

SMART SELF-DEFENCE GADGET FOR WOMEN'S SAFETY USING IOT

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Abstract

Thousands of people (mainly women) are daily mistreated, battered and abused by their ex-couples or their current couples. In this sense, electronic surveillance can be an efficient tool for helping to guarantee the safety of victims. Ambient Intelligence (AmI), based on ubiquitous computing, represents a promising approach to make technology adapt to people in order to solve the challenge of developing strategies that allow the early detection and prevention of problems in safety environments and more specifically, the protection of people under risk situations, including cases of mistreatment or loss. This paper describes Guardian, an integral solution designed for improving the protection of mistreated and at-risk people by means of the integration of GPS, GPRS and ZigBee technologies. The basic architecture of the system, the proposed wireless devices as well as the communication protocol used between the system and the devices are described. Furthermore, a first hardware and software prototype is depicted and tested.

Keywords: Ambient Intelligence, GPS, GPRS, Zigbee technologies, electronic surveillance.

INTRODUCTION

In the current global scenario, women are facing a lot of challenges. We can hear the news of women harassment more than their achievements. There are many existing applications and devices for women's security via smart phones. Though the smart phone technology has increased rapidly, it is not possible to have the phone all the time in our hand to make a call or click on it, so here we introduced a new technique via smart jacket which has an alarm feature, shock generator, camera to capture the attacker's image and GPS/GSM to detect victim's location and nearby police station; make a ring there so it will be helpful for police to arrive soon at the spot by tracking the GPS, such a system will lead to safer and better environment.

1.1 Main System Description

The system comprises sections that describe a quick responding, cost protection system for an individual and especially for women using which a woman in distress can call for help with the press of a button on this smart gadget. Self Defense System for women safety is a Smart Jacket for Women. It has the ability to help women with technologies that are embedded in a compact device. The women wearing this device as a jacket, in case of any harassment or when she finds that someone is going to harass, she presses a switch that is located on the jacket or when the user has fallen the information about the attack along with the body posture and location, information is sent as SMS alert to a few predefined emergency numbers and soon help is on its way. The system will consist of embedded hardware and software co-designed for this dedicated application. The system allows for knowing the exact location of the individual, as soon as the trigger key on the watch is pressed.

1.1 How the System Works

The aim of the proposed algorithm is to help women by the technologies that are embedded in it. Smart Jacket for Women is specially designed for women's safety. When the victim feels danger, he/she presses the emergency key or just calls out the passcode; the kit displays an emergency situation. If the voice command matches with the one stored in the database then the appropriate action takes place. For example, if DANGER is the set passcode and the device gets the voice command given by the victim, then a text message is sent to a number of the police stations and also an alarm is activated. Another emergency key is also provided in the kit and if it is pressed by the victim it generates an electric shock of around 40-50 V DC which can give a severe shock to the person who is trying to mistreat.

1.3 Existing System Drawbacks

- The current system does not provide that strong self-defense mechanism.
- The current system does not directly send the victim's location to the nearest police station and relatives. It does it through a pre-installed application on the victim's smart phone.
- The current system is not that effective as it does not have facilities like a shock generator that could help the victim during the emergency.
- The current system does not come with an inbuilt camera which can help in further legal proceedings against the attacker.

1.4 Scope of the Project

Although the system is complete and works efficiently, new modules that enhance the system functionality can be added without making any major changes to the entire system as the technology changes or new requirements from the user to enhance the functionality.

1.5 Purpose

Self-defense and alert system for individuals to avoid crimes alone or being in dangerous areas:

- Implementation of a real-time monitoring device can solve the problem to an extent.
- The basic approach is to intimate instant location and a distress message to the cops and registered number like parents, friends, media, and women cell, etc. so that unfortunate incident would be averted and to provide real-time evidence for swift action against the attacker. Shock mechanism to produce non-lethal electric shock.

1.6 Problem Statement

In the latest horrific incident in Jammu and Kashmir, we have shocked the nation and warned about women's safety and security. In regards to issues, people have different means of protection. Finally, tools should be introduced to ensure women's protection with different technologies.

This project describes about a smart intelligent security system for women. Women all over the world are facing much unethical physical harassment. This acquires a fast pace due to lack of a suitable surveillance system. Our project is a venture to resolve this problem. We are using jacket that can be used in day to day life. The system resembles a jacket incorporated with pressure switch as an input which when activates shows the result Screaming alarm and tear gas mechanism are imposed for self-defense purpose and send location and messages to the emergency contacts. We really believe that this endeavor will make a difference in the women life

DESIGN AND IMPLEMENTATION

3.1 Introduction

Analysis is the process of breaking a complex topic or substance into smaller parts to gain a better understanding of it. Analysis in the field of engineering look at requirements, structures, mechanisms and systems dimensions. Analysis is an exploratory activity.

