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# IOT based Women Safety Jacket Using Arduino

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**ABSTRACT:** India is a growing nation, however there is still a lot of crime committed against women. Women are especially vulnerable when they travel alone in isolated areas or on lonely highways, because there aren't enough safety measures in place to protect women. Hence, they carry a lot of electronic devices to protect themselves. The suggested safety device, WSM, can help to protect women from criminal activity by sending immediate message and live streaming to the preferred numbers. Less power and energy are used by the suggested Arduino board. The suggested model is an all-in-one security precaution system that can be activated with a single click. It tracks movements using GPS and GSM technology, enabling and sending of an emergency message and live streaming to the Arduino's pre-programmed contact list.

**KEYWORDS:** Women safety, Arduino board, GPS, GSM, Live streaming.

## I. INTRODUCTION

In the current global environment, women's top concerns are safety and the startlingly high rate of harassment. Their incessant concern is when they will be able to leave the house fearlessly, even at odd hours. It is crucial to have a customized security gadget made with women's safety in mind to handle this urgent issue. This gadget is made to provide unmatched functionality with a straightforward design. Its primary purpose is to quickly notify police authorities and pre-designated contacts of the user's exact location and distress signal. This not only prevents terrible events but also provides real-time proof for prompt justice against those who commit crimes against women. The two main parts of the system's architecture are a specific gadget or circuit and a mobile application designed to protect women. Research says 60% of visits to doctors are for simple small-scale diseases, 80% of which can be cured at home using simple home remedies. Typical cold and cough, headache, stomach problems, and so on are among these diseases. These are treatable without the help of a physician and they are being brought on by weather variations, eating an unhealthy diet, exhaustion, etc.

This is an intelligent security system for women. The lack of an appropriate surveillance system causes this to happen quickly. Our endeavor aims to find a solution to this issue. The primary component of the system is a monitoring device, from which insecure situations are identified by processing the output. When a woman presses first button, it will send a message to the contacts, if she presses second button then it will send live streaming. The interconnectivity of physical objects, cars (sometimes called "smart devices" and "connected devices"), buildings, and other objects embedded with electronics, software, and network connectivity that allow these objects to gather and share data. The majority of sensors were used to track blood pressure, heart rate, and body temperature. Wearable sensor gadgets like the heart rate sensor, spo2 sensor, Temperature sensor and body area network sensors were popular types which may employed monitoring vital indicators for epidemic trends.

The addition of sensors and actuators to Internet of Things technology makes it a member of the broader class of cyber-physical systems, which also includes intelligent transportation in smart cities, smart grids, virtual power plants, smart houses, and smart homes. This essay focuses on a security system created specifically to give women security so they won't ever feel defenseless in the face of such societal difficulties. Screaming alarm (APR 9600), GPS (GY-GPS6MV2), Arduino ATmega328 board, GSM shield (SIM 900A), a set of pressure sensors for activation, and a power supply unit are some of the modules that make up the system. The main inspiration for this approach came from the Delhi Nirbhaya case, which shocked the entire country.

## II. LITERATURE REVIEW

In [3] Sensible phones are effectively employed for many forms of alternative protection or personal safety, especially for girls. Presenting this project is Safe Women: AN application for girls' safety, a personal safety app designed for

high-quality phones running the Automaton platform. Police are able to obtain the victim's message and video by using the pressure device, camera, and automaton application. Message also forwarded to the victim's contacts on their portable device. Within the message type, this application notifies the registered contacts of the user's location.

In [4] the pulse-rate and pressure sensors are the most often utilized sensors in these devices, which are used to record the condition of women experiencing safety concerns. Additionally, the devices used a variety of technologies, such as the Raspberry Pi, the Global Positioning System (GPS), and the Global System for Mobile Communication (GSM), to convey the notifications. Additionally, a number of machine learning algorithms including logistic regression and decision trees are employed to recognize potentially vulnerable women and assist in averting unfavorable circumstances for them in advance. Additionally, the shortcomings and difficulties associated with IoT devices and their applicability to women's safety have been brought to light. Furthermore, this paper suggests an architectural model that outlines key elements required to create Internet of Things-based women's safety devices. Finally, this study highlights the utilization of sensor combinations to obtain a variety of input data types that may improve the accuracy and precision of identifying potential threats

In [5] the study focuses on a security system that is made specifically to give women security so they never feel vulnerable in the face of such social issues. The system is made up of a number of components, including the power supply unit, GPS (GY-GPS6MV2), Arduino ATmega328 board, GSM shield (SIM 900A), screaming alarm (APR 9600), and a set of pressure sensors for activation. The main inspiration for this approach came from the Delhi Nirbhaya case, which shocked the entire country. It was past time for us ladies to make a shift.

In [7] project goal is to give every lady safety by utilizing cutting-edge technology. The primary goal of this project is to ensure women's protection so they never feel defenseless. The major components of this project are a camera, high voltage DC shock circuit, Arduino, Raspberry Pi, and 4G LTE + GPS module. Women nowadays face a multitude of challenges, and it is imperative that everyone consider the protection of women. The primary goal of this project is to create a safety jacket for ladies. Since the complete apparatus is integrated into the jacket, any lady can wear it anywhere.

