

## **WOMEN SAFETY NIGHT PATROLLING ROBOT USING ESP32 CAMERA AND GPS SYSTEM**

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### **ABSTRACT**

Ladies security has emerged as one of the most important needs in our nation, taking into account what is happening in the metro metropolitan neighborhoods and other big urban locations. In light of the present situation of the metro cities and other big cities, women security has emerged as one of the most important requirements in our country. In this world of advanced technology and smart electronics it is required to have a simple and cost-effective safety gadget that helps the victims during unforeseen dangers. This paper covers descriptive details about the design and implementation of prototype for an electronic gadget which has the potential to serve as a safety wear in the coming years. The device consists of a switch, Arduino Uno Board, GSM module (SIM900), GPS module (Neo-6M), buzzer, and pulse sensor (SEN-11574). The main working of this project is that anytime a woman senses danger, all she has to do, is to hold on the button of the device. Once the device is activated, it tracks the place of the women using GPS (Global Positioning System) and sends emergency messages using GSM (Global System for Mobile communication), to already registered mobile number and the police control room. The pulse sensor checks the pulse of victim and in abnormal health situation the device also sends current GPS location to ambulance at every 10 sec

in form of SMSs .The main advantage of this system is that this device small and easy to carry. The use of sophisticated components ensures accuracy and makes it reliable.

### **OBJECTIVE OF THE PROJECT**

Women safety is one of the major issues in today's world. The world is becoming so much unsafe for women. In today's world, most of the women are stepping out at any time from their house for working. Even though many technologies have been introduced for women still kidnapping, eve teasing and sexual harassment are taking place in our country. In last few years crime against women has increased to a greater extent. Women are harassed not only in the evening or night but also during day hours at home, working place, shopping etc. There is number of women's who have been afraid of strangers for their safety. Around 80% of the women in our country have fear regarding their safety. In past decades women's usually won't step out from their house for work, so there was more safety. But in the recent situation, women's want to be employed and want to work outside, but there is the lack of safety; various systems have been built to provide safety for women. Each system use a different kind of techniques to detect the unsafe situation of women. Some of them used panic sensors to detect the condition of the women by

heartbeat change in women's body. Within this application we're maintaining a switch.

Within the worst situation whenever we press switch in those days with location place will be delivered to the Control station that is signed up for the memory IC is deserving of a note like help needed. Gps navigation gives just the longitude and latitude values but by utilizing Maps within the mobile you can obtain the location name where the content continues to be sent.

The controller takes the switch since its input i.e. when some threat has happened one have to press that switch and also the controller helps make the DC motor on for Protection By comparison, an over-all purpose computer, like a pc (PC), is made to be flexible and also to meet an array of finish-user needs. Embedded systems control many devices in keeping use today. Embedded systems are controlled by a number of primary processing cores which are typically either microcontrollers or digital signal processors (DSP). The important thing characteristic, however, has been focused on handle a specific task, which might require very effective processors. For instance, air traffic control systems may usefully be observed as embedded, while they involve mainframe computers and dedicated regional and national systems between airports and radar sites.

### **LITERATURE SURVEY**

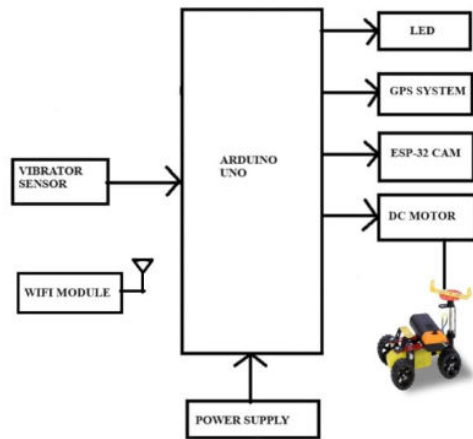
The status of women in India has gone through many great changes over the past few millennia. From equal status with men in ancient times through the low points of the medieval period to the promotion of equal rights by many reformers, the history of women in India has been eventful. In modern India, women have adorned high offices in India including that of the President, Prime Minister, Leader of the

