SMART PERSONAL SAFETY DEVICE USING IOT

PROJECT REPORT

Submitted by

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to

APJ Abdul Kalam Technological University

In Partial fulfilment of the requirements for the award of Degree of

Bachelor of Technology

in

Electrical and Electronics Engineering

Department of Electrical and Electronics Engineering

UKF College of Engineering and Technology Parippally,

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2. Flexible and adaptable in the workplace, possess the capacity to seize new opportunities of emerging technologies, leadership, and teamwork, all affording sustainable engineering careers.
3. Act with global, ethical, societal, ecological, and commercial awareness expected of practicing engineering professionals.

DECLARATION

We Undersigned hereby declare that the project report **"SMART PERSONAL SAFETY DEVICE USING IOT"** submitted for partial fulfilment of the requirements for the award of degree of Bachelor of Technology of the APJ Abdul Kalam Technological University, Kerala is a bonafide work done by me under supervision of Mr's Ashida Pradeep. This submission represents our ideas in our own words and where ideas or words of others have been included. We have adequately and accurately cited and referenced the original sources. We also declare that we have adhered to ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in our submission. We understand that any violation of the above will be a cause for disciplinary action by the institute and/or the university and can also evoke penal action from the sources which have thus not been properly cited or from whom paper permission has not been obtained. This report has not been previously formed the basis for the award of any degree, diploma or similar title of any other university.

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CERTIFICATE

This is to certify that the report entitled "**SMART PERSONAL SAFETY DEVICE USING IOT**" submitted by **ADWAITH SHAJI(UKP20EE005), GAYATHRI V.S.(UKP20EE014), MITHRA M. LAL(UKP20EE019)** to the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the awards of the Degree of Bachelor of Technology in Electrical and Electronics Engineering is a Bonafide record of the project carried out under our guidance and supervision.

Project Supervisor	Project Coordinator	Head of the Department
Asst Prof. Ashida Pradeep	Dr. Sreeja P.	Dr. Sreeja P.

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ADWAITH SHAJI
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MITHRA M. LAL

ABSTRACT

Our goal is to identify the rapid advancement of science and technology and our heavy dependence on technological features, a solution to this important problem for women. We are focussing to make a smart personal safety device that helps womens and all people who need help or an extra security. This project not only helps womens but also helps children, old age people, disabled people. The design supports a smart location and tracking system and alert notification, GPS, GSM, audio video recording facility, and a face-recognition image capture system and to minimize the weight of the model, we implemented Li-Ion battery. The high-quality camera and voice recorder cooperate with GSM system and send the visuals and recordings to nearest police station or relatives. It stores the visuals and recordings in cloud storage for legal purposes. The suggested model also includes an electric shock with a wireless system activator and a siren. The design features have been carefully considered and confirmed to provide women with the best safety tool available.

CONTENTS

LIST OF FIGURES

ABBREVIATIONS

ESP32	Espressif32
GPS	Global Positioning System
GSM	Global System for Mobile Communication
LI-ION BATTERY	Lithium-Ion Battery

CHAPTER 1
INTRODUCTION

The topic of women's safety in India is a big one these days. Considering the recent crimes against women, particularly in the national capital, we cannot conclude that women are safe in India. When leaving the house alone, most women experience fear. The country's female citizens constantly live in fear, which is a very sad reality. Women's personal safety has long been a concern for all Indian citizens. Although there are many women's safety systems on the market already, more advanced systems are still needed to offer greater safety and security. A smartwatch, the Nirbhaya app, the Vith U app, and a smart belt are just a few of the devices and apps available for women's safety.

The Nirbhaya app, which was made available by the Uttar Pradesh police is intended to improve the safety of women in India. With a single touch, it calls or sends an SMS alert to the pre-selected contacts with the precise location. Every 300 meters you move, it updates. When the woman shakes the phone, it also turns on. Therefore, in this project, a wearable carry bag is proposed as an alternative method for women's security that might be a better option than the rest of the security measures already in place. Here, the system uses an IOT and GPS-based intelligence-based security system to meet the needs and demands of victims of crimes against women. Since such an incident cannot be predicted, it is best to use an enabled Arduino UNO microcontroller. Women are more secure and safe thanks to this device. This paper proposed an IOT-based intelligence-based security system to meet the needs and demands of victims of crimes against women. Since such an incident cannot be predicted, it is best to use practical tools Personal safety system.