### III. EXISTING SYSTEM

Innovative Wearable Safety Gadgets for Women:

**SAFELET:** A wearable safety gadget for women, the Safe let has two side buttons that can be used to contact the guardian member or send a message. For audio recording to begin, it also synchronizes with the user's smartphone. When a member receives an alert about a potentially dangerous scenario, they can instantly call 911 from within the app.

**FEMME:** This apparatus makes use of an ARM controller. It uses Bluetooth to synchronize the device and smartphone, which are both trigger-able separately. It features a hidden camera detector and records audio as well. It is an easy-to-use system.

**SURAKSHA:** It is a device that is activated by three means that are, voice, switch, and shock. The unique functionality of this device is it's automatically locked when not in use so that unnecessary signals are not sent. The device with Voice commands or forceful throws can be used to start the device, which uses force sensors to track location and deliver messages to registered phone numbers. When in trouble, the gadget can also be turned on with a small push of a switch.

### IV. METHODOLOGY

The suggested solution calls for creating a little gadget that looks like a typical jacket. It has two push buttons, an Arduino Nano, a camera, and GSM/GPS modules. Two separate systems that are each controlled by two switches are included in the prototype. When the first switch is touched, the gadget will have activated and sends victim's location immediately using GPS, with an emergency message will be sent to contacts that have been stored with the most recent location along with latitude and longitude values. The system will turn on the camera when the second switch is pressed. The victim's most recent location will be sent to the recipient in the form of coordinates, which can be utilized with Google Maps to pinpoint the precise location The photographs will be captured and recorded by the camera.

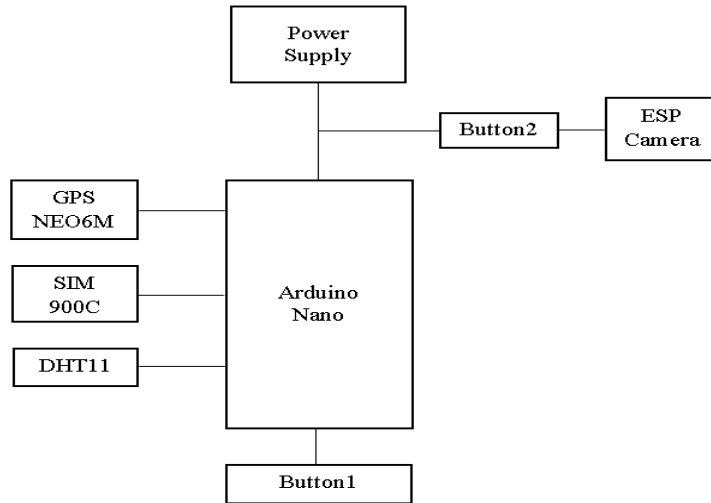


Fig 4.1. System Architecture

**ARDUINO NANO:** A microcontroller board with many functions packed into a small form factor, the Arduino Nano is both powerful and compact. Programming is made easier by its USB interface, which lets users upload code straight from their PCs. The Arduino Nano is programmed using the Arduino Software (IDE), Arduino's Integrated Development Environment common to all our boards and running both online and offline.

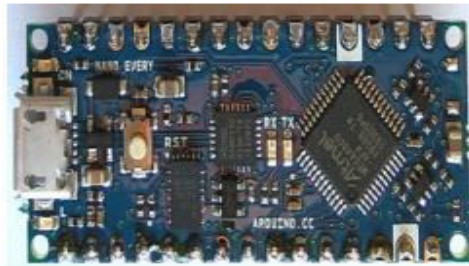


Fig 4.2. Arduino Nano

**ESP32 CAMERA:**

With a 40 x 27 mm footprint and a deep sleep current of up to 6 mA, the ESP32 CAM Wi-Fi Module Bluetooth with OV2640 Camera Module 2MP for Face Recognition boasts a very competitive small-size camera module that can operate independently as a minimum system. It is also widely used in various Internet of Things applications. It is appropriate for Internet of Things applications such as wireless monitoring, industrial wireless control, and smart home devices. Using a DIP package, this module may be installed straight into the backplane to enable quick product production. It offers consumers a very reliable connection mechanism, making it ideal for use in a range of IoT hardware terminals.



Fig 4.3. ESP32 Camera

**GPS:** The United States government owns and operates the Global Positioning System (GPS), formerly known as NAVSTAR GPS, a satellite-based radio navigation system. This global navigation satellite system (GNSS) provides location and time information to GPS receivers anywhere on or near Earth, requiring at least four or more GPS satellites can be seen clearly. Buildings and mountains obstruct the comparatively feeble GPS signals.



Fig 4.4. GPS

**GSM:** This SIM900A GSM modem is a plug-and-play, quad band GSM modem with great flexibility that may be easily integrated with RS232 applications. Voice, SMS, Data/Fax, GPRS, and an integrated TCP/IP stack are among the features it supports. A SIM card given by a network operator is needed for the shield to be linked to a cellular network. The user will receive information about the quantity that is being detected in the RFID card using this GSM. Additionally, a network will be used to enable the ability to recharge the card and know the available balance.