Opposition and Speaker of the Lok Sabha. However, women in India continue to face social challenges and are often victims of abuse and violent crimes and, according to a global poll conducted by Thomson Reuters, India is the fourth most dangerous country in the world for women, and the worst country for women among the G20 countries. Women's security is a critical issue in today's world and its very much needed for every individual to be acting over such an issue. Many unfortunate incidents have been taking place in woman's case. Problems may come from any direction such as women walking on the road after the work, going to super market or many other reasons for which they go alone. People at home are not sure of their return safely. Another factor is woman die without knowing the reason as they attend excursions and industrial trips conducted by the organizations. It happens due to attacks on woman but not suicides. In 2013 there happened an incident which is a gag rape in New Delhi in the case of 23 years old woman in bus at 9:30 PM. Another incident that has taken place at Mumbai in the case of woman who is leaving her native place after Christmas holidays has been kidnapped and killed. These are some of the problems that have taken place in the day to day life of women. The IT companies are looking forward to the security problem and require a system that will efficiently evaluate the problem of women employees security working in night shifts. In recent years, acts of assault and violence against women are rising at a menacing rate. With escalation of female employees in industries and other sectors of the commercial market, it is now becoming a necessity for females to travel at late hours and visit distant and isolated locations as a part of their work regime. However, the exponential increase in assault, violence and attacks against women in the past few years, is posing a

threat to the growth and development of women.

**HARDWARE DESCRIPTION**

**BLOCK DIAGRAM**



**Fig 1. Block Diagram Of Women Safety Night Patrolling Robot**

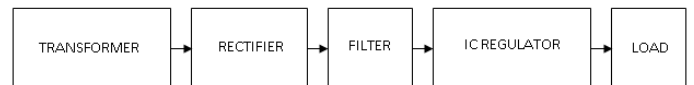
The block diagram explains about the input and output connections to the microcontroller and the left side is all the inputs to the microcontroller and right side is all the output from the microcontroller.

**POWER SUPPLY**

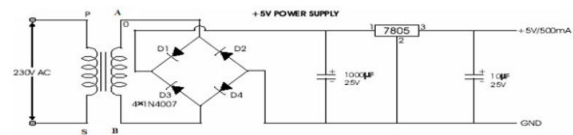
The power supply section is the section which provide +5V for the components to work. IC LM7805 is used for providing a constant power of +5V.

The ac voltage, typically 220V, is connected to a transformer, which steps down that ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation.

A regulator circuit removes the ripples and also retains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes. This voltage regulation is usually obtained using one of the popular voltage regulator IC units.

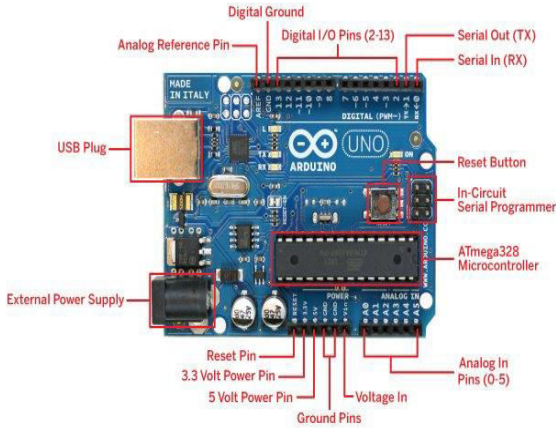


**Fig 2: Block Diagram of Power Supply**



**Fig 3: Circuit Diagram of Power Supply**

**Arduino uno ATMEGA328 Microcontroller**



Arduino/Genuino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

"Uno" means one in Italian and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now evolved to newer releases. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform; for an extensive list of current, past or outdated boards see the Arduino index of boards.

## UART (Universal Asynchronous Receiver/Transmitter)

### FEATURES:

16 byte Receive and Transmit FIFOs

Register locations conform to 550 industry standard. Receiver FIFO trigger points at 1, 4, 8, and 14 bytes. Built-in fractional baud rate generator with auto bauding capabilities. Mechanism that enables software and hardware flow control implementation.

