SMART WEARABLE DEVICE FOR CHILD ABDUCTION PROTECTION USING IOT

1st Dr.T. Loganayagi, 2nd Lavanya.I,3rd Lavanya.P, 4th Lavanya.R

[1]Professor,[2,3,4]Student

[1,2,3,4]Electronnics and Communication Engineering

[1,2,3,4]Paavai Engineering College, Namakkal, India

Abstract - The main function of this system is to provide security to children. In today's world, children are not secure; they are facing many issues regarding their security. In order to reduce such problems Our child safety wearable device has been implemented. This system is user friendly and affordable. There are many wearable devices, including available in the market to track the child using IoT for communication between parent and child. In this system, we use the IoT as a mode of communication between parent and child, so there are fewer chances of communication failing as compared to existing system. It also includes a alarm to provide security to the child in real-time situations, and it helps parents check the condition of children using Android applications. The GPS is used to find the child's location in case of an emergency. This project includes various sensers such as heartbeat sensor, accelerometer sensor, and microphone (MIC) to meet several circumstances. The main objective of this project is to provide perfect security for the children and cover all safety aspects for women to save them from danger or emergency conditions.

Index Terms - IoT, GPS, Accelerometer sensor, Alarm, wearable device, child safety, abduction production.

I. INTRODUCTION

The purpose of this device is to offer children the safety of wearable bias. So, we apply "child safety wearable bias" using IoT. The Internet of Effects" (IoT) refers to the set of biases and systems that stay connected with real-world detectors and to the internet. There are two types of aspects to the detector using the different types of operation positions: presence, health position, status, safety, etc. This entails not only relating the child's position, but also analyzing its health and the twinkle in its eye when it is happy. All detectors are used for every analysis of child position and health position. The tool has the traits of inordinate trustworthiness, quick response time, and inordinate delicacy and might meet the demand to ensure children's safety. Safety cautions on humans, especially children, are a veritably concerning matter currently. Cases of baby hijacking take place regularly, in particular in public areas. A check has handed numerous contrivances that are advanced, similar to the operation of molecular phones, Android, and the Global Positioning System (GPS).

Using this technology, we're designing a wearable safety device for children's safety to cover a woman wirelessly using IoT-grounded real-time technology. Touch Me Not is an idea to design a similar device that can be attached to apparel. It'll be a button that will be attachable to the apparel. This button will be connected to the system, which has two modules, one of which can be used when someone makes some kind of attack by an adversary; also, a switch has to be pressed manually by her (which will be immaculately located at an accessible position on the body), which in turn will spark the microcontroller to spark the on-body GPS Tracker and simultaneously capture the image or videotape of the bushwhacker and transmit it via an RF module to another section where it'll be stored.

