SMART WEARABLES FOR WOMEN SAFETY

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Abstract

Every day, every woman, young girls, mothers and women from all walks of life are struggling to be safe and protect themselves from the roving gaze of the horribly insensitive men who molest, assault and violate the dignity of women on a daily basis. The streets, public transport, public places in particular have become the dominion of the hunters. Due to these atrocities that women are subjected to in the present scenario, a smart security wearable device for women based on Internet of Things is proposed. It is implemented and comprises of Raspberry Pi, Raspberry Pi camera, buzzer and button to activate the services. This device is extremely portable and can be activated by the victim on being assaulted just by the click of a button that will fetch her current location and also capture the image of the attacker via Raspberry Pi camera. The location and the link of the image captured will be sent to predefined emergency contact numbers or police via smart phone of the victim thus preventing the use of additional hardware devices/modules and making the device compact.

Keywords: Raspberry pi processor, USB Camera, GPS Receiver, GSM, RF module, Relay

1. Introduction

The Government of India, meeting a longstanding demand for gender parity in the workforce, has approved an amendment in The Factories Act 1948 to allow women employees to work in nightshifts. The amendment suggests that nightshift for women shall be allowed only if the employer ensures safety, adequate safeguards in the factory as regards occupational safety and health, equal opportunity for women workers, adequate protection of their dignity, honour and transportation from the factory premises to the nearest point of their residence are met. Nightshifts have been in existence for a long time, however for India it was only recently through an amendment to the Factories Act 1948 that it was allowed under the law for women to work nightshifts.

WHY SOCIETY NEED WOMEN SAFETY

• About 10% of all the crimes committed in the country are those of women abuse.

• Women make up two-thirds of the estimated 876 million adults worldwide who cannot read or write
• 30 lakh girl children were lost to female infanticide during 2001-2011.

• A woman is raped every 20 minutes in India.

• After 60 years of independence, 1 in 3 women in India are still illiterate.

• Only 39.5% women in India are economically active, compared to 80% in China.

• Of the 1.3 billion people who live in absolute poverty around the globe, 70 percent are women. • 10.9% of the female population owns land, and among agricultural workers the figure drops down to 9.3%.

• Less than 40% of women give birth in a health facility.

2. LITERATURE SURVEY

[1] In the present scenario, women are keeping pace with men in every walk of life but unfortunately at cost of being subjected to abuse, harassment, and violence in public and even at their own houses. They cannot step out of their houses at any time of the day. This system is implemented by Raspberry Pi zero. The Raspberry Pi Zero is slower than the Raspberry Pi 3.

[2] Nowadays, women and children safety are a prime issue of our society. The count of the victims is increasing day by day. Project proposes a model which will help to ensure the safety of women and children's all over the global. We have used different sensors like heartbeat sensor, temperature sensor, accelerometer sensor for detecting heartbeat, temperature and sudden change in motion of user. We have also used GPS which will help to detect location of the device. GSM used in the model is used to send alert message to guardians, relatives and police station. We have proposed IoT (internet of things) based device which will help to continuously monitor values of different sensors and GPS used in device.
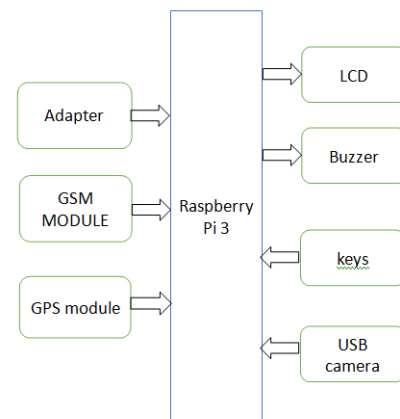
[3] ''Smart girls security system''. In this paper they gives information about various modules like GSM shild(A900),Arduino Board, GPS tracking, Screaming alarm and pressure Sensor

[4]"Android Application for women security system" .In this paper they are developed one android application which is useful as women security purpose. Generally this service can be start by clicking the ACTIVATION SERVICE BUTTON. By pressing VOLUME KEY emergency message will be send to the registered contacts.

[5] "Design And Development of Women Self Defence Smart Watch Prototype" [9].This paper proposes idea of interaction between user and technology. They are developed one Smart Watch which communicate with GPS system. Also they are develop one system which contain electric shock generator module, screaming alarm module, voice recognition module which is useful for women security

3. Implementation:

Block Diagram

The aim of this paper is to develop a device which can protect women in such situations where communication via mobile also becomes challenging. Raspberry Pi3 is used for interfacing Raspberry Pi camera and buzzer, a buzzer module emits a high frequency alarm to draw the attention of the public towards the victim, a camera module that captures the image of the criminal when the victim is being assaulted thus helping in criminal apprehension on pressing of a button, a Message Sending module that is used to send the current location of the victim tracked via GPS of the user's smart phone and the link of the image captured via Raspberry Pi camera to the emergency contact numbers using SMS.

4. Related Work:

The brief introduction of different modules used in this project is discussed below:

POWER SUPPLY:

Using Samsung 2 Amp adapter for power supply of Raspberry pi3.

Raspberry Pi 3 Model B:

The Raspberry Pi 3 Model B is the latest single-board computer from the Raspberry Pi Foundation. In this version, they've upgraded to a 1.2 GHz 64-bit quad-core ARM processor and added 802.11n Wireless LAN, Bluetooth 4.1 and Bluetooth Low Energy.