### ATMEGA 328P FEATURES

Microcontroller	ATmega328P
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limit)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
PWM Digital I/O Pins	6
Analog Input Pins	6
DC Current per I/O Pin	20 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328P) of which 0.5 KB used by bootloader
SRAM	2 KB (ATmega328P)

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EEPROM	1 KB (ATmega328P)
Clock Speed	16 MHz
Length	68.6 mm
Width	53.4 mm
Weight	25 g

Fig 2. Motor

### L293D DRIVER CIRCUIT

L293D IC generally comes as a standard 16-pin DIP (dual-in line package). This motor driver IC can simultaneously control two small motors in either direction; forward and reverse with just 4 microcontroller pins (if you do not use enable pins).

### DC MOTOR

A DC Motor in simple words is a device that converts direct current (electrical energy) into mechanical energy. It's of vital importance for the industry today.

### Gear DC Motor

Geared DC motors can be defined as an extension of DC motor. A geared DC Motor has a gear assembly attached to the motor. The speed of motor is counted in terms of rotations of the shaft per minute and is termed as RPM. The gear assembly helps in increasing the torque and reducing the speed. Using the correct combination of gears in a gear motor, its speed can be reduced to any desirable figure. This concept where gears reduce the speed of the vehicle but increase its torque is known as gear reduction. This Insight will explore all the minor and major details that make the gear head and hence the working of geared DC motor.

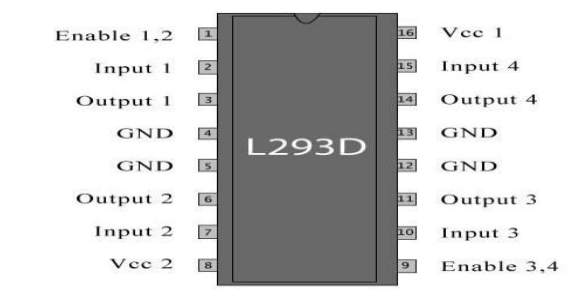


Fig 3 L293D pinout

### ESP-32 CAM MODULE

ESP32-CAM is a development board module with a size of 27×40mm. It can be integrated into a camera system with an ESP32 module and camera. ESP32-CAM can be widely used in various IoT applications. It is suitable for home smart devices, industrial wireless control, wireless monitoring, QR wireless identification, wireless positioning system signals and other IoT applications. It is an ideal solution for IoT applications. ESP32 is the name of the chip hat was developed by Espressif Systems. This provides Wi-Fi (and in some models) dual-mod Bluetooth connectivity to embedded devices. While ESP32 is technically just the chip, modules and development boards that contain this chip are often also referred to as —ESP32 by the manufacturer.

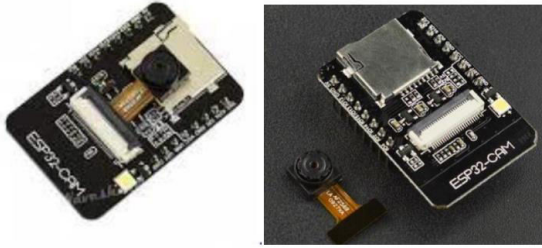


Fig 4 ESP32 CAMERA

### LCD 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 symbol that user makes up on its own. Automatic shifting message on display (shift left and right), appearance of the pointer, backlight etc. are considered as useful characteristics



Fig 4.LCD

### IR SENSOR

Infrared is a energy radiation with a frequency below our eyes sensitivity, so we cannot see it Even that we can not "see" sound frequencies, we know that it exist, we can listen them. Eventhat we can not see or

hear infrared, we can feel it at our skin temperature sensors. When you approach your hand to fire or warm element, you will "feel" the heat, but you can't see it. You can see the fire because it emits other types of radiation, visible to your eyes, but it also emits lots of infrared that you can only feel in your skin. Infra-Red is interesting, because it is easily generated and doesn't suffer electromagnetic interference, so it is nicely used to communication and control, but it is not perfect, some other light emissions could contains infrared as well, and that can interfere in this communication. The sun is an example, since it emits a wide spectrum or radiation.