The Analysis Phase is where the project lifecycle begins. The Analysis Phase is where you break down the deliverables in the high-level Project Charter into the more detailed business requirements. The Analysis Phase is also the part of the project where you identify the overall direction that the project will take through the creation of the project strategy documents.

Gathering requirements is the main attraction of the Analysis Phase. The process of gathering requirements is usually more than simply asking the users what they need and writing their answers down. Depending on the complexity of the application, the process for gathering requirements has clearly defined process of its own. This process consists of a group of repeatable processes that utilize certain techniques to capture, document, communicate and manage requirements.

3.2 Detailed design

Once the requirements document for the software to be developed is available, the software design phase begins. While the requirement specification activity deals entirely with the problem domain, design is the first phase of transforming the problem into a solution. In the design phase, the customer and business requirements and technical considerations all come together to formulate a product or a system.

This chapter discusses the design elements that are required to develop a software design model. It also discusses the design patterns and various software design notations used to represent a software design.

3.3 System Architecture

A system architecture is a conceptual model that defines the structure, behavior and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system.

- The user on asserting any one of the pre-loaded voice commands can start operating the device.
- On acknowledgement of the voice command of the user the device turns on.
- On pressing a button, a message regarding the threat can be sent to the nearest police station and the family members whose contacts have been preloaded.
- The police station receives the message and user location tracking is been provided by GSM and GPS respectively..
- Even System takes photo of the person and send e-mail to nearest police station.
- Along with the message, the user can also capture and send the image of the assailant to the police station with the help of miniature camera in the device.

Table 1: Specs of the Raspberry Pi 3 B and Raspberry Pi 3 B+

Spec	Raspberry Pi 3 B	Raspberry Pi 3 B+
CPU Type/Speed	ARM Cortex-A53 1.2GHz	ARM Cortex-A53 1.4GHz
RAM Size	1GB SRAM	1GB SRAM
Integrated Wi-Fi	2.4GHz	2.4GHz and 5GHz
Ethernet Speed	10/100Mbps	300Mbps
PoE	No	Yes
Bluetooth	4.1	4.2

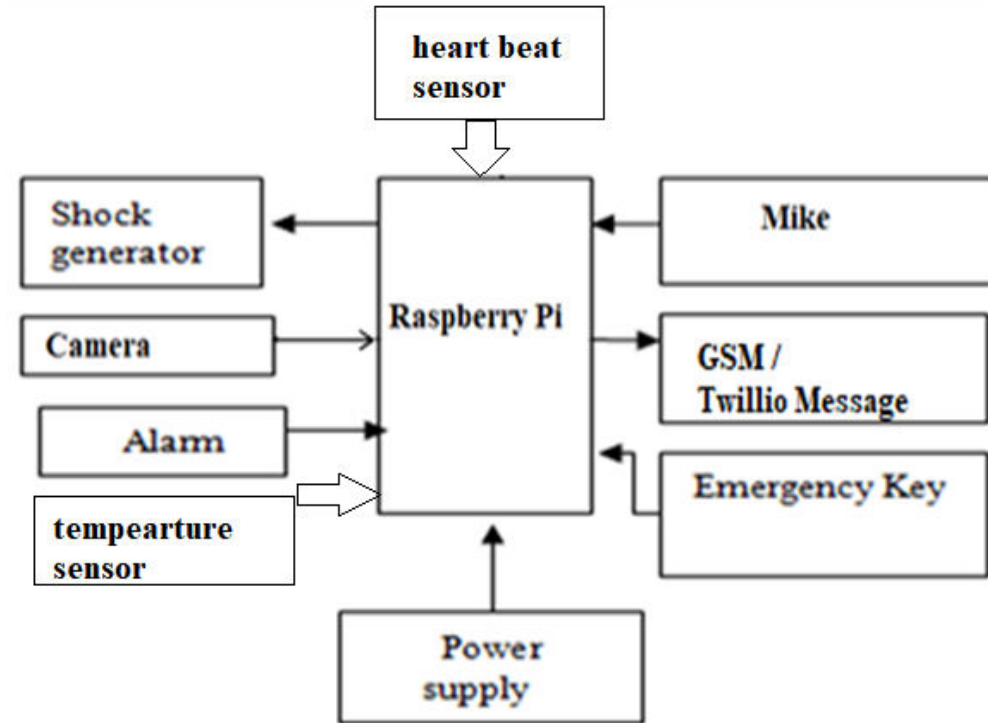


Figure 1: Block Diagra

3.4 Flowchart

A flowchart is a type of diagram that represents an algorithm, workflow or process. Flowchart can also be defined as a diagrammatic representation of an algorithm (step by step approach to solve a task).

