IOT WEARABLE DEVICE FOR THE SAFETY AND SECURITY OF WOMEN AND GIRL CHILD

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ABSTRACT

The main objective for this work is to create a wearable IOT device for the security and shielding of women, girl children. This is accomplished by the examination of physiological signs in concurrence with body gestures. The signs are analyzed and body temperature is measured by galvanic skin resistance. This work deals with body temperature and stress and skin resistance and relationship between them. By applying the records, activities persons position is analyzed. The device make an analysis of skin resistance and body temperature to analyze the situation of the person.

Key words: GSR, Human Activity recognition, Body Temperature, IoT, Machine Learning.

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1. INTRODUCTION

Internet of Things (IOT) is the latest technology that connects entire world. It establish connectivity (through internet) among the various devices or services or systems in order to little by little make automation development in all areas.

We being girls feel the exact need of the instrument at many situations. So we were very much keen to work in this area. We could relate ourselves being attacked in such situations and imagine how dreadful it can be for anyone to be in such situations. Rape is the one of the major crime in India practiced against Women. The crime rate is growing steadily since last few decades. This device makes a step forward and safes victims from such situations. The existing device requires manual operating by pressing emergency button on the device which will take action. The mental condition of girl children and women will not be normal under such drastic conditions and it is not idle and not possible for manual operating of button. When an person is encountered with a hazardous circumstance the adrenal gland acknowledges, a flight or fight condition and comes into action.
We have used some of the additional equipment to design the device, like:

- Temperature Sensors
- Triple Axial Accelerometer
- Skin resistance sensor

2. STATEMENT OF PURPOSE

This work field is all about to notice dangerous situation automatically without pressing any button, safeguard victim from criminal acts this can’t send message and GPS tracking not only when connected to internet, this can use nearby devices help like free Wi-Fi and Bluetooth signals. This field of work helps a lot of women about their safety and protecting. Practically if it gets work out then it will be one of the most demanded devices ever in the entire world. The following work done by us will answer to the questions like:

- How can the device be used when the individual wants to go to a remote place and need protection required.
- What if at that point of moment the individual cannot press the button for safety call. How can a victim be reached without pressing of the buttons.
- How the large device can be integrated in such a way so that the total size reduces.

2.1. Basic Description of Project

Hardware

Hardware mainly consists of the different sensors,
- Temperature Sensor (LM35)
- Triple Axis Accelerometer (ADXL335E)
- Skin Resistance sensor (Copper Strips):
  - The Copper strips take up raw indications through the subject’s bodies, and hence have to go through conditioning and achieve firmness earlier being directed to the controller. The circuit demonstrates the procedure of attaining the above purpose.

![Voltage divider circuit with LM324](image)

**Figure 1** Voltage divider circuit with LM324

ESP8266 Wi-Fi Module

- ESP8266 has been engaged as its readily available in the market as well as its economic benefit.
ESP8266 has been constructed to direct unremitting sensor data to an Open Source Cloud Platform—ThingSpeak AT Mega 328P.

The key controller is employed to direct the required data consistently to Cloud through the Wi-Fi segment.

**Software**

As we know that ATMega 328P chip has automated to endlessly directly sends data collected by sensor to ThingSpeak, which is a Open Source Cloud Platform, through the Wi-Fi module(ESP8266). It can be made by ArduinoIDE. Data is endlessly nourished to the cloud, that is concurrently received by the MATLAB to accomplish investigation. It has to be verified that subject is comfort or irritated. It has to be first examined that resistance and temperature to do this. This is done by a machine learning toolkit names Weka. A large data for training 50 diverse topics are taken between two lessons they are worried and comfortable. Body temperature and Galvanic skin resistance statistics are drawn and used for training. For the period of examination using MATLAB, the data obtained are uninterruptedly observed and send into a data file. The training is done by the data which we gave as input. If expectations disclose that person is worried, action acknowledgement is preceded. Simultaneously, the data is classified

MATLAB sends a tweet to the caretaker of the subject, indicating alert. This is achieved by using the ThingSpeak Tool Kit in MATLAB.

- VDC will be varied from situation to situation, while heavy breath it will be decreased and also while sweating. Skin conductance will be increased a lot during stress which will lead to decrease in skin resistance and voltage.
- It is known that different bodies will have different VDC in various situations, so we can’t decide fixed threshold to determine the state of body.
- Artificial intelligence help this device to analyze exact situation by analyzing a lot of input data given in table taken from various situations and from different bodies. So that it can trigger alarm button only in required situation which will reduce in false analyze..
3. EXPERIMENTAL INVESTIGATIONS

There already exists a model called Suraksha that has the same objectives as stated above. The main objective is safety of women and this device ensures (or) at least tries to ensure it by providing a stress switch/button, which when pressed sends out a distress signal. The idea of using Galvanic Skin Response sensors comes very handy and gives promising results. These mechanisms are used to monitor and analyze the amount of electrolytes present on the surface of our skin. In stressed conditions, these electrolytes and the blood flow increases resulting in decrease of our skin resistance and increasing electrical conductivity. Activity patterns too have a role in detecting these stressful situations. In this work we attempted to recognize activities by using a single triaxial accelerometer worn on the hand. The previous existing device is trained by analyzing values taken while sleeping, seating, struggling and they are used to train the device to work properly. This will create a decision tree and decision table which will give true results.

3.1. Experimental Results

Suraksha the device used for safeguarding women and girl child has flaws as well.

The major flaws cold be stated as:

- The device is needed to be divided into 5 different parts which has to be fitted into five different body parts.

So due to this there is a probability of huge discomfort in using the device always. And even if one part of the device gets crashed by an means hen the entire setup gets dysfunctional and has no use further.

- another major problem is the manual pressing of the button. It is not always possible for any individual to react to situations like that so aptly and hence there arises another bane.

- the next problem is that without internet connection it won’t work. Since it is not necessary always that there is the presence of the internet connection at all places so if in remote places any individual want to access the device it is not possible.

4. DISCUSSION OF RESULTS

The already existing device is divided into 5 different parts so we have to integrate it and after integrating all the 5 parts it has to result in a single device i.e. we have to reduce the complexity of the device and make it more comfortable to use.

The device should be designed in such a way that it an be attached to any of the cloth or accessories, so that it will be easy to carry and nobody can notice it if it is carried by a girl.
• It should be able to since i.e. as in Suraksha the user needs to press the button to activate it that can be impossible at some point of time. so the device needs to since the negative activities happening in the body parts of the victim and response as fast as possible.

• The response should be really fast. The numbers feed to send the notification should get the response at correct time so that the person can react on time.

• It should work without internet too. Not every place can have a good internet connection so we have to design the device such that it can work even without internet. now it can work at anyplace without any internet connection.

5. SUMMARY AND CONCLUSION
5.1. Summary
The paper consists of all the details of the rape and violence happening in the society against women. It also have all the recent records of the incidents happening in the country.

It also defines the already existing device Suraksha which is used to protect the girls from this situation but we analyze that the device is not upto the mark so we need to modify the device fixing all the faults.

We have also discussed about the modification which can be made in the device to make it more usable.

5.2. Conclusion
We encountered all the problems in the Suraksha and we found some ways to fix it:-

• using of entrant instead of internet. It will be more easy to response as it will keep on tracking the negative responses happening in the body of the user,

• reducing the complexity of the device, as the device is divided into 5 different parts we are going to integrate it to make a single device.

REFERENCES


