

# Literature Survey on smart Child Safety Wearable Device Using IOT

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**Abstract-** In Today's world, the wearable gadgets comprise an increase in market provisioning, wider openings for extemporized authority over security issues for kids in day care and schools. Likewise, women security keeps on being one of the most vital issues that can be addressed today, consequently security of women at working environments, public places is progressively noteworthy issue. This undertaking means to give a total start for secure and wellbeing framework. The thought fills in as confirmation for a wearable gadget with coordinated plan to shorten the need of security issues to women and children. The proposed device is equipped with two modes, adult mode and the child mode that operates accordingly. The sensor empowered gadget gives the real time location and well-being of women and children after accepting signals from sensors. The idea behind this proposed system empowers guardian to locate women and children effortlessly. Pi-camera is used to capture the image in case of emergency. Procurement of raw information from the sensors, trailed by action acknowledgment. Realtime checking of information is accomplished by wireless sensors data to an open-source cloud platform [1].

**Keywords-** cloud,IoT, Pi-Camera, sensors.

## I. INTRODUCTION

Internet of factors (IOT) is the generation which makes tool to sense and manipulate the physical global by way of making items smarter and connecting them thru and sensible network. net of factors makes use of various concepts, protocols, and technologies in IoT platform that can detect four specific physical parameters: temperatures, pH, turbidity and conductivity in water, and analyse the extracted value of Women and child safety is an extremely huge worry in a nation like INDIA where women and child are assuming a remarkable job in every single field. India is a peace adoring nation and one of the safe stations for the visitors over the world. Many ladies or children even now feel unsafe to move around outside in our nation due numerous cases of violence against women and child. To make women and child feel safe and secure we have proposed this project. The object and machine can be sensed and controlled remotely though

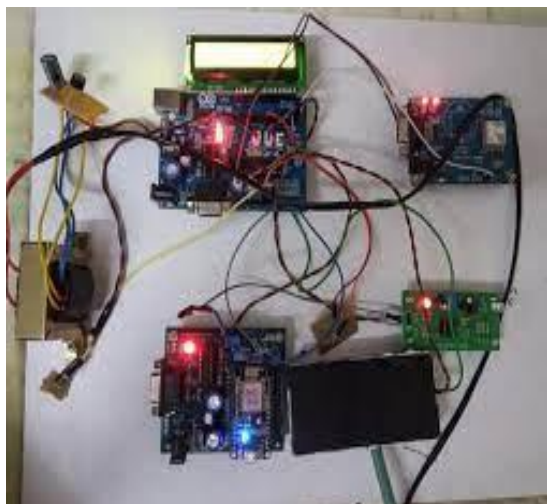
networks. Using IOT we can make things smarter and sensible without using any wires or cables. IOT helps us to use and connect the things wirelessly.

The IOT is applicable in many areas some of them are listed below, [2]

- Smart creatures
- Smart connected buildings
- Connected factory
- Connected roadways
- Smart phones

## II. METHODOLOGY

The methodology used in [1] is demonstrated in the following speaks to a square graph of the youngster wellbeing gadget proposed in the paper. The LinkIt ONE board is an open-source stage. It comprises of inbuilt Wi-Fi, GSM, GPS and Bluetooth modules. Different components such as Temperature sensor, Touch sensor, heartbeat sensor, GSM, GPS modules and serial camera are connected to the LinkIt ONE Board along with built-in GSM, GPS modules. The LinkIt ONE board is an open-source stage. It comprises of inbuilt Wi-Fi, GSM, GPS and Bluetooth modules. Different components such as Temperature sensor, Touch sensor, heartbeat sensor, GSM, GPS modules and serial camera are connected to the LinkIt ONE Board along with built-in GSM, GPS modules. For every 30 minutes except serial camera, the data from GPS, temperature, touch, and pulse rate data is pushed into the cloud. If the values read by the sensor pass a threshold value, then an SMS alert is sent to the mobile. The child's parameters of touch, temperature & heartbeat can be plotted on a graph and used for parametric analysis. This is shown in the circuit diagram below:



**Figure 2.1:** Experimental setup

A fall detection database is presented in [2] to understand how detection algorithms perform. Here, the database initially collects sample data from 24 females and 26 males while they're performing 15 sorts of day-by-day exercises, for example, strolling, running, etc. A total examination of the databases that right now exist and of the proposed database is made. Four algorithms (k nearest neighbor, the artificial neural network, support vector machine, and kernel Fisher discriminant) are used to evaluate the databases' abilities and how we could rely on them. Assessment is made utilizing the conventions dependent on the fall discovery database, and the exhibition of the four calculations is given for the accompanying goals: essential evaluation of the database utilizing the fall recognition calculations; → distinguishing the qualities and shortcomings of the normal calculations; and → get the result of assessment for two and different classes dependent on the database.

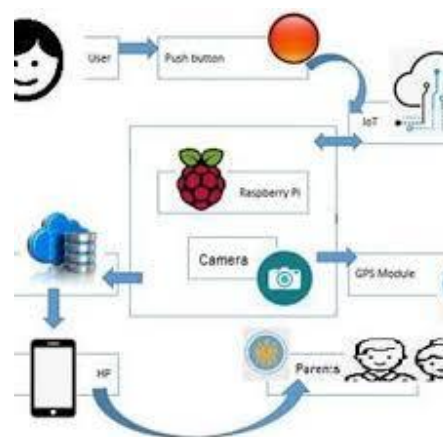
THIS [3] project focuses communication mode to be in SMS text form using GSM. The parent will send a keyword in form of SMS "SOS", "BUZZ", "LOCATION", "TEMPERATURE" etc., to the devices. The device will reply back the real time accurate location of the child and will also provide the surrounding temperature, or any of the data asked by the parents. It helps parents to keep track if the temperature around their kid is not proper for their kid. The secondary idea implemented was distress alarm buzzer and a bright SOS Light on the device that can be activated by the guardians via sending the keywords in the SMS.