The voice command kit takes voice command as the input from the user and matches it with the set passcode. If the passcode matches with the command, the alarm system and the shock generator gets activated. If the further emergency key is pressed, then the inbuilt camera gets switched on and starts capturing the surrounding images and the location of the user/victim to the nearest police station and the emergency contacts saved in the GSM Module.

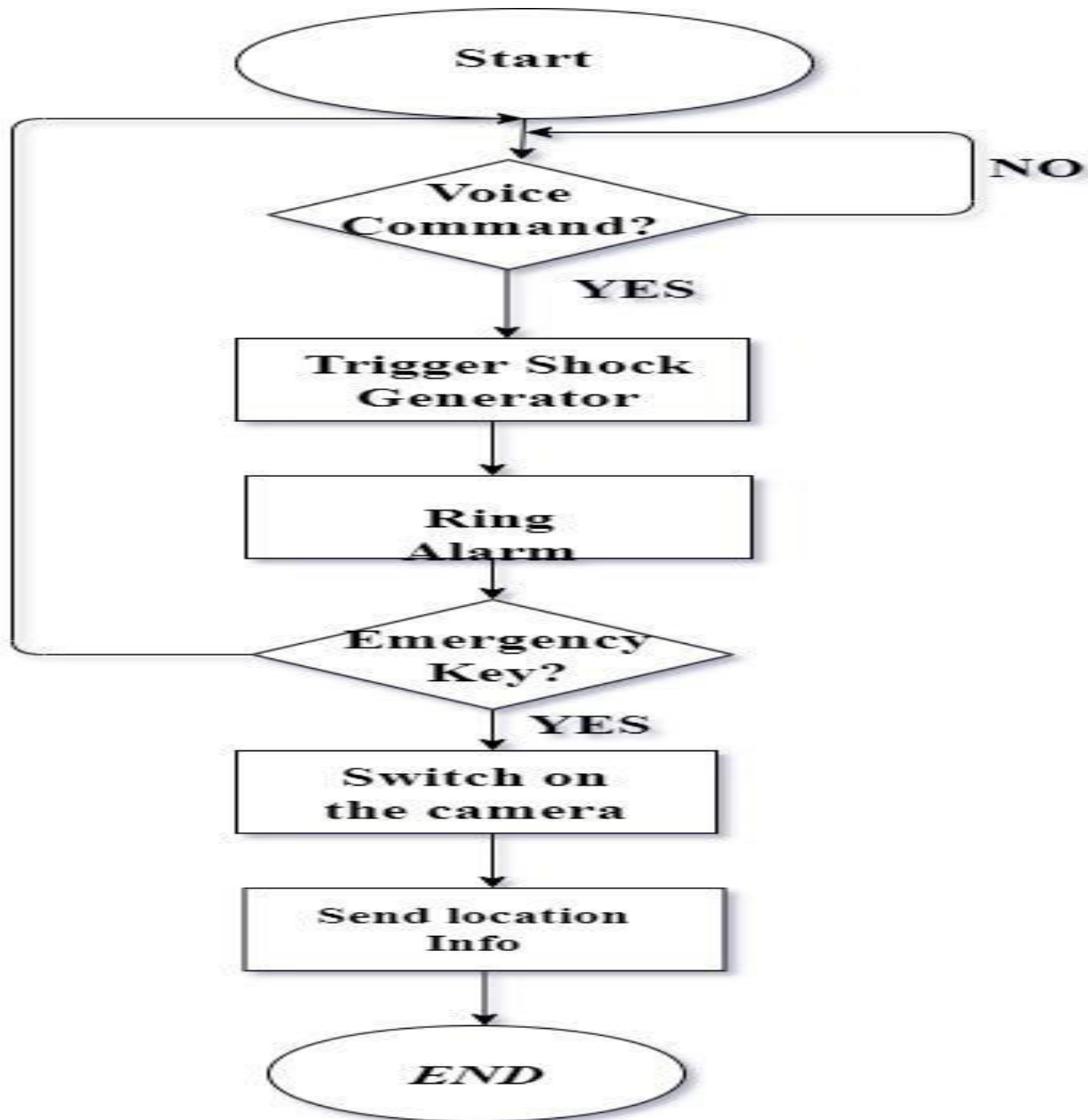


Figure 2: Flowchart

3.5 Implementation

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- Along with the message, the user can also capture and send the image of the assailant to the police station with the help of miniature camera in the device.
- In this Project, intimation will be sent to concerned person through GSM module when emergency situation is detected.

