

SMART IoT DEVICE FOR WOMEN SAFETY

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ABSTRACT

At present women safety is a major issue in our country. Everyday we hear about the news of women abuse & harassment. Most of the people are ready to save women when they hear about women harassment. So we are creating an IoT device which can ensure safety to women with people's help. The people who are ready to save a woman/girl can register themselves to a website. The registered details are stored in a database. Our proposed system has a force sensor which can be triggered by women when she encounter any problem. The GPS module gets the current location of women. When a force sensor is triggered the victim's location is sent to registered people, parents, and police. We are running the entire system by using Raspberry Pi. We used Python programming language as an intermediate between sensors and hardware.

Keywords: Women safety, IoT, Raspberry Pi, Force Sensor, GPS, Database.

1. INTRODUCTION

Now-a-days Internet of Things is connected with our daily activities and it has become a part of our lives. With the advancement of sensor technology, availability of internet connected devices make IoT devices to act smart devices in emergency situations without human intervention. IoT is used in almost every

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field such as sensing, Networking, Robotics. As technology advances IoT will become a part of our day to day life. Through IoT Humans save time, resources and human power by providing the real time services without any intervention of humans.

At present women are equal with men in every aspect of work. Women's contribution to the development of our nation is immense. But we are living in a society that can't ensure safety to women. The crimes against women are increasing abruptly. This paper proposes an alert based system that is able to track the present location of women. The system sends location to registered people[who pledged for women safety,police and parents. Our system provides a smart solution that can definitely ensure safety to women.

2. METHODS

2.1 Related Works

Many applications have been designed for ensuring safety to women but they can't provide a complete solution to the problem. Some of them are: One system sends the current location of women to parents and police stations when the panic button is pressed. Some other systems send location to police when their heart beat increases through heart beat sensor. Many other researchers did a lot of research work for tracking systems, It was a basic system to send location of the user by using GSM. Other IoT based device provides the current location of women on a web server. Other IoT devices use GPS and pressure switches. Whenever a switch is pressed the current location is sent to emergency contacts. The main drawbacks with the current devices are, the medical related sensors are not giving accurate results. Whenever a woman sees any accident then heartbeat rises then location is sent to parents even if there is no problem. Suppose if the victim is far away from the police station and parents then they can't reach the location within time. By perceiving the news of women abuse and harassment many people feel that if they were at the location they can readily save the girl. So we proposed an idea that can definitely ensure safety to women by the people who are ready to save the woman. We developed a Raspberry Pi system for the first time which provides location of victims to all the registered people.

2.2 Proposed Methodology

We created an IoT device that can definitely ensure safety to women. If a woman feels any problem she can just press the force sensor then the Raspberry Pi system sends the current location of women to all the registered people, parents & police. The components present in our system are Raspberry Pi, Force Sensor, AD Converter, GPS, Web Application, SMS Gateway, and Database. The block diagram is shown in Figure 1.

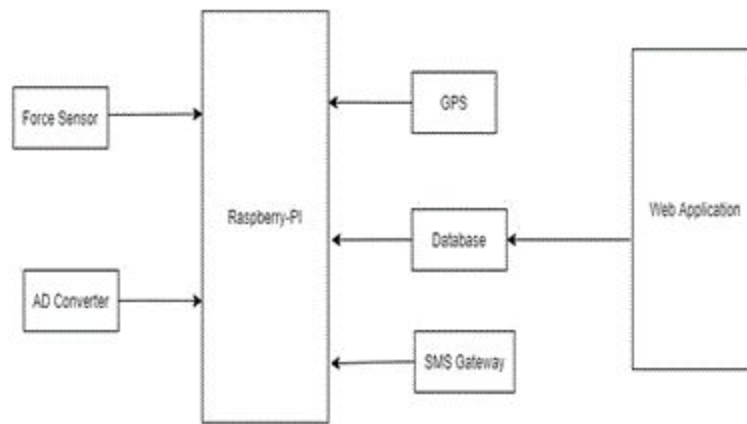


Figure 1:Block Diagram

2.2.1 Hardware Components:

i) *Raspberry Pi*

Raspberry is a small sized computer that can be connected to a display unit, it can be either a computer monitor or projector. It can perform anything that you expect from a desktop computer to do.

ii) *GPS*

GPS is a navigation based system that is used to determine the current position of an object in terms of latitude and longitude. There are 24 satellites deployed in space which surrounds the earth. This satellite broadcasts the position of an object. GPS uses a triangulation process to obtain the exact position of an object. The GPS module is connected to Raspberry Pi through GPIO pins.

iii) *Force Sensor*

The Force Sensor material resistance varies when any force or stress is applied on it. The conductive polymer is responsible for changing the resistance inside the material. The Force sensor is connected to a digital convertor which in turn the digital converter is connected to Raspberry Pi GPIO pins.

iv) AD Convertor

Basically the input from the force sensor is an analog signal. So in order to convert it into digital signal we use Analog to Digital converter. It takes Analog signal as input from force sensor and sends digital signal as output to Raspberry Pi.

