

WOMEN SECURITY SYSTEM USING IOT

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Abstract - As we know the present era is with equal rights, where in both men and women are taking equal responsibility in their respective works. Because of some reasons' women can't step out of their house. The Women Security System consists of an on-site deployment of an IoT module that is used to monitor and signalize the state of each individual which enables the user to convey information about their location, and if they are in danger the information is conveyed to the respective officials and house members. These systems use effective sensors, by tracking information from various sources and also deployed active data processing units. Here our proposed idea is implemented using WIA cloud and TWILIO Communication API so that the corresponding officials or end users could get the information via Wi-Fi or Internet. It mainly focuses on reducing the crimes against women which might destroy their lives.

Key Words: Women Security, Internet of things (IOT), WIA Cloud, TWILIO API,

1. INTRODUCTION

IOT technology grows in various fields of smart applications but we have not yet found boundary constraints of this technology. Some smart applications which it has implementing currently such as on smart grids, smart lighting, smart energy, smart city, smart health etc. [4]. Because of some reasons' women can't step out of their house. The only thought haunting in every woman's mind is when they will be able to move freely on the streets even in odd hours without worrying about their security. In critical situations the women will not feel insecure or helpless if they have some kind of safety device with them. Here are some reasons why we need a women security device:

- About 10% of all the crimes committed in the country are those of women abuse.
- A woman is raped every 20 minutes in India
- One in three ever married women report having been slapped by their husband.

- Around two-third of married women in India are victims of domestic violence.

1.1 EXISTING SYSTEM

1. SHE (Society Harnessing Equipment): It is a garment embedded with an electronic device. This garment has an electric circuit that can generate 3800kV which can help the victim to escape. The garment delivers an electric shock to attackers strong enough to cause severe burns, protecting the victim from any of the electricity.

2. ILA SECURITY: The co-founders of this system, have designed three personal alarms that can shock and disorient potential attackers and hence safeguard the victim from perilous situations.

1.2 PROPOSED SYSTEM

We propose to have a device which is the integration of multiple devices, hardware comprises of a "Smart gadget" which continuously communicates with the cloud and API. The complete gadget also ensures to provide self-defense application which helps her to escape critical situations. This system can be used at places like bus stops, railway stations, offices, footpaths, shopping malls, markets, etc. The status of the individual is monitored continuously in real time and the information is updated. Using the data, we can identify patterns and reduce crimes against women.

2. LITERATURE SURVEY

In today's world women are less secure, they are facing a greater number of situations like kidnapping, rape case, & abuse. Because of these reasons' women can't step out of their house. The prime question in every Woman's mind, taking into account the ever-rising increase of issues on women harassment in recent past, is only about her safety and security. The only thought haunting every Woman's is when they will be able to move freely on the streets even in odd hours without worrying about their security. When such incident happens with women's they will not feel insecure or helpless if they have some kind of device with

them. With the help of these devices girls & women can stay out without any fear at any time [1].

At the present scenario Women are competing with men in every prospect of society. Nowadays, women and children safety are a prime issue of our society. The count of the victim is increasing day by day. Women contribute fifty percent to the development of our nation. But the women have fear of getting harassed and killed. All these types of women harassment cases are increasing day by day. So, it is very important to ensure the safety of women [3].

Women security is a major issue of concern in today's world. Women are subjected to unethical physical harassment. Women safety methods such as various mobile apps have been tried and implemented, but the need of the time is that they need is a device that can be carried everywhere easily. The idea to develop a smart device for women is that it's completely comfortable and easy to use as compared with already existing women security solutions such as a separate garment, bulky belts and in famous mobile apps that are just very abstract and obsolete. If a woman is subjected to attack by an adversary, then a switch has to be pressed by her, manually [5].

3. SOFTWARE AND HARDWARE REQUIREMENTS

3.1 SOFTWARE AND CLOUD REQUIREMENTS

1. Python

Python is an interpreted high-level programming language for general-purpose programming. Python is a multi-paradigm programming language. Object-oriented programming and structured programming are fully supported, and many of its features support functional programming and programming.

- It is used in Web and Internet Development, Software Development and Business Applications.
- It has many more applications as it has features like Multiple Programming Paradigms.
- Compatible with Major Platforms and Systems and Robust Standard Library.

