RESEARCH ARTICLE

WOMEN SAFETY AND SELF-DEFENSE SYSTEM

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ARTICLE INFO	ABSTRACT
	Women's safety has becoming a major concern in present scenario. In this paper, a women safety and self-defense system is proposed which helps the women who is in danger. Whenever women feels harassed, sexually abused or in any kind of danger situation, she can press the emergency button which activates the entire system GPS will track the location in the form of latitude and longitude, an SMS will be sent with alert messageand IP address of video recording to the saved mobile numbers (friends, family and cop). A buzzer is placed which alerts the neighboring people.

INTRODUCTION

In India which is famous for its culture, traditions and values, women's safety is one of the most common problem as the crimes against women are increasing every day. Women are working equally with men in almost every field and achieving success in life. Violence against women is not a small issue that occurs in some areas of society, it is a global problem which needs urgent attention. It is time to take action: a life free of violenceis a basic human right, that every woman, man and child deserves. Our system provides safety and can defend herself with the help of push buttonto the women who are in critical situation. The proposed system intimate family, friends and police with SMS and call along with video recording such women can be saved within no time such that we can reduce the crimes.

RELATED REVIEW WORKS

This paper [1] proposes an IoT (Internet of thing) based women safety device which connects devices to the internet using sensors and a suitable platform. This IOT sensor is placed on the health monitoring equipment's to monitor the patient's health condition. This monitors the status of the patient and sent to the doctor if they are in need of treatment. By this way, it is useful for the doctors and it avoids the risk in the patient's life.

This paper [2] proposes a system which is designed with a small handy equipment which could be kept in the purse, when they are in the critical situation the button available in this device can be pressed and their location can be tracked by the police control room and their family members through the website. This paper [3] proposes a system to monitor patient, ECG wave anywhere in the world using IOIO-OTG Microcontroller. For monitoring ECG, an Android application has been developed for the quick access. IOIO-OTG microcontroller is connected to android phone using USB cable. Using that android application, the collected data or ECG wave can be monitored and stored.

COMPONENTS

ARDUINO UNO

It is open-source microcontroller board and based on the ATmega328P microcontroller and it was developed by Arduino.cc. It has set of analog and digital input-output pins used to interface with other boards. It has 14 digital I/O pins, 6 analog I/O pins and is programmable with the Arduino IDE(Integrated Development Environment). It accepts voltages between 7 to 20 volts. It also has a 16MHZ quartz oscillator and an USB association. It helps to program the microcontroller associated with the PC with USB link. "Uno" signifies the Italian word known as stamp the forthcoming arrival of Arduino 1.0. Here Uno and 1.0 will be the reference forms of Arduino.
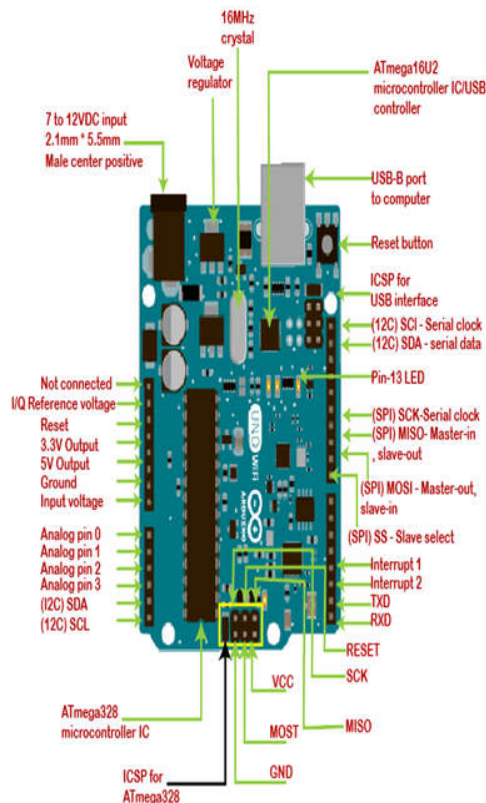
Fig.1. Arduino Uno board

Fig. 2. GPS module

SIM 28ML GPS Modem: The GPS receiver modem used here is SIM28ML GPS.It is a stand-alone or built in LNA.It will fulfill the antenna requirement and don't need any external LNA. It can even track low signal as -165 dBi without network interference. Applied voltage is 3.3V.Using adaptor we will supply the power to the GPS receiver. Each GPS satellite transmits at 2 frequencies,they are 1575.42MHZ and 1227.60MHZ. It is produced based on L-band frequency 10.23MHZ. The frequencies are generated by multiplying the fundamental frequency by 154 and 120 respectively.