2.2.2 Software Components:

i) Web Server

UwAmp is a free web server that can be installed on a local PC. UmAmp has the following components such as Apache, MySQL, PHP and SQLite. We have to start the server if we want to work. After starting the web server we can add any web pages. The local database stores the details of the registered people.

ii) SMS Gateway

SMS Gateway is used to dispatch multiple messages to several people from a web browser. It can also provide international messaging service gateway with roaming facility.

iii) Python

Python programming language is used as an interface between Raspberry Pi, Sensors and Database. Python is a flexible programming language with short code and it has multiple libraries. The interaction with Sensors and Raspberry Pi is easy with python programming language.

2.3 Procedure

Whenever the Raspberry Pi system is connected to a power source, the Operating system gets loaded with a green signal blinking on it. Then all the connected components are initialized. The Flowchart of our proposed system is furnished in Figure 2.

Explanation:

Step 1: The users who are willing to help women can readily register themselves to a website by providing their details. The details are stored in a database.

Step 2: Whenever women feels any problem she can just press the force sensor

Step 3: The input from the force sensor is read into an AD converter there after the signal is transferred to the Raspberry Pi system.

Step 4: The Raspberry Pi system gets the registered phone numbers from the database.

Step 5: The GPS module gets the current location of the victim when it is triggered by the Raspberry Pi system.

Step 6: Finally the SMS Gateway sends the location of the victim to all the registered people, police & parents.

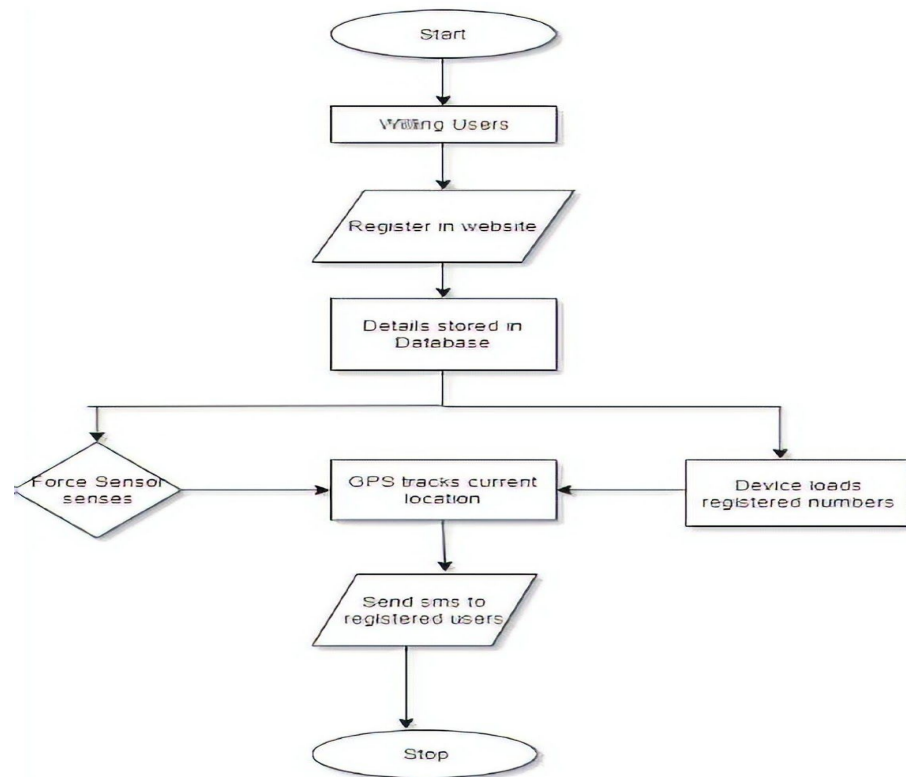


Figure 2:Flowchart

3. RESULTS

By using VNC Viewer we can affix Raspberry Pi remotely. We have to provide the IP address of Raspberry Pi to VNCViewer. From VNC Viewer we can perform any operations on Raspberry Pi. Whenever the force sensor is activated then it sends an alternative signal to the AD converter, the AD converter sends a digital signal to Raspberry Pi. When there is an input signal from an AD converter the system gets the location from the GPS module. When program is executing the current location link is sent to sms gateway. It is shown in Figure 3.

```
>>> %Run siws.py  
  
16.5995 49.6673  
http://maps.google.com/?q=16.5995,49.6673  
Sent.c.
```

Figure 3: Sending Current Location

SMS Output

The Raspberry Pi system gets the Contact numbers of all registered persons, thereafter it sends the current location of victim to registered numbers. The SMS to registered people is shown in Figure 4.

Figure 4. SMS to all registered contacts.

CONCLUSION

This paper mainly focuses on providing safety to women. Our main theme is to ensure safety for every woman so that they can do their work at any time without fear. So “SMART IOT DEVICE FOR WOMEN SAFETY” is set up for preventing threats to women in our society. It works on, when the force sensor gets activated by the women then the signals are transmitted to Raspberry Pi, then it collects the registered users data and sends an alert message through SMS gateway along with the location using GPS. The users can readily save the victim.

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