II. PROPOSED SYSTEM

The security of the child by using a wearable device is to help the parent locate their child easily, and the location can be sent to the parent's mobile phone using IoT. In this system, the GPS traces the location of a woman who is in a dangerous condition, and with the help of WIFI (IOT) through creating an IOT server or android app.
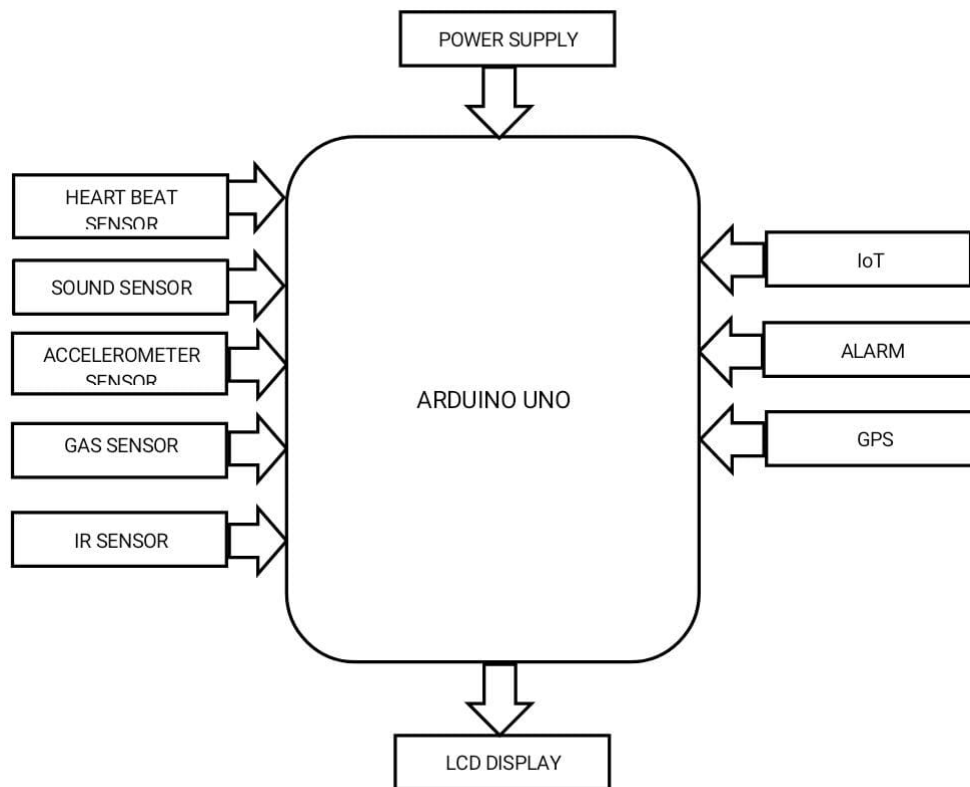
Figure.1 Block diagram of child abduction protection system.

When we detect any changes in the sensor that trigger this abnormal behavior, at that time the Arduino starts working, the first GPS trace is the location of the woman, and with the help of an IoT server or Android app, the will be sent to the police safety server and the parent's smart phone app. The accelerometer finds the angle of movement of women in case the women fall down or have an abnormal angle, and the heartbeat sensor finds the abnormal value of women. In all these emergency cases, we provide a safe haven for women. Initially, when our project detects the women in danger, the emergency alarm is activated first, and then we send an emergency message.

This block diagram explains how the device mainly works. It consists of the Arduino Nano, which plays the major role in the device. Heart beat A sensor is used for sensing the heartbeat measurement. An accelerometer sensor is used for measuring the acceleration of the object or body in the instantaneous rest frame. GC-MS plays a crucial role in that it includes drug detection, environmental analysis, etc. The proximity sensor is used for detecting objects. A sound sensor is used to detect the voice of the person, and lips are used to find the location. All the sensors will be fed to the Arduino Nano, on which all the functions work. Alarm mainly determines the alteration in the environment. An LCD display is used for displaying the details on the parents' phone.