GSM modem: It is specialized type of modem which can accepts the SIM card and operates as a subscription to a mobile operator just as a mobile phone. When GSM modem is connected to a computer, it allows the computer to use it as s mobile network. They are mostly used to provide the mobile network connectivity, many of them used to send SMS, voice calls and MMS messages.

Here we used SIM 900A GSM modem. It operates at 900MHZ frequency and supply voltage is 5V. It acts as transceiver(both transmitter and receiver).
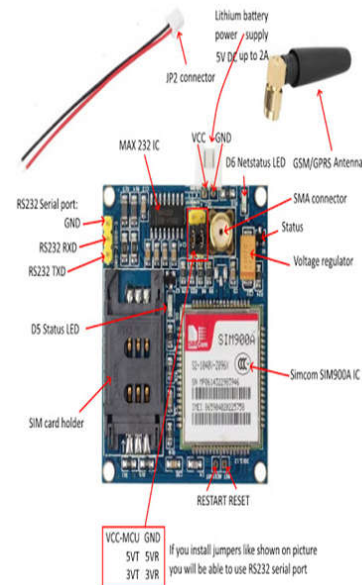

Fig.3. SIM900A modem

PUSH BUTTON

It is an electrical switch, tiny, sealed mechanism that completes an electrical circuit once you prolong it. once it is on metal spring makes contact with 2 wires, permitting electricity to flow. Once it is off, it's spring retracts and contact will be interrupted, current will not flow.

BUZZER

It is a sound flagging gadget which might be an electrical or piezoelectrical. Used to alert the surrounding people. Mainly used in alarm devices, timers and confirmation of user input such as keystroke or mouse click.

LED: Light Emitting Diode(LED) is a semiconductor device. It discharges the light when the electric flow is gone through it. Light is generated when the particles that convey the current consolidate together inside the semiconductor material.

ESP32 CAM: It is a lowcost development board with the WiFi camera. It uses for creating IP camera projects for video streaming with different resolutions. It was built in PCB antenna. It has WiFi and BLE(Bluetooth Low Energy) connectivity. OV2640 2M pixel cameras is included with connector. It has microSD card connector. To get it to initial condition a reset button is present. It is mostly used as it is inexpensive and easy to use, and it used perfectly in IOT devices requires a cameracontains advanced functions like image tracking and recognition.
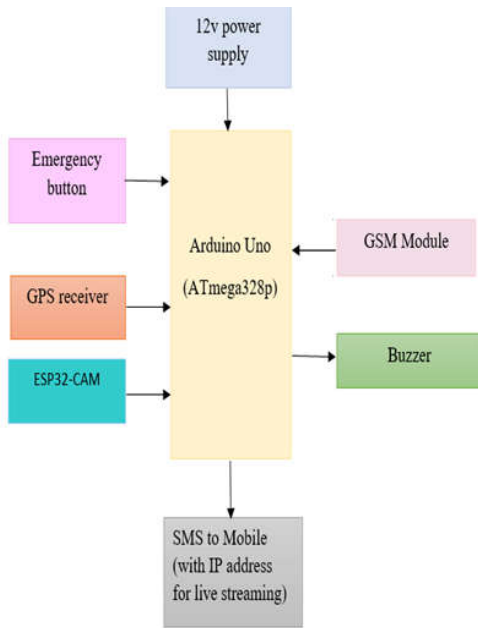

Fig.4. ESP32Cam

Fig.5. Block diagram of the system

BLOCK DIAGRAM

Fig.5: Block diagram of the system

SYSTEM OPERATION

When women is in danger or even if she feels unsafe she can press the push button and the entire system gets activated. It has the following features:

- A buzzer makes loud noise such that neighbouring people can alert and help the women.
- GPS is placed used to find the current location of the women.
- An SMS with message alert and location is sent to the preferred mobile numbers which are saved in GSM.
- Along with SMS, calling optionis also provided for the saved numbers.
- ESP32-Cam is used to provide the live recording and sent to the mobile numbers which will be helpful for finding the surrounding areas in which women is located and for proofs.
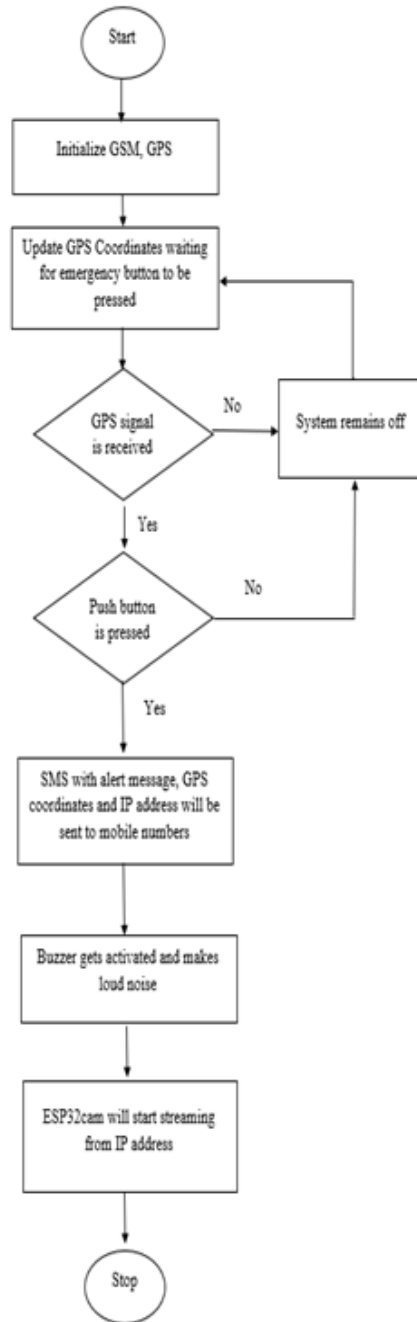

Fig.6. Realistic view of the project

FLOW DIAGRAM

Fig.7. Flow chart

Fig.8: Hardware setup of the system
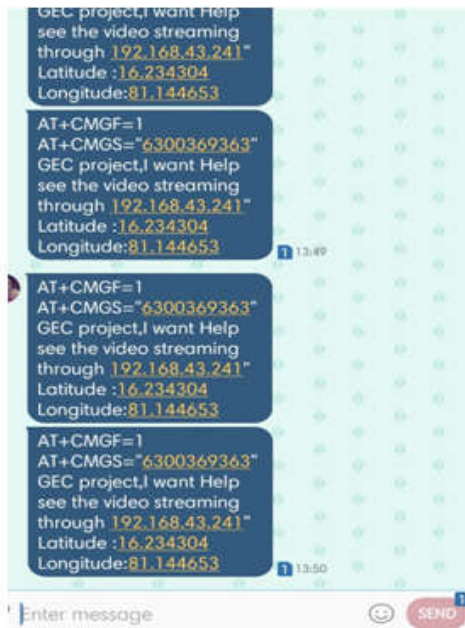
RESULTS

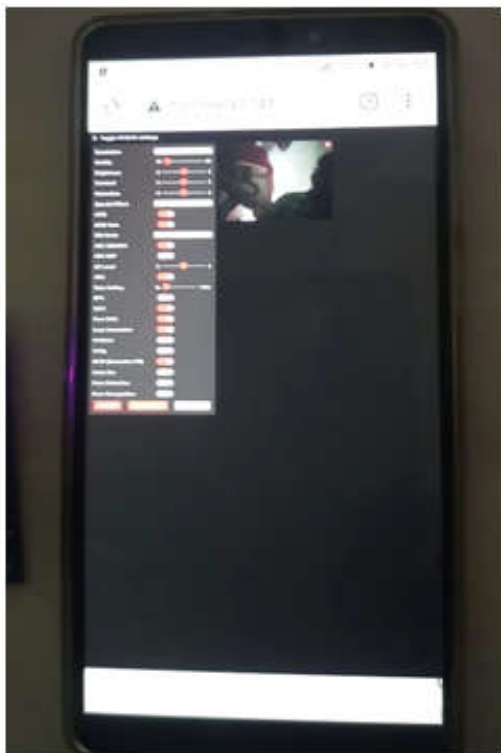**Fig.9: SMS with help message and location coordinates**

Fig.10. Live streaming output

CONCLUSION

Being safe and secure is the demand of the day. Our effort behind this project is to design and fabricate a gadget which is so compact in itself that provide advantage of personal security system. This design will deal with most of the critical issues faced by women and will help them to be secure.

Existing systems provide the mechanism to track the vehicle but no other emergency mechanism is proposed. The proposed mechanism provides viewing the location of the victim in terms of latitude and longitude which can further be tracked using Google maps. This system helps to decrease the crime rate against women. Women's security is a critical issue in current situation. These crimes can be brought to end with the help of real time implementation of our proposed system.

FUTURE SCOPE

Improvements of this system will reduce the size of the entire system. Such that.

- It can be used in pendants, blazers, ornaments.
- It is also compatible with mobile.

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