The project's primary goal is to develop a new system employing Raspberry pi, GSM, and GPS technology. Those who are threatened can respond quickly thanks to this equipment. This system makes a negligible impact to reducing numerous crimes against women. The victim can

push the wireless button, or the system will activate automatically by sensing the pulse rate sensor to send the victim's live location the video and audio evidence of the place to the nearby police station and relatives during an emergency involving harassment. The wireless button, camera module microphone module, GPS module, and GSM module are all connected to this new system. Here we are using the raspberry pi 4b board as the central board for controlling the whole components.

1.1 OBJECTIVES

- For recording video and audio of attacker and to store it on cloud storage.
- Installation of a high-quality camera for better visual.
- Li-ion battery package for compact size and fast recharging.
- GSM and GPS system to navigate real time location and to suddenly send emergency message to nearby police station or family.
- To provide legal help in courts or police station.
- To provide instant action towards the attacker.

CHAPTER 2
LITERATURE REVIEW

2.1 P. Madhavi, Bobbili Roshini, Pokalkar Akash "Smart bag for women safety system,"

This paper includes a face recognition image capture system, GPS, and a smart location tracking system for women safety. The proposed system has a siren and an electric shock. The main advantage of this prototype is an application named BLYNK is used to receive an alert notification when the panic switch is in on position disadvantages are There is no heartbeat monitoring device and there is no GSM module for sending voice alert message.

2.2 Dhiraj Sunehra, Sai Sreshta, V. Shashank, V. Uday Kumar Goud "Raspberry pi based smart wearable device for women safety using GPS and GSM technology".

In this paper a smart security solution called smart wearable device system is implemented using raspberry pi3 for enhancing the safety and security system. It provides a buzzer alert to the people who are nearby to the user. The system uses global positioning system to locate the user and send the location through SMS**.** The main advantage is This device gives real time location and a picture of the location. And disadvantage is that There is no audio recorder in this device, and it is not portable because they haven't designed it to carry.

2.3 Bysani Sai Yaswanth, Darshan R. S., Pavan H., Srinavasa D. B., B. T. Venkatesh Murthy "Smart safety and security solution for women using KNN algorithm and IoT".

This paper focuses on an IoT based self-security system that is comfortable, easy to use and wearable and helps to share user location when they feel panic and helps to find the nearest safe place. The system is controlled through raspberry pi and has two different modes namely normal mode and security mode. The advantages are the system cannot be identified by the culprit so that the chances

of destroying the system are less. Captured image is served as a proof in court and identify the culprit as soon as possible. The main disadvantage is that it only gives access to specific persons.

2.4 Muhib Ashraf Nibir, Protlasha Ghosh, Md. Emran Hasan "Smart security device for women based on IoT using Raspberry pi".

This paper is focused on a new IoT based evidence collecting device to ensure women's safety and security. This system consists of a raspberry pi, buzzer and camera, flux sensor, GSM, and GPS modules in a combined way. Advantages are Women can use this compact device with their undergarments easily and comfortably. Direct evidence collecting and saving them on web storage.and Also can be used by aged citizens and children's safety purposes. Disadvantages are Due to its large size; scaling of this device's size should be done and High cost of implementation of this device.

2.5 V.Hyndavi, N. Sai Nikhita, S. Rakesh "Smart wearable device for women safety using IoT".

In this paper, a smart device for women's safety which automates the emergency alert system by using pressure sensors, pulse rate sensors and temperature sensors to detect a possible atrocity automatically using outlier detection. It sends an emergency message with location automatically to the relatives and nearby police station.the advantages are that system is adaptable, Light weight, cost-efficient and easy to carry and it doesn't require any internet connections. Disadvantages is that area has mobile signals for the sim card.

