



PORTABLE SMART SECURITY DEVICE FOR WOMEN SAFETY

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Abstract: Now a day's women are less secure and have many issues regarding their security purpose. They have to undergo various difficult situations and have to prove themselves every time in all critical conditions. For women's security and safety purpose government has provided security through rules and regulation to the society. Although there are many existing systems for security purpose, there is a need of advanced smart security system is increased. In order to overcome such problems smart security device for women is implemented. This paper describes about safe and secured electronic system for women which comprises of an Arduino controller and various sensors like pulse rate sensor, sound sensor, GSM and GPS modules and mobile phone. When the women is in threat, the device senses the body parameters like heartbeat rate and the voice of the victim is sensed by sound sensor. When the sensor crosses the threshold limit the device gets activated and traces the location of the victim who is in danger using the GPS module. With the help of GSM module the victim's location is sent to the registered contact number.

Index Terms - Women safety, An Arduinocontrollers, mobile phone, GPS module, GSM module, sound recognition sensor.

I. INTRODUCTION

Embedded systems are part of larger systems and they perform some of the requirements of these systems. Some examples of such systems are auto mobile control systems, mobile phone, Industrial processes control systems or small sensor controllers. For monitoring and controlling complex processes, embedded real-time systems cover a large range of computer systems from ultra-small computer-based devices to large computer-based systems. The overwhelming number of computer systems belongs to embedded systems: Today 99% of all computing units belong to embedded-system. Most of such embedded systems are also characterized as real time systems, which mean that the real-time properties such as response time, worse case execution time, etc., are important design concerns. These systems usually meet stringent specifications for safety, reliability, availability and dependability. Due to their small size and requirements for mobility, extremely low production costs they require small and controlled resource consumption and should have limited hardware capacity. The increase in complexity of embedded real-time systems leads to the increasing demands with respect to requirements engineering, high-level design, early error detection, integration, productivity, verification and maintenance that increases the importance of an efficient management of life-cycle properties such as maintainability, portability, and adaptability.

II. EXISTING SYSTEM

The existing system is used for enabling better security for women by the use of embedded technology. To provide life saving alert system during emergency situations. To ensure immediate security alert by using GPS, GSM arduino controller and a wide range of sensors. The principal behind this device is to detect the body parameters from the corresponding sensors that are attached to the body of the victim under threat conditions and sends signal to the controller. The various sensors such as flex sensor, temperature MEMS 2 sensor, accelerometer, sound sensor, pulse rate sensor are placed in the body of the women to measure the rate. If the detected rate values of sensor signal crosses the threshold limit, the buzzer is activated and GPS sends signal to the controller from which the alert message via GSM to the corresponding contacts.