III. EXPRIMENTAL SETUP

The security of the child by using a wearable device is to help the parent locate their child easily, and the location can be sent to the parent's mobile phone using IOT. The Internet of Things (IOT) refers to the set of devices and system that stay interconnected with real-world sensor and to the internet and the GPS traces the location of a woman who is in a dangerous condition, and with the help of WIFI (IOT) through creating an IOT server or android app. The numbers below show a block diagram representation of the system to be enforced.
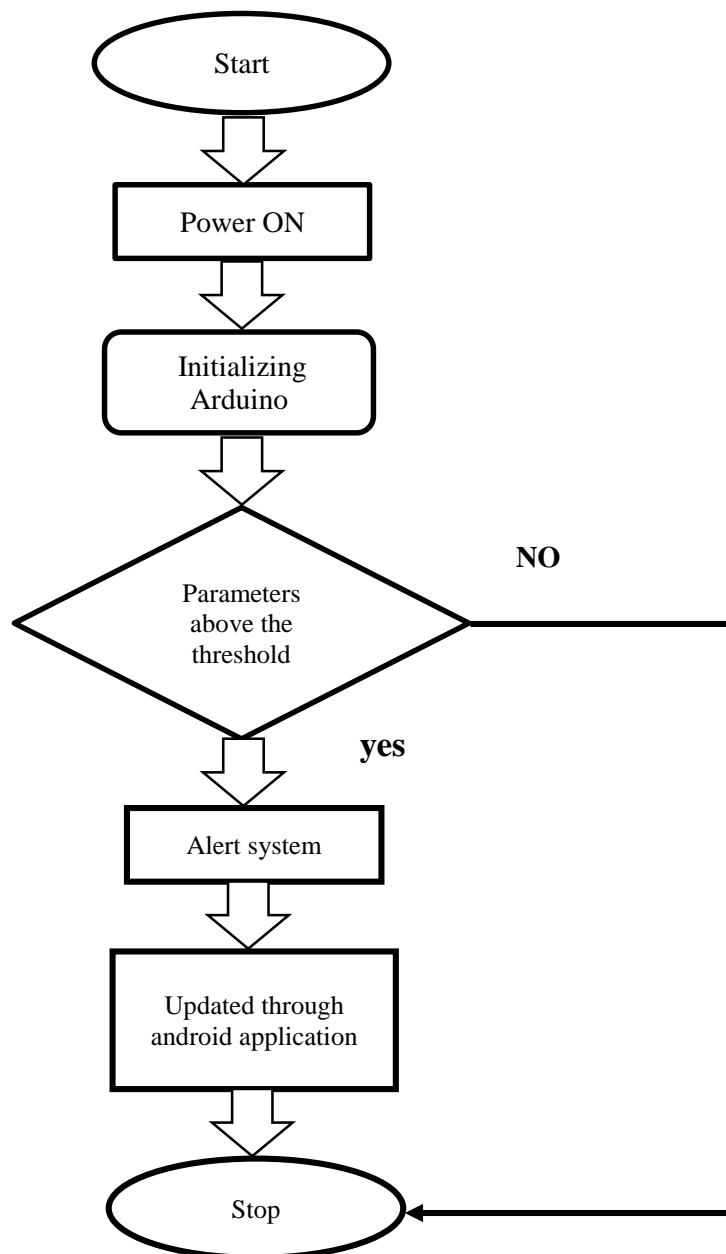
**Figure.2** Flow chart of the proposed IoT based child abduction system.

The device can be attached to the apparel, and when pressed, it performs the action of waking connections, including the named family member or friend as well as the police. The device enabled with the GPS system will be suitable to send the position to the connections. The device will be enabled with a camera, which will capture images and videos grounded on the detector, and these images will also be transferred to the connections.

The system is activated manually by a woman by flipping a switch in the event of an attack. This switch activates a microcontroller that activates an alarm on the body. The images are stored on a microSD card as evidence in court proceedings. The handheld controller receives location coordinates from the GPS receiver and sends them as an SMS message to a predetermined phone number.

The event of an attack, the system is activated manually by the woman by pressing a switch. This switch triggers a microcontroller that activates an on-body alarm. The microcontroller triggers the on-body camera and GPS module to capture the image and get the position independently. Images are stored on a microSD card as evidence for legal conduct. Hand-held regulator, when touched off, receives position equals from the GPS receiver and transmits these in the form of an SMS to the pre-decided phone number.