2. WIA Cloud

Wia is a cloud platform that enables users to build a scalable and powerful backend to launch their Internet of Things (IoT) solutions. This allows makers, startups and enterprise users to create a fully-fledged, production ready solution in just minutes without having to worry about server management, data replication and storage. In

addition to this, Wia offers users device management, events collection, analytics and highly customizable push notifications. Wia is a cloud platform that enables users to build a scalable and powerful backend to launch their Internet of Things (IoT) solutions. One can publish events and subscribe to commands via our REST, MQTT, and CoAP APIs

3. Twilio Communication API

Twilio is a cloud communications platform as a service (CPaaS) company based in San Francisco, California. Twilio allows software developers to programmatically make and receive phone calls, send and receive text messages, and perform other communication functions using its web service APIs. Twilio uses Amazon Web Services to host telephony infrastructure and provide connectivity between HTTP and the public switched telephone network (PSTN) through its APIs. Twilio follows a set of architectural design principles to protect against unexpected outages. Twilio supports the development of open-source software and regularly makes contributions to the open-source community. Twilio lists a number of other open-source projects on their website including: Flask Restful:

- Python Flask (web framework) to build REST APIs.
- Shadow: Runs requests through a release candidate with real production traffic.
- Banker's Box: Wrapper for storage backend.

4. Geocoder

Geocoding is the computational process of transforming a physical address description to a location on the Earth's surface (spatial representation in numerical coordinates). Reverse geocoding, on the other hand, converts geographic coordinates to a description of a location, usually the name of a place or an addressable location. Geocoding relies on a computer representation of address points, the street / road network, together with postal and administrative boundaries. Geocoder is a simple and consistent geocoding library written in Python. Dealing with multiple different geocoding provider such as Google, Bing, OSM & many more has never been easier.

3.2 HARDWARE REQUIREMENTS

1. Raspberry Pi

The Raspberry Pi is a series of small single-board computers developed by the Raspberry Pi Foundation. The

first-generation Raspberry Pi 1 Model A was released in February 2013. Raspberry Pi 3 Model A+ was released in February 2018 with a 1.2 GHz 64-bit quad core processor, on-board Wi-Fi, Bluetooth and USB boot capabilities. Raspbian is a free operating system based on Debian GNU/Linux and optimized for the Raspberry Pi hardware. Here we are using Raspberry Pi 3A+. It has 40 GPIO pins which are available to us.

2. Vibration Sensor

A vibration sensor is a type of accelerometer. A vibration sensor typically contains a piezoelectric crystal element bonded to a mass. When the accelerometer is subject to an accelerative force, the mass compresses the crystal, causing it to produce an electrical signal that is proportional to the level of force applied. The signal is then amplified and conditioned using inbuilt electronics that create an output signal, which is suitable for use by higher level data acquisition or control systems. The Vibration module based on the vibration sensor SW-420 and Comparator LM393 to detect if there is any vibration that beyond the threshold. The threshold can be adjusted by the on-board potentiometer. When this no vibration, this module output logic LOW the signal indicates LED light, and vice versa.

3. Jumper Wires

A jump wire is an electrical wire, or group of them in a cable, with a connector or pin at each end, which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering. Jumper wires are wires that have connector pins at each end, allowing them to be used to connect two points to each other without soldering. Jumper wires are typically used with breadboards and other prototyping tools in order to make it easy to change a circuit as needed [2].

4. Touch sensor

A touch sensor is a type of equipment that captures and records physical touch or embrace on a device and/or object. The Touch Sensor are sensitive to touch, pressure as well as force. The Touch Sensor works similar to that of a simple switch. When any physical medium comes in contact with the touch surface. The internal circuit will be closed inside the sensor and current starts flowing. On the other hand, when this physical contact is broken or released, the circuit will be opened. The TTP22301 Digital Touch Sensor Capacitive Touch Switch Module is used in this project. The Capacitive touch sensors are very popular since they are more robust, durable and user friendly.

Moreover, it is also cost-effective when compared resistive touch sensors. The capacitive sensor is made just similar to the normal capacitor. There are two conductors separated with the insulator.