2.6 Gourishankar V., Prabhakaran G., Tamilselvan K.S. "IoT based smart id card for working women safety".

This paper suggests that IoT is used to implement a smart public safety and security solution for women. The authors create a wearable device for women that uses a microcontroller, GPS and GSM to send emergency notification to their guardians or appropriate authorities. This technology can be used to track women's movements and location. Advantages are to Track women's movements in real time, respond quickly to any potential problems and card hardware becomes more affordable in near future. Disadvantages are It will only work if it is installed and linked to an existing security system.

2.7 M. Ashok Kumar, P. Pratheepa, Essaki Muthu "IoT based women safety bag".

A smart security bag with GPS and WIFI connection using Arduino is introduced. This system consists of camera module, GSM module, buzzer, and push buttons. Arduino collects the location details of women with GPS module. advantages are it captures the image of the attacker, generating the alarm whenever the attacker attacks the women, and the system is adaptable. The main disadvantage is that there is no voice recording facility.

2.8 Priya.C, Brindha B, Swetha M "Raspberry Pi based women safety system".

A smart device for women's protection that automates the emergency alarm system by using pressure, pulse rate and temperature sensors to detect a potential atrocity automatically via outlier detection is proposed in this system.

2.9 Barukam Vamshi Krishna Yadav, A. Viji Amutha Mary, Mercy Paul Selvan, S. Jancy "Arduino based women safety tracking device".

This paper is about navigation-based women protection system. In dangerous situation where a woman is afraid or in danger, the system gives two alarms. A GPS and a GSM module is used in this project. By pressing start button the system sends SMS including sim and GPS information immediately to specific people or police station. Advantages are the device is feasible and low maintenance. The device is compact it can be carried in bags, this device can also be used for tracking children. disadvantages are Only live location is provided in the SMS. There is no visual or audio in the SMS to find what is happening there at a dangerous situation.