### BUZZER

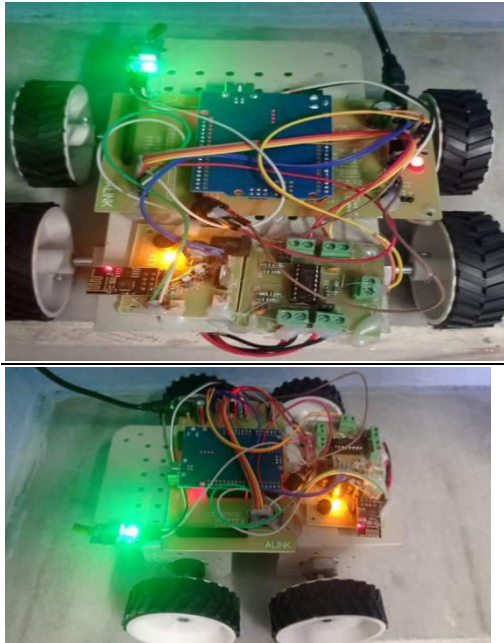
Digital systems and microcontroller pins lack sufficient current to drive the circuits like relays, buzzer circuits etc. While these circuits require around 10milli amps to be operated, the microcontroller's pin can provide a maximum of 1-2milli amps current. For this reason, a driver such as a power transistor is placed in between the microcontroller and the buzzer circuit.

### RESULT

The proposed design will deal with critical issues faced by women during night and provide security with advanced technology. While the society may or may not change its mind set but this device will help to feel women independent. The main working of this project is that anytime a woman senses danger, all she has to do, is to hold on the button of the device. Once the device is activated, DC motor will start and Cutter of dc motor will on then it will effect on other person. When the IR sensor activated means person detected for that purpose we are using cutter for protection and also buzzer also ON for the alert.

**Table 6.1 Response**

IR Sensor reading	Accepted
Webcam Video display	Accepted
Move Forward	Accepted
Move Reverse	Accepted
Turn Left	Accepted
Turn Right	Accepted
Stop	Accepted

**Fig 5. System Output**

## **ADVANTAGES AND APPLICATIONS**

### **ADVANTAGES**

1. It is an all-in-one system. Hence no need to carry multiple devices.
2. GPS tracking feature tracks the user lively when you are the move after triggering the emergency button.
3. The second distinct feature is, it also detects the hidden cameras which help in our privacy.
4. This device works without internet connectivity.
5. Consistence of Performances.

6. 24/7 Continuous working.

### **APPLICATIONS**

1. Technical Expertise.
2. Limited Autonomy.
3. Privacy Concerns

## **CONCLUSION & FUTURE SCOPE**

### **CONCLUSION**

Women security system ROBOT which is very useful application mainly for girl's safety. When we feel that we are in emergency situation, for example travelling alone in the Auto/Cab at night time we can use this application. so that on one click we can start the cutter This system can overcome the fear that scares every woman in the country about her safety and security. The application that send online to particular emergency control station. The proposed design will deal with critical issues faced by women during night and provide security with advanced technology. While the society may or may not change its mind set but this device will help to feel women independent.

### **FUTURE SCOPE**

he IoT-based smart night patrolling robot is a significant advancement in the field of surveillance and security. The integration of various components such as the Arduino Uno microcontroller board, camera module, sound sensor, ultrasonic sensor, motor driver, motors, Nodemcu, and buzzer have enabled the development of a system that can patrol a designated area autonomously and provide realtime feedback to the user. The web-based interface enables the user to monitor and control the system remotely, enhancing the system's accessibility. The proposed system has the potential to be expanded and customized to suit various applications, making it a versatile solution

for surveillance and security. The system has the potential to reduce the reliance on manual labour in night patrolling operations, reducing the risk of human error and improving the efficiency and effectiveness of the process. Overall, the proposed system is a significant advancement in the field of night patrolling operations, offering

enhanced security and surveillance, cost-effectiveness, and efficiency. The system has the potential to improve the safety and security of various applications such as industrial sites, residential areas, and public spaces. The proposed system is a valuable contribution to the field of IoT-based robotics, offering a reliable and cost-effective solution for surveillance and security.

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