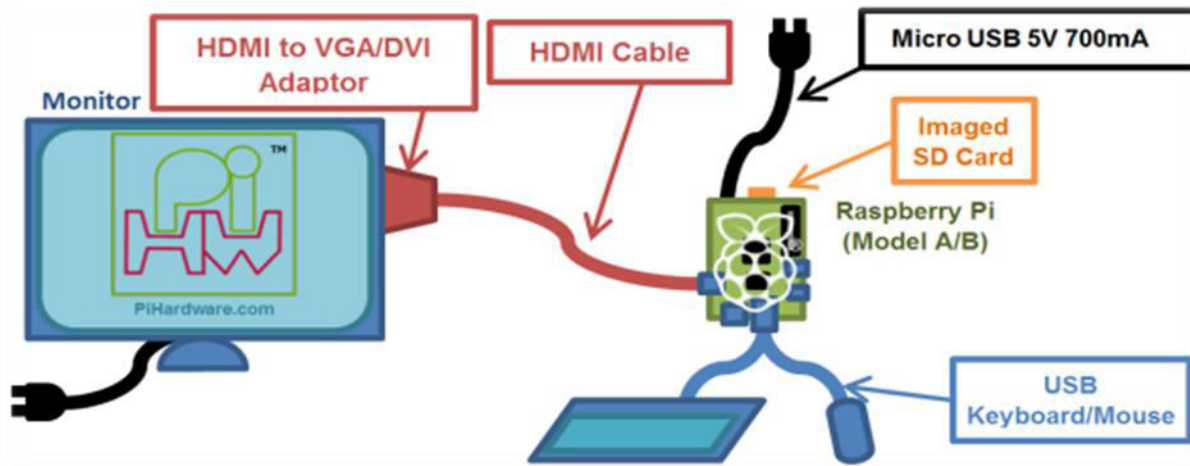


Figure 3: Working of the System

OBJECTIVES AND METHODOLOGY OF THE PROPOSED SYSTEM

4.1 Proposed system

The main objective of the Self Defense Jacket For Women Safety is that it helps women to defend themselves in situations of danger. The jacket helps the victim to contact their relatives, friends and the nearest police station. Meanwhile, the jacket can help to track the location of the victim through GPS and for self-defense it can produce shock waves that can render the attacker immobile for a certain time duration, helping the victim to escape or hide from the attacker. In addition to this, it also can alert nearby people through an alarm. This makes self-defending easier than the existing system. Our proposed system also provides the facility of an inbuilt camera to capture the image of the attacker that can help in taking legal actions against the attacker. It also helps in the monitoring of health of the particular women. If any abnormal conditions found the system will automatically intimate the concerned person

4.2 Objectives of the proposed system

The main purpose of the system is to efficiently help women defend themselves in situations where they feel unsafe. It is a cost-effective and popular means of defense system. The jacket gets activated when the set passcode is spoken. This triggers the alarm system and the shock generator. If the victim still feels unsafe, he/she can press the emergency key which will switch on the inbuilt camera and send the location of the victim to their relatives, friends and the nearest police station who can track the location through GPS. So it reduces the crime happening in the country.

4.3 Advantages of the proposed system

- The proposed system helps women defend themselves in situations of danger.
- The system is provided with four modules in a single jacket i.e alarm system, GPS for location tracking, shock generator and an inbuilt camera.
- The system can also be used for the safety of children and elderly people.
- The system helps reduce crime rates against women.
- The image captured by the system can be used as legal evidence of a crime with exact location information for prosecution.
- The system will also help in finding the attacker with the help of the image captured through the camera.

4.4 Methodology of the Proposed System

- Voice command i.e. when the set passcode is spoken, will initiate actions such as alarm
- system (to intimate the situation to the public and to confuse the attacker).
- Switching on the shock generator (it will be the shock of low voltage i.e. 50-60 volts).
- Pressing the emergency key will further send the location of the victim to the family
- members and the nearest police station through the GSM module.
- The victim's location can be tracked through GPS.
- The camera is activated to capture the attacker's image.

RESULT

- The user on asserting any one of the pre-loaded voice commands can start operating the device.
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- On pressing a button, a message regarding the threat can be sent to the nearest police station and the family members whose contacts have been preloaded.
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- Even System takes photo of the person and send e mail to nearest police station.
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- Intimation to the care taker and nearest police station.
- Emergency alert to concerned person.
- Health monitoring.
- Location tracking.
- Face recognition.

CONCLUSION AND FUTURE ENHANCEMENTS

Conclusion

The project grants designing about the women facing a lot of critical situation at present days and will assist to clarify them scientifically with compressed kit and concept. Making use of smart jacket, the system sends the messages with the location. From the above mentioned product, it can run over the suffering of every woman in the world about her assurance and security.

Future Scope

As the main aim in the world is to ensure women's security, by this model we can also achieve our aim slowly. It would reach the rural areas and the women can benefit themselves at a low price and women can leave their houses without any worries. This system can be more advanced by adding calling feature also. The location can also be sent to the nearest police station. Images can be clicked in the advanced system.

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