CHAPTER 3

EXISTING SYSTEM

3.1: BLOCK DIAGRAM

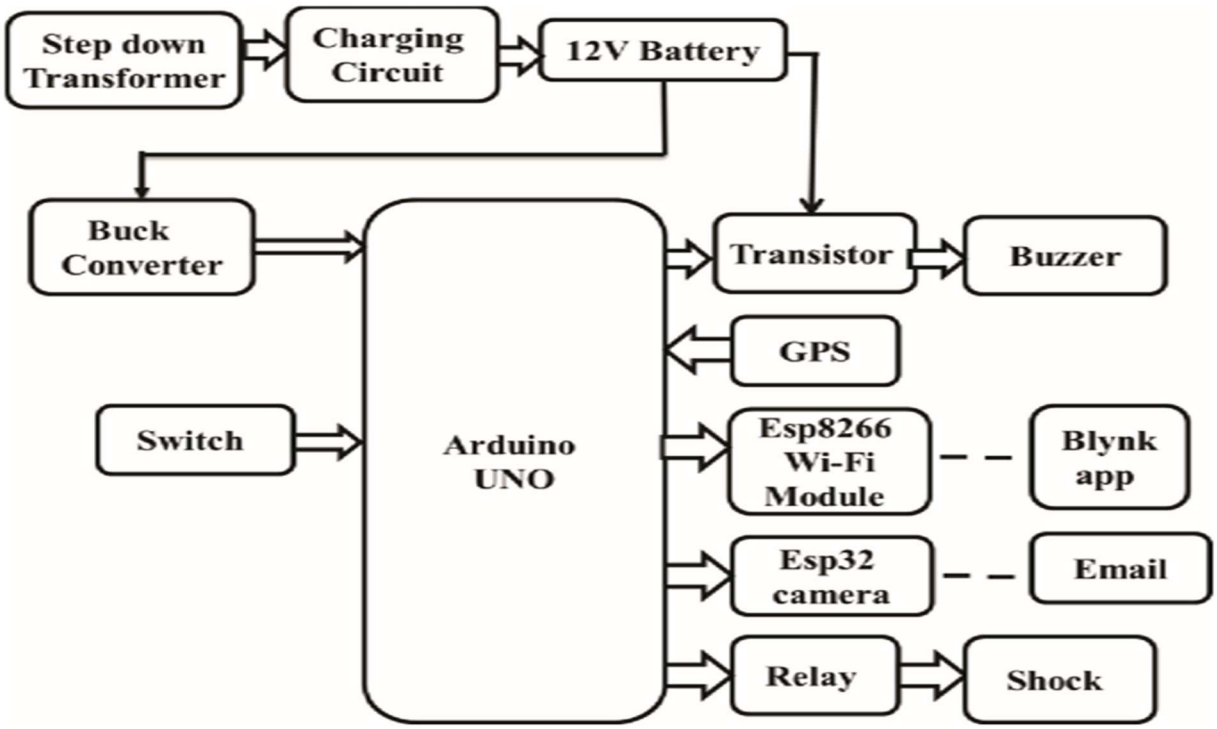

Figure 3.1: Block Diagram of Existing System

In this project, a wearable carry bag is proposed as an alternative method for women's security that might be a better option than the rest of the security measures already in place. Here, the system uses an IOT and GPS-based intelligence-based security system [3] to meet the needs and demands of victims of crimes against women. Since such an incident cannot be predicted, it is best to use an enabled Arduino UNO microcontroller. Women are more secure and safe thanks to this device. This paper proposed an IOT-based intelligence-based security system [3] to meet the needs and demands of victims of crimes against women. Since such an incident cannot be predicted, it is best to use practical tools designed to help people safely flee violent situations to reduce the likelihood

of harassment. This lowers the risk and provides help when it's needed. Features of the suggested work for the support of women's safety are as follows:

- Send messages from the device to registered mobile numbers and the nearest police station.
- Spot the current location of the victim using Google Maps.
- While attacking women, give the criminal a light electric shock.
- Captures images of the criminal or location and sends them to registered mail.
- Turns on the siren to warn anyone nearby.