The Raspberry Pi 3 is a credit-card sized computer capable of doing just about anything a desktop PC does. From web surfing and word processing, to playing Mine craft or acting as a media player, the Raspberry Pi's capabilities are extensive. With plenty of graphics processing power, the Raspberry Pi 3 is capable of streaming BluRay-quality video. If you're looking to incorporate the Pi into your next embedded design, the 0.1" spaced 40-pin GPIO header gives you access to 27 GPIO, UART, I2C, SPI as well as both 3.3V and 5V power sources.

Raspberry Pi processor is programmed using embedded 'Linux'. Linux is the best-known and most-used open source operating system. As an operating system, Linux is software that sits underneath all of the other software on a computer, receiving requests from those programs and relaying these requests to the computer's hardware.
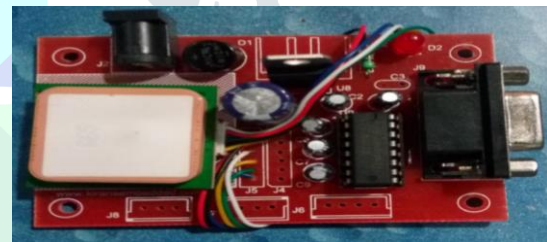
GSM MODULE:

GSM is a cellular network, which means that cell phones connect to it by searching for cells in the immediate vicinity. This is a GSM/GPRS-compatible Quad-band cell phone, which works on a frequency of 900/1800 and which can be used not only to access the Internet, but also for oral communication (provided that it is connected to a microphone and a small loud speaker) and for SMS.

GPS:

A GPS receiver calculates its position by precisely timing the signals sent by the GPS satellites high above the Earth. The receiver utilizes the messages it receives to determine the transit time of each message and computes the distances to each satellite. These distances along with the satellites' locations are used with the possible aid of trilateration to compute the position of the receiver. This position is then displayed, perhaps with a moving map display or latitude and longitude; elevation information may be included. Many GPS units also show derived information such as direction and speed, calculated from position changes.

The GPS Receiver consists of two units, first is active antenna which receives RF signals and amplifies it. The antenna is active in the sense it takes power from the module and amplifies the signal for high sensitivity. The RF signal is filtered and processed to generate NMEA format serial data output.

Switches or Pushbutton:

The simplest solution is to connect simple RC circuit which will suppress each quick voltage change. Since the bouncing time is not defined, the values of elements are not strictly determined .When the user pressing a button, a Message Sending module that is used to send the current

location of the victim tracked via GPS of the user's smart phone and the link of the image captured via Raspberry Pi camera to the emergency contact numbers using SMS.

USB Camera:

In our undertaking camera is utilizing to consistently gushing the video of found place. The details are demonstrated as follows.

Particulars:

- Built-in mic with commotion decrease
- Interpolated to 25 Mega Pixels
- 10 Level Zoom on live Motion Picture
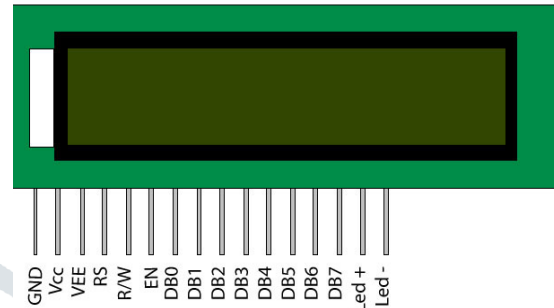- Special Visual Effects
- True Motion Picture

Buzzer- Indication:

The **piezo buzzer** produces sound based on reverse of the piezoelectric effect. The buzzer produces a same noisy sound irrespective of the voltage variation applied to it. It consists of piezo crystals between two conductors. When a potential is applied across these crystals, they push on one conductor and pull on the other. This, push and pull action, results in a sound wave. Most buzzers produce sound in the range of 2 to 4 kHz. The Red lead is connected to the Input and the Black lead is connected to Ground.

LIQUID CRYSTAL DISPLAY:

A model described here is for its low price and great possibilities most frequently used in practice. It is based on the HD44780 microcontroller (*Hitachi*) and can display messages in two lines with 16 characters each. It displays all the alphabets, Greek letters, punctuation marks, mathematical symbols etc. In addition, it is possible to display symbols that user makes up on its own.

4. RESULTS:

The IOT based Women safety system is successfully designed. In case of emergency user need to press button, then a message is sent to concerned care takers/parents and/or police using GSM.

5. CONCLUSION:

The project mainly focuses on the low cost implementation of the device which can save the life of the women in the critical condition the proposed system provides end to end security solutions for women safety using the advance technologies of IoT along with combined hardware technology like Raspberry pi.

The proposed system not only defends the women in the critical situation of rape, molestation but also the captured image of the culprit is used as a valid proof that can be presented in the Indian Judicial Courts for making the culprit guilty for his committed crime. The overall system is first of its kind that provides a complete kit solution to the existing women safety problem, with the complete system the women can now travel freely without any hesitations of getting harmed by the societal issues. The further research can be made to make the prototype version of our system into a consumer portable product.

6. ACKNOWLEDGEMENT

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