4. SYSTEM DESIGN

4.1. BLOCK DIAGRAM

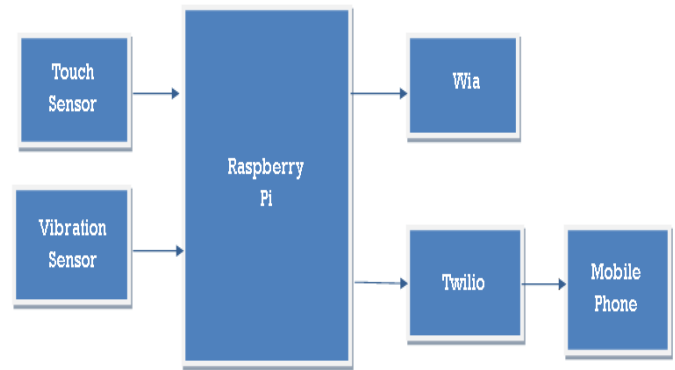


Fig 1: Block Diagram

4.2. FLOW CHART

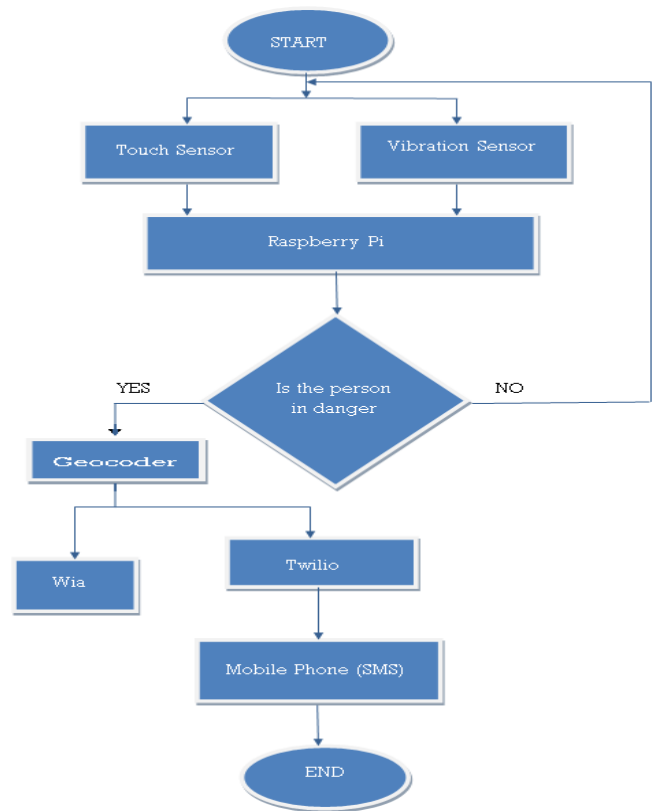


Fig 2: Flow Chart

5. IMPLEMENTATION OF THE SYSTEM

1. If using a new SD card then download NOOBS from the official raspberry pi site. Extract and copy the files in a SD card of size ranging from 8GB to 32 GB to install Raspbian on the SD card.

2. Place the SD card in the provided slot. Plug in the power supply, now select Raspbian to install it. It will take a while. After the installation is complete setup up your Raspberry pi.

3. Download geocoder, Twilio and Wia installation files from Github. Install the mentioned software's in your raspberry pi by using the terminal.

4. Create an account in Twilio and register the mobile numbers on which you are sending the messages.

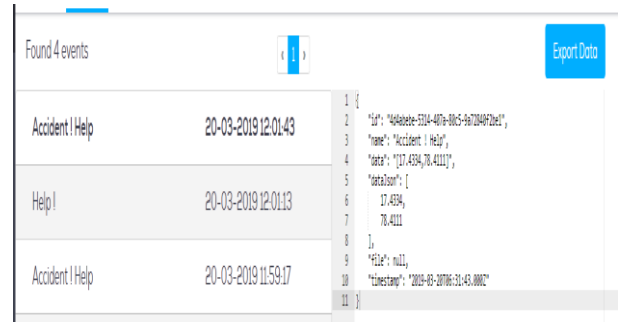
5. Create another account in Wia cloud, create a space and add your device.

6. Connect the vibration and touch sensors to the raspberry pi.

7. When a person touches the sensor or if the vibration sensor detects a big vibration the geocoder gets the location using the IP address and then sends the data to Wia cloud to store the information and view it graphically. Then the location is sent to mobile phones of the desired personals through Twilio communication API.

6. RESULT AND DISCUSSION

This designed women system which is simple, economic and provides effective solution to reduce the crimes against women and increase the feeling of safety among them. It is well managed to access and map the status of location from any remote location. Figure 3 shows the database of Wia cloud. Figure 4 shows the map which is plotted by the Wia cloud from the coordinates derived from the geocoder which are sent to it when a person touches the touch sensor or when a big vibration is detected. Figure 5 shows the SMS which is received through the Twilio API. Finally, figure 6 shows the system itself.