CHAPTER 4

PROPOSED SYSTEM

4.1 BLOCK DIAGRAM

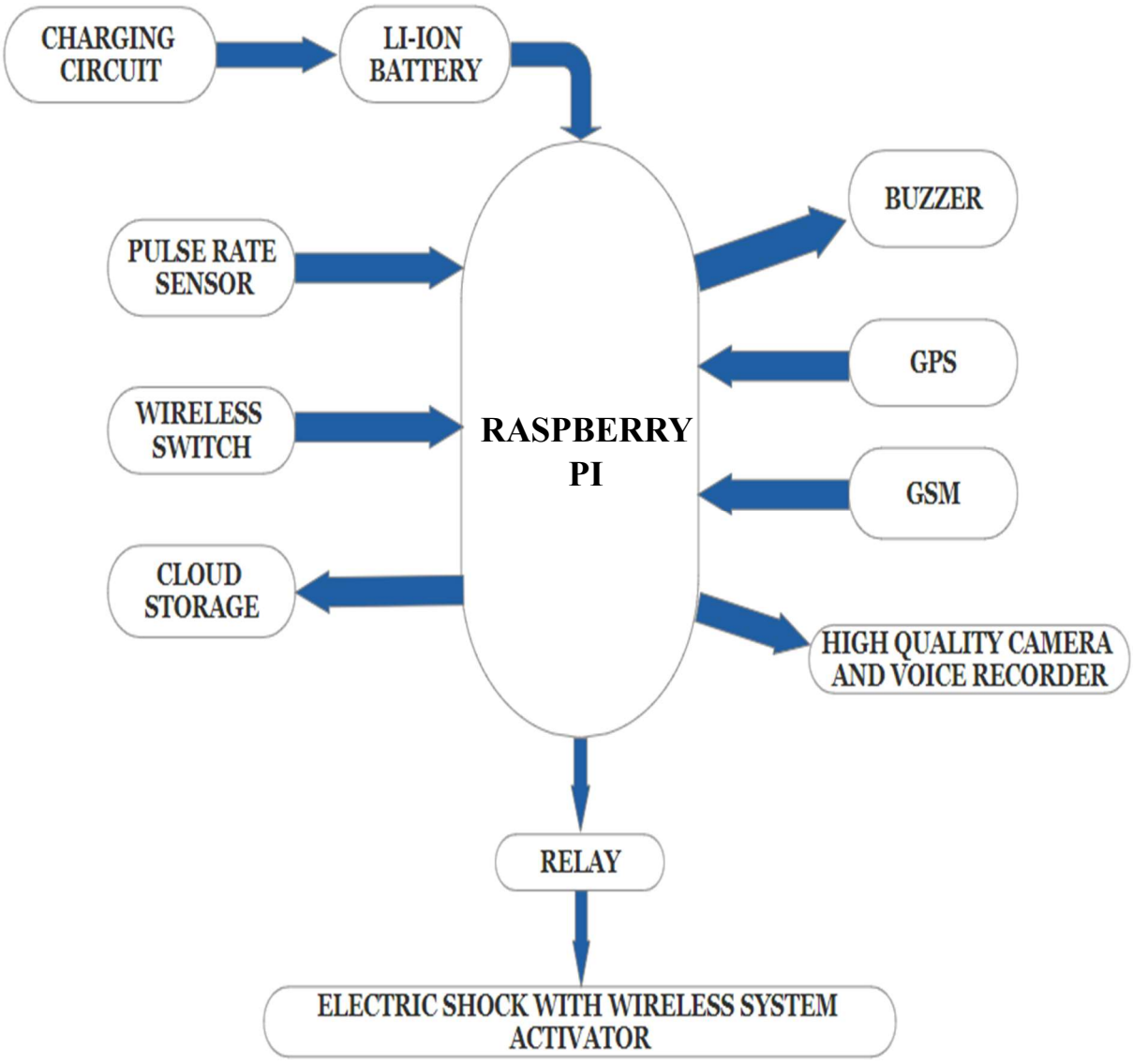

Figure 4.1: Block Diagram of Proposed System

Smart personal safety device using iot works by using some combination of components and technologies. The security system is controlled by a RASPBERRY Pi 4b model board and it is

programmed using c program. It has both GPS system and gsm system integrated together for compact size. The system is equipped with a high-definition raspberry pi camera and a microphone for recording evidence of the attacker and GPS system to track the live location of victim and all these details are send using GSM system to the nearby police station and to the relatives. The most important role of this project is that it protects women, children and old age people from attacker. There is 3 way to activate the security system. First method is by just pressing the wireless swich that is implemented using esp8622 like a keychain ,then the system activates automatically by sensing the pulse rate using pulse rate sensor and the last way is that it is equipped with electric shocker for protection from attacker while implementing a wireless switch in that electric shocker to activate .The system uses a li-ion battery of 7.4 V for power supply which is small compact and rechargeable. The system is connected to blynk application for the ease of use. The smart personal safety device using IoT is a most important tool that must be with everyone in this world.

4.2 CHARACTERISTICS

Video and audio capture system: The system is equipped with a video and audio capturing module that records the criminal or the location and send them to registered email addresses.

GPS tracking: The bag utilizes GPS technology to track the current location of the woman. This information can be accessed through the Blynk mobile application.

Siren: The system is equipped with a siren that can be activated to warn anyone nearby in case of an emergency.

Electric shock with wireless switch: The bag has a feature that can give the criminal a light electric shock when attacking a woman, providing a means of self-defense and to wireless switch to activate the system.

Messaging system: The bag can send video audio and live location to the registered mobile numbers and the nearest police station, alerting them about the situation.

4.3 WORKING

The system works on the basis of an IoT platform the main component of this project is raspberry pi 4 B. The raspberry pi is used as the control panel when an incident occurs the victim can both press the wireless switch implemented on the keychain or watch or otherwise the system automatically sense the pulse rate and activate the system .When the system is activated the ESP32 camera microphone starts recording and the file is being uploaded to cloud storage for future legal

evidence and for sending the video and audio recording with the victims live location to the nearby police station and to relatives there is a buzzer system that activates when the system is activated for alerting nearby peoples for help. Moreover, the system is equipped with an electric shocker.