IV. RESULT AND DISCUSSION

A supportive device with a smart system has been used to converse if attacked. This system has the highest chances of reducing crime. Messages through GPS and IOT-based real-time technology are an additional way to help the individual. When using the Camera application in the future, the user's fear or anger must be considered, as this will generate a message to the control room and activate an alarm. The system can perform real-time monitoring of the desired area and detect violence with good accuracy.
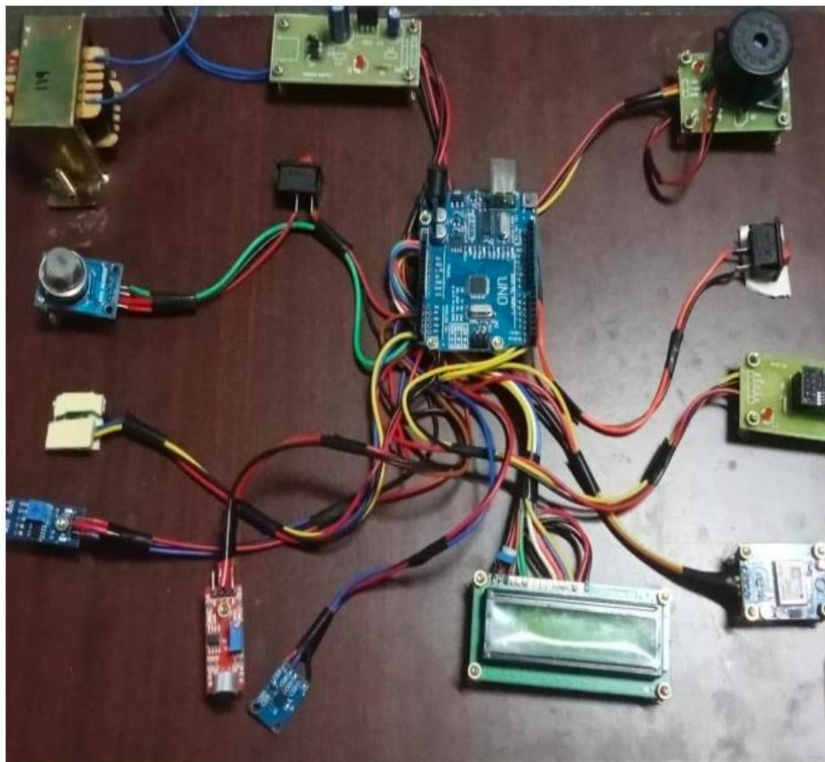
Figure 3 Experimental setup of smart wearable device.

The system is tested with different sensors and each sensor is tested with three children based on their activity. Test results for each sensor will vary**.** Separate sensor experiments such as heartbeat sensor actions, joy, sadness work well and for an angular accelerometer with different settings**.** The system is well done and various mobile alerts are tabulated.
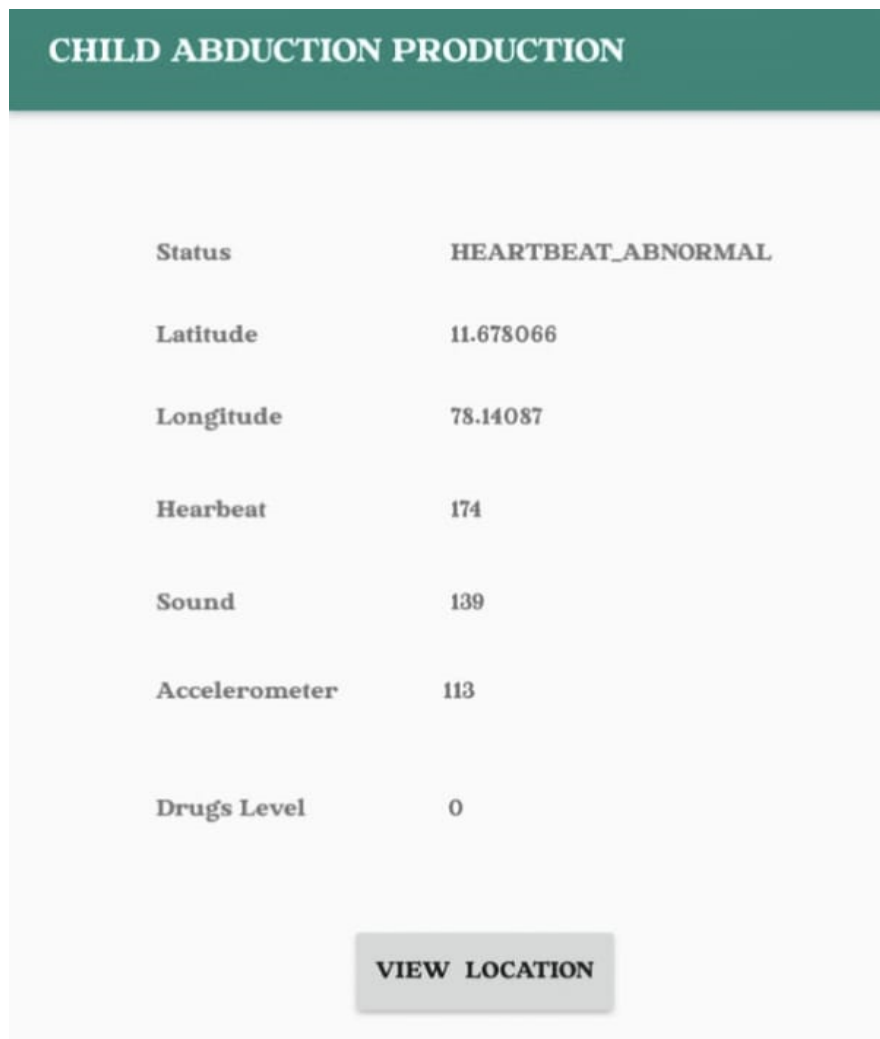
PERFORMANCE OF THE HEART BEAT SENSOR:

The heart beat sensor was tested on 3 children and performed well and the different types of actions were done by the children and monitored their heart rate. It keeps on tracking the children heartbeat. if the heart beat level of the children above 120, it indicates through the android application.

Table 1: Test result of the heart beat sensor

S.NO	CHILDREN	AT NORMAL	ACTION	HEART RATE (beats)
1	Children 1	72	Play	97
2	Children 2	70	Cry	105
3	Children 3	74	Panic	125

CHILD ABDUCTION PRODUCTION

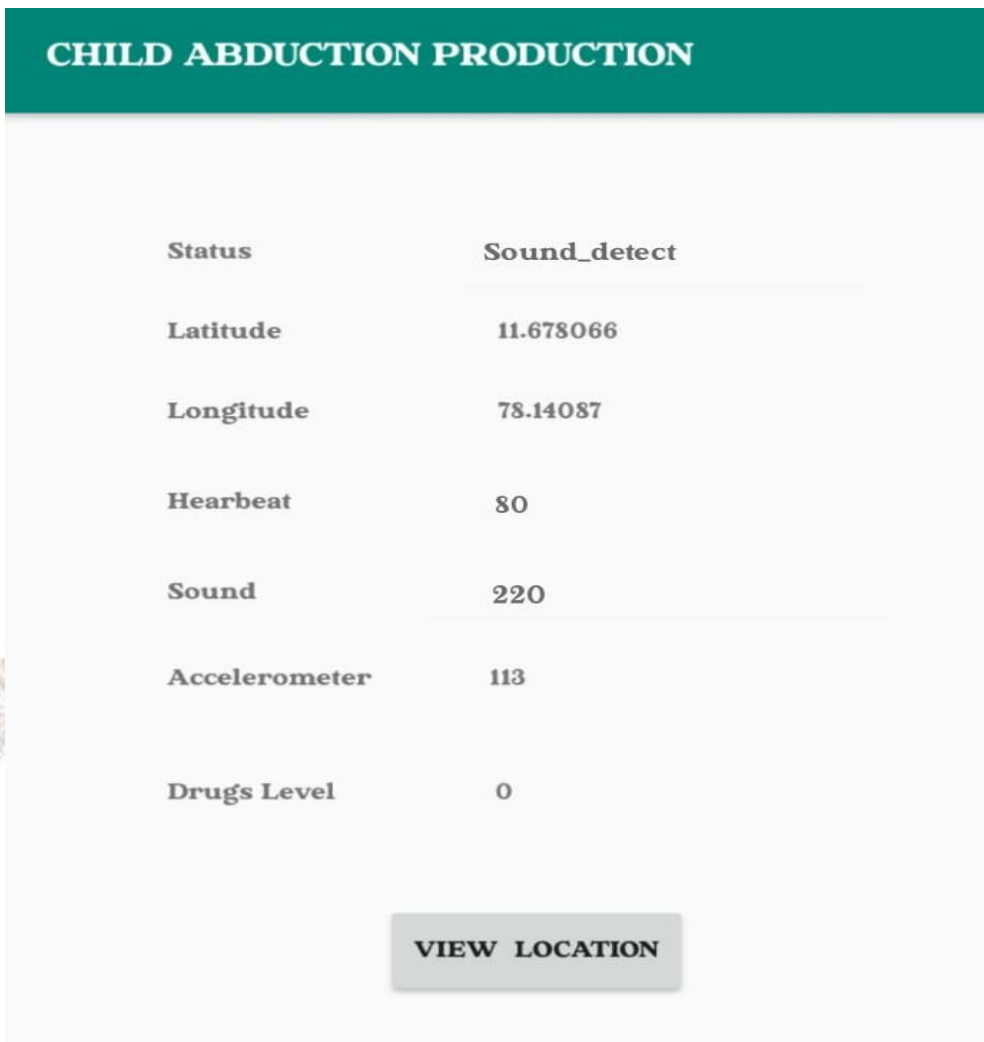| Status	HEARTBEAT_ABNORMAL
Latitude	11.678066
Longitude	78.14087
Hearbeat	174
Sound	139
Accelerometer	113
Drugs Level	0

VIEW LOCATION

Figure 3: screenshot of mobile application for heart beat rate abnormalities

PERFORMANCE OF THE SOUND SENSOR:

The sound sensor was tested on 3 children kind of action like crying, screaming and shouting. The Decibel level extend upto 200, it indicates through mobile application and the buzzer gives alert.

Table 2: Test result of the sound sensor

S.NO	CHILDREN	AT NORMAL	ACTION	SOUND LEVELS (db)
1	Children 1	90	Cry	180
2	Children 2	70	Scream	210
3	Children 3	82	Shout	170