Fig 4.5. GSM

**DHT11–Temperature and Humidity Sensor:** The DHT11 temperature and humidity sensor is a widely used device that measures temperature using a separate NTC and outputs the results as serial data using an 8-bit microprocessor. The sensor has an accuracy of  $\pm 1^{\circ}\text{C}$  and  $\pm 1\%$  for temperature measurements between  $0^{\circ}\text{C}$  and  $50^{\circ}\text{C}$  and humidity measurements between 20% and 90%. This sensor might therefore be the best option for you if you're trying to measure in this range.

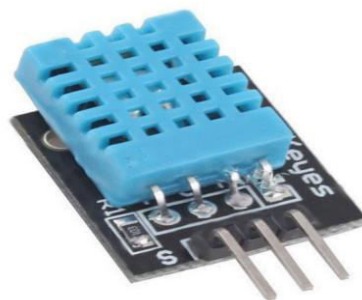


Fig 4.6. DHT11–Temperature and Humidity Sensor

V. FLOW CHART

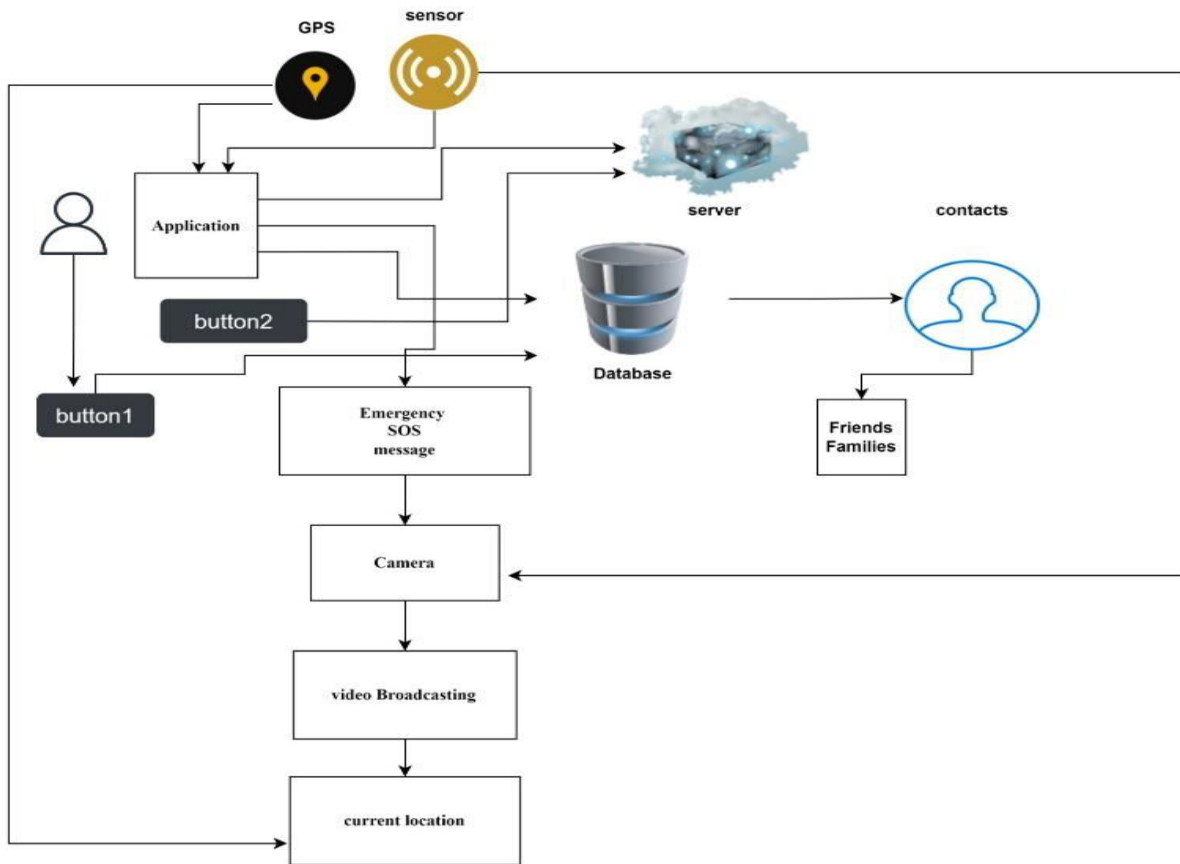


Fig 5.1. Flowchart of working system

VI. FUTURE SCOPE

The design of this kind of jacket is really helpful, but it needs to be very small. This can be achieved by using additional VLSI size reduction techniques, allowing any woman on the planet to use the device in her everyday routine. In situations when parents and teachers prioritize the safety of their children, smart protective jackets can also be employed as child safety devices. Additionally, these jackets are used to ensure the safety of the elderly.

VII. CONCLUSION

Women Security Jacket is developed via the integration of many system modules. To send an emergency message to contacts that have been stored, this system uses a GPS module and GSM module to relay the current longitude and latitude values. The system may be triggered by just pressing a switch in the event that it detects violence. Protecting women from hazardous circumstances like abduction and harassment is the project's main goal.

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