4.4 EXPECTED OUTCOME

- Quick activation of system
- Undetectable camera module
- Quick response
- Quick action to threatens.
- Effective battery management
- Compact
- Effective personal security system

CHAPTER 5

CIRCUIT DIAGRAM

5.1 CIRCUIT DIAGRAM

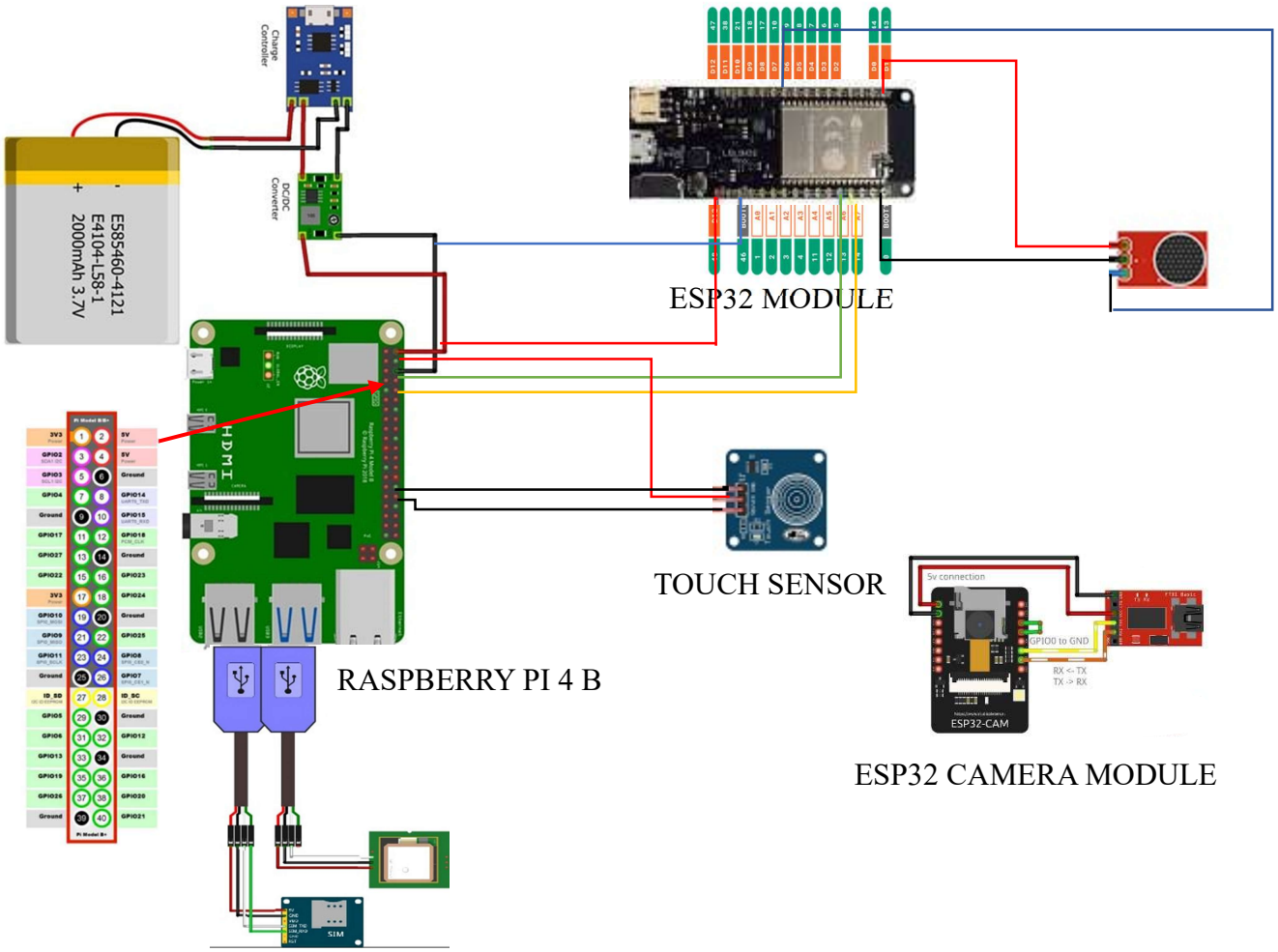

Figure 5.1: Circuit Diagram of Proposed System Diagram

5.2 COMPONENTS

RASPBERRY PI 4

Figure 5.2.1: Raspberry Pi 4 B

- Here we are using raspberry pi 4 for the implementation of smart personal safety device
- Raspberry Pi has everything a computer needs to function – just in a tiny package.
- The GPU and CPU are in a single, integrated circuit. Other components, including a USB port, RAM, and SD card slot are soldered on.