**Figure 2.2:** GSM Module

Parents can text the keywords to ON the SOS signal brightly and can also send the keyword to sound an alarm which a people near child or bystander can instantly help the children till the parents arrive. People around could also contact the parents and help them to reunite child with his or her parents. Hence this project provides parents a sense of protection for their kid in today's unsafe environment. The drawback of this system is that parent have to remember the keywords.

Here IN [4] we mainly concentrate on temperature, heartbeat, crying, alerting guardians through smart phone using IoT with the help of raspberry Pi.



**Figure 2.3:** Camera Module

All IoT sensors have analogue ports and they give output as Analog. In order to interface analog values to raspberry Pi Analog to Digital conversion is used. Analog to Digital is a modulation and demodulation process. The different sensors used are Temperature sensor, Heartbeat sensor, Accelerometer and sound sensor. Temperature sensor give values in terms of voltage to IC as 0.35 etc. Heartbeat sensor gives values in terms of pulse PIC microcontroller act as a counter to count Heartbeat rate. Sound sensor gives

analog values. Some threshold is set whenever the external value crosses the threshold. It will detect as child/ women is crying. Accelerometer detects position depending on the coordinates. It gives result in form of X, Y and Z values. All these values from various sensors are analog values, they cannot be interfaced directly with Raspberry pi. So, Analog to Digital microcontroller is used i.e. PIC 16F877A that converts analogue values to digital form. All these values from various sensors are sent to PIC microcontroller that does all AD conversions. Finally, the converted values/information are sent by serial communication by single wire to Raspberry pi3. Raspberry pi3 collects all data from PIC controller and upload it to server. Server used is thing speak cloud. That could be used to monitor health and safety of child/women. The device has two modes. Child mode and women mode. One can easily set the mode to 0 or 1. 0 is child mode and 1 is women mode. The system has lithium-ion battery which is used for power supply with minimum discharge rate. It also has pi camera that is used to capture image of the people in front of the situation. There is an emergency switch which can be pressed manually either by child or women. When an emergency switch is pressed buzzer is activated which is used to alert nearby people so that they can come to the child/women rescue. Depending on the conditions set parents/guardian are notified via SMS and e-mail. SMS through Twilio could be sent along with details of temperature. Heartbeat rate and position of the ward. Email is also sent simultaneously along with the images and other data. Location is also sent in both SMS and e-mail with longitude and latitude values to parent/guardian.

IN system [5] intends to a device wireless technique in the form of embedded device namely Arduino for women that will serve the purpose of alerts and way of communicating with secure channels and it captures the image using electronic camera. There are many android applications for women safety but they as not as much as efficient. So, to solve this issue of women safety they develop a wireless sensor kit which is easy to use and which is efficient to provide help to that victim. so, when the victim presses kits button, our application will capture the photo, collect user's information to send notification to registered phone numbers with link of captured image. This saves the time and that victim get help without loss of time. Also, in the case of Children security the system proposes a speed monitoring and location tracking facilities using GPS, GPRS, GSM. The system consists of bus unit. The bus unit which is used to detect the path of Bus by using GPS.

Weather the bus is travelling on its day-to-day route and also it monitors the over speeding of bus. For the mechanism of vehicle tracking Haversine and Trilateration algorithm are used. According to that by using GSM, alert

messages will be sent to their parents and vehicle owner. The system has been developed on web-based data driven application that provides the useful information.

Raj and Anuradha (2014) [7] surveyed that, 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 (lpc 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.

In paper [8], 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.

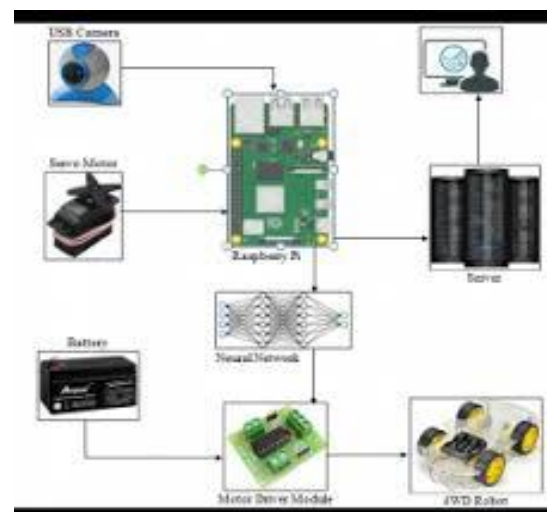


Figure 2.4: Experimental setup

### III. CONCLUSION

This paper surveys various papers related to an IOIOT based safety wearable device that helps the parents or guardians to monitor the safety of their ward or children. The main aim is to provide an effective and convenient solution to the parents or guardians to keep track of their child's safety and in turn to reduce the increased occurrence of crime against missing children. The paper compares the methodologies and the results gained from all of these papers. The Safety wearable device consists of various IOT sensors that provide information about parameters like temperature, UV, location etc. and the values recorded by these sensors are stored on the cloud. In summary, the parents or guardians will be alerted if abnormal values are read by the sensor or if values on these sensors cross a given threshold value, alerting them that the child could be in danger. This helps the parents to locate and monitor their child's safety. The future work would be to further develop and implement the safety wearable device so that it could be sown into a fabric(clothes) that could be iron, using synthetic fibres again for which we will refer the papers that were surveyed on this paper.

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