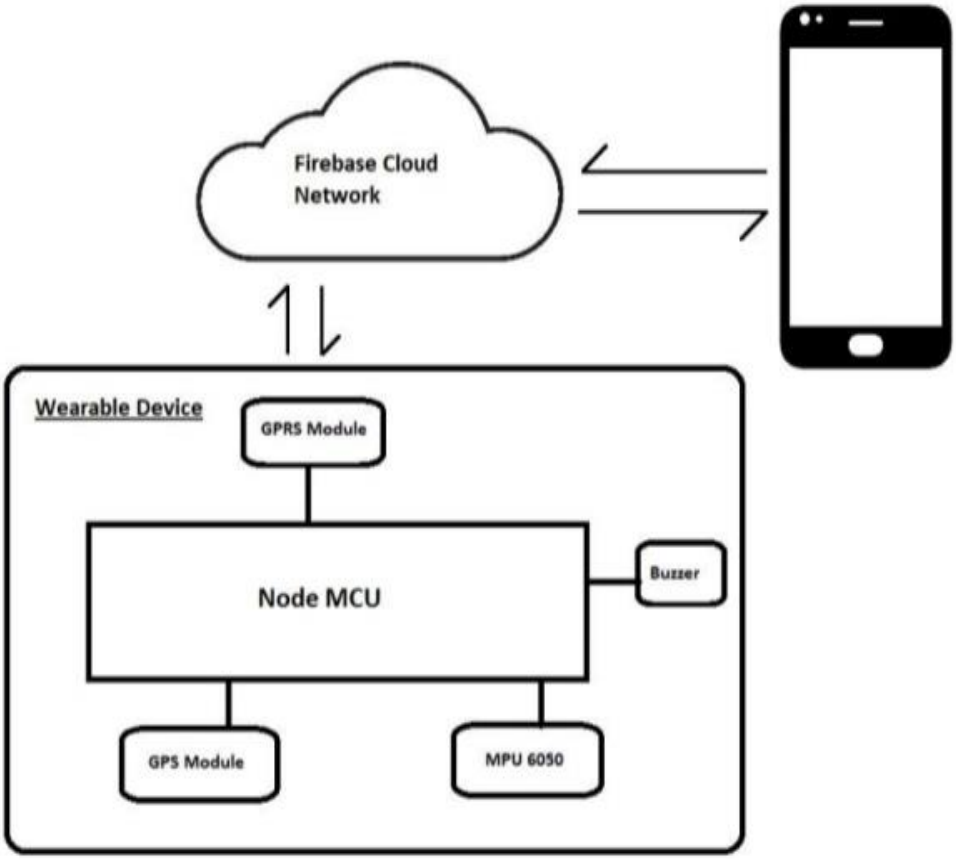
While the technology is growing rapidly, the technique also now used to locate a location of someone or vehicle that can be used for the public or for the private security. Smart security solution for the safety of the child is based on GPS using IOT, the threats against children using smart device based on IOT. The system intends to a wireless technique in the form of embedded devices. This issue of child safety, they developed a prototype which is easy to use and well organized to provide help to that fatality. So, when the victim press the button, collect user information to send notification to registered phone number with link of capture image. The system proposes a location tracking facilities and speed monitoring using GPS, GPRS, and GSM for child safety for low cost which can be affordable by the people. Design, development and implementation of child security monitoring system approach of security application of child. There is a severe rise in number of kidnapping and road accident circumstances. In existing system, there will be message based solution using GPS to aid parent to track their children's location in real time. The system acquires GPS and GSM based system are used to track the location of children health monitoring heartbeat, pressure etc.

Hardware components:

- GPRS
- GPS
- GSM
- ALARM BUZZER
- NODE MCU
- MPU 6050-GYROSCOPE

Technical architecture:

This device is helps for the school student or child. Sensors are useful for tracing the actual location of the child and also dispense the details where the child is currently located away from their parents and also informs the parents the condition and situation of their child. SMS or voice notification services are used to receive the information. When smart mobiles not hold up internet connectivity, in that case child can send a message or can share the correct location to the parents. This system also helps the parent to track the location of their children without knowing by them because their movements are displayed on the parent or guardian mobile.



Graphical Notation:

In this world, there are many trending industries which produce these wearable devices that work using Wi-Fi and Bluetooth. On some census basis, the below graph is represented where day by day the production of these wearable devices are increasing along with some new trending options.

FUTURE SCOPE:

In future, it can be developed the security devices using GPRS module. GPS checks the location on each and every movement. It focuses on children's safety, tracking the real-time location with the help of longitude and altitude, positioning of GPS and sending information through SMS and Voice messages.