The SD card is typically used to hold the operating system, and potentially some more files.

GPS AND GSM MODULE

Figure 5.2.2: GPS and GSM

- Here we are using integrated module for GPS and GSM which is compact in size.
- GPRS and gsm are technologies that deal with mobile communications services.
- GPS is about satellite navigation services.
- GPRS and GSM can be accessed via gsm-compatible mobile phones.

RASPBERRY PI CAMERA

- The Camera Module 2 can be used to take high-definition video, as well as stills photographs.
- The camera works with all models of Raspberry Pi 1, 2, 3 and 4.
- It can be accessed through the MMAL and V4L APIs, and there are numerous third-party libraries built for it, including the Pi camera Python library.

ESP32 WIFI MODULE

Figure 5.2.3: ESP32 Module

- ESP32 is a series of low-cost, low-power system on a chip microcontroller with integrated Wi-Fi and dual-mode Bluetooth**.**
- The ESP32 is highly integrated thanks to its integrated antenna switches, RF baluns, power amplifiers, receive low noise amplifiers, filters, and power management modules.
- The ESP32 improves the functionality and adaptability of your application while reducing the need for a printed circuit board.

VOICE RECORDER

- A voice recorder is an electronic device or software application designed to capture and store audio recordings.

- These recordings can be made using built-in microphones or external ones, depending on the device's design.

TOUCH SENSOR

Figure 5.2.4: Touch Sensor

- A touch sensor is a type of device that captures and records physical touch or embrace on a device and/or object. It enables a device or object to detect touch or near proximity, typically by a human user or operator**.**

LI-ION BATTERY

Figure 5.2.5: Li-ion Battery

- A rechargeable battery known as a lithium-ion or Li-ion battery stores energy through the reversible reduction of lithium ions.
- It is the most common type of battery utilized in electric vehicles and portable consumer electronics.
- Li-ion batteries have high energy densities, low self-discharge, and no memory effect when compared to other technologies for rechargeable batteries.

PULSE RATE SENSOR

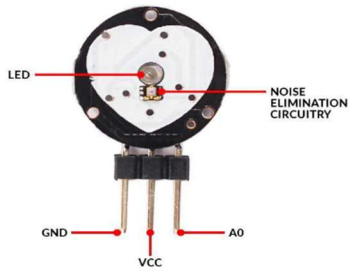

Figure 5.2.6: Pulse Rate Sensor

- A pulse rate sensor measures pulse and heart rate.
- Here we are using it as a system activator.

5.3 APPLICATIONS

- Advanced protection is provided for each and every one by tracking location and sending alert message with voice and video recording.
- Wireless system activator for ease of use.
- In military purpose.
- For children, women and old aged people.

CHAPTER 6

ADVANTAGES

- Compact
- Easy to use.
- Portable in bags laptop bags etc.
- Live tracking.
- Video and audio capturing.
- Storing and sending information captured to relatives and police station.
- Advanced technologies.
- Wireless switch and pulse rate sensor for system activator.
- Electric shocker for protection from threatens.

CHAPTER 7

DISADVANTAGES

- There is no temperature sensor.
- There is no motion detected system activator.

CHAPTER 8

CONCLUSION

The suggested system aids in lowering the number of crimes committed against women. This project's main objective is to make sure that every woman in our society feels comfortable and safe. According to a poll 53% of working women in India report feeling unsafe. It enables women to travel freely and independently.

The project has been successfully implemented to provide the solution for modern self-defence for women’s safety. In addition, this system is very promising for real-time applications due to its quick processing time and can be utilized for the safety of all women through continuous monitoring. They will examine the application of women's safety in the future to determine whether technology in the safety field can be used to capture live conditions with greater accuracy. They have more opportunities to develop or transform this project in numerous.

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