CHILD ABDUCTION PRODUCTION

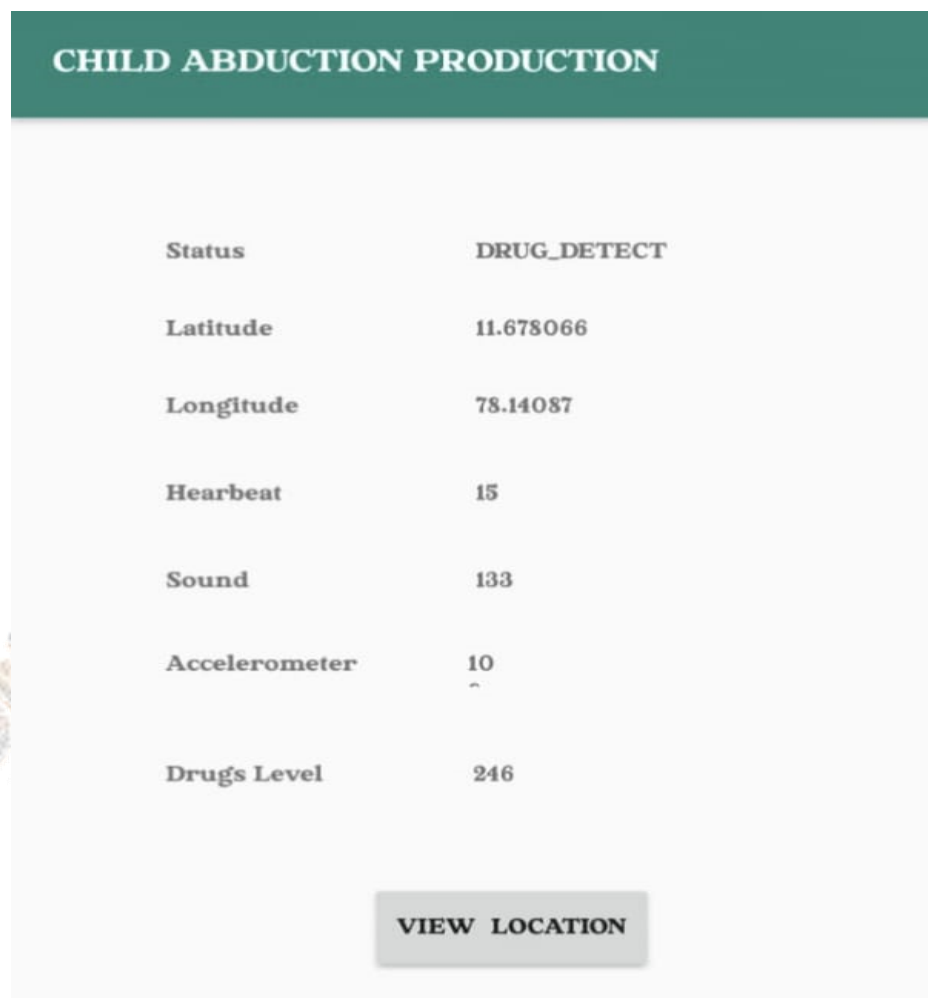| Status	Sound_detect
Latitude	11.678066
Longitude	78.14087
Hearbeat	80
Sound	220
Accelerometer	113
Drugs Level	0

VIEW LOCATION

Figure 4: screenshot of mobile application for voice abnormalities

PERFORMANCE OF THE DRUG SENSOR:

The drug sensor was tested on different alcohol content like marker, sanitizer and nail polish and the alcohol level was noted. Regarding the smell the drug level has varied. Other than these smells, the sensors can detect various kind of Narcotics.

Table 3: Test result of the drug sensor

S.NO	TYPES OF SMELL	DRUG LEVEL (PP)
1	Marker	160
2	Sanitizer	246
3	Nail polish	163

CHILD ABDUCTION PRODUCTION

Status	DRUG_DETECT
Latitude	11.678066
Longitude	78.14087
Hearbeat	15
Sound	133
Accelerometer	10
Drugs Level	246

VIEW LOCATION

Figure 5: screenshot of mobile application for drowsiness abnormalities

PERFORMANCE OF THE ACCELEROMETER SENSOR:

The accelerometer was tested on 3 children with different height level and position of the children and if the height level is above or below the certain level it indicates through the mobile alerts.

Table 3: Test result of the Accelerometer sensor

S.NO	CHILDREN	POSITION	HEIGHT (cm)
1	Children 1	Fall	51
2	Children 2	Uplifting	150
3	Children 3	Dumping	102

CHILD ABDUCTION PRODUCTION

Status	FALL_DETECTION
Latitude	11.678066
Longitude	78.14087
Hearbeat	0
Sound	142
Accelerometer	51
Drugs Level	0

VIEW LOCATION

Figure 6: screen shot of mobile application for posture abnormalities

V. CONCLUSION

Finally, we can see that the system is functioning properly. The system can perform the real-time monitoring and detect the violence with great delicacy. The various sensors are tested with children and system is performed well. This could help reduce the number of attacks on children while also making them feel protected and secure. The child safety device is capable of acting as a smart IoT device. It provides parents with the child's real-time position and surrounding temperature, along with a torture alarm buzzer for their children's surroundings, and the capability to detect their child or alert onlookers to act to comfort the child.

VI. REFERENCES

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