Event Name	Timestamp
Accident! Help	20-03-2019 12:01:43
Help!	20-03-2019 12:01:13
Accident! Help	20-03-2019 11:59:17

```

1 {
2   "lat": "17.425340000000000",
3   "name": "Accident! Help",
4   "meta": {"[17.4534,78.4111]",
5   "station": [
6     17.4534,
7     78.4111
8   ],
9   "file": null,
10  "timestamp": "2019-03-20T06:31:43.000Z"
11 }

```

Fig 3: WIA Cloud Database

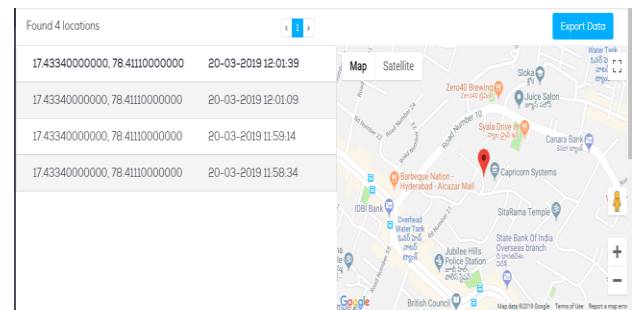


Fig 4: WIA Cloud Maps

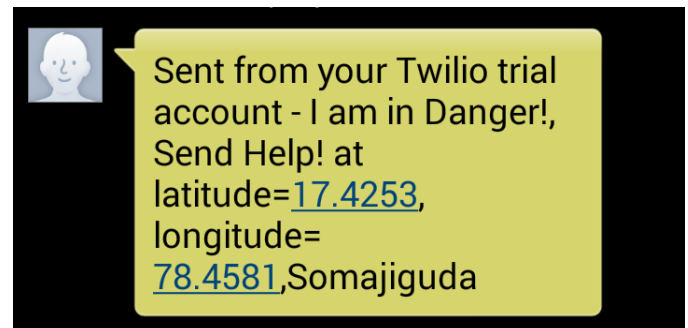


Fig 5: SMS received on mobile phone

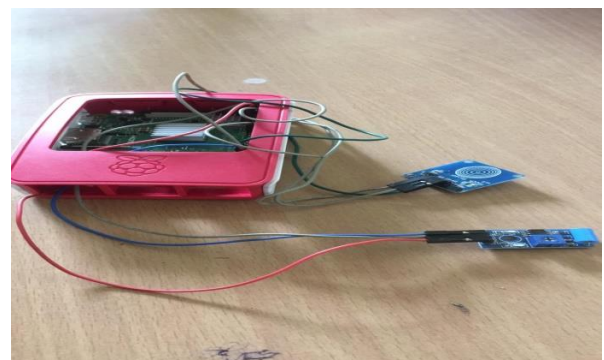


Fig 6: Hardware

7. APPLICATION AND ADVANTAGES

7.1 APPLICATIONS

- The system can be used at places like bus stops, railway stations, offices, footpaths, shopping malls, markets, etc.
- It can be carried anywhere, and the location of a person in danger can be recovered and necessary actions can be taken.

7.2 ADVANTAGES

- Reduced crimes
- Enhanced User Experience
- Increased Safety
- Real-Time Data and Trend Insight
- Increased self-confidence
- A decreased feeling of vulnerability
- Reduced risk of being victimized
- Improving overall personal safety

8. CONCLUSION AND FUTURE SCOPE

8.1 CONCLUSIONS

- Our primary goal of this project is to ensure every Woman in our society to feel safe and secured. According to the survey in India 53% of working women are not feeling safe.
- Implementing real time application and a device, we can solve the problems to an extent. With further research and innovation, this project is used as a small wearable device like watch pendent etc. security is an upgraded version of security device which works with both hardware and software.
- The innovative idea is that it led with nearest neighbor technology by which we can contact with our nearest person at emergency time. It is very relevant and easily accessible system model.

8.2 FUTURE SCOPE

- Communication through GPS & GSM technology is the supplementary part to have help to the person.
- In future to have legal process video information can be sent to the cops, State & Central Govt. to have immediate punishment to the criminal.

- The system will also be helpful to all people those who are in remote area for their protection against criminal problems etc. This system can overcome the fear that scares every woman in the in city about her security and safety.

9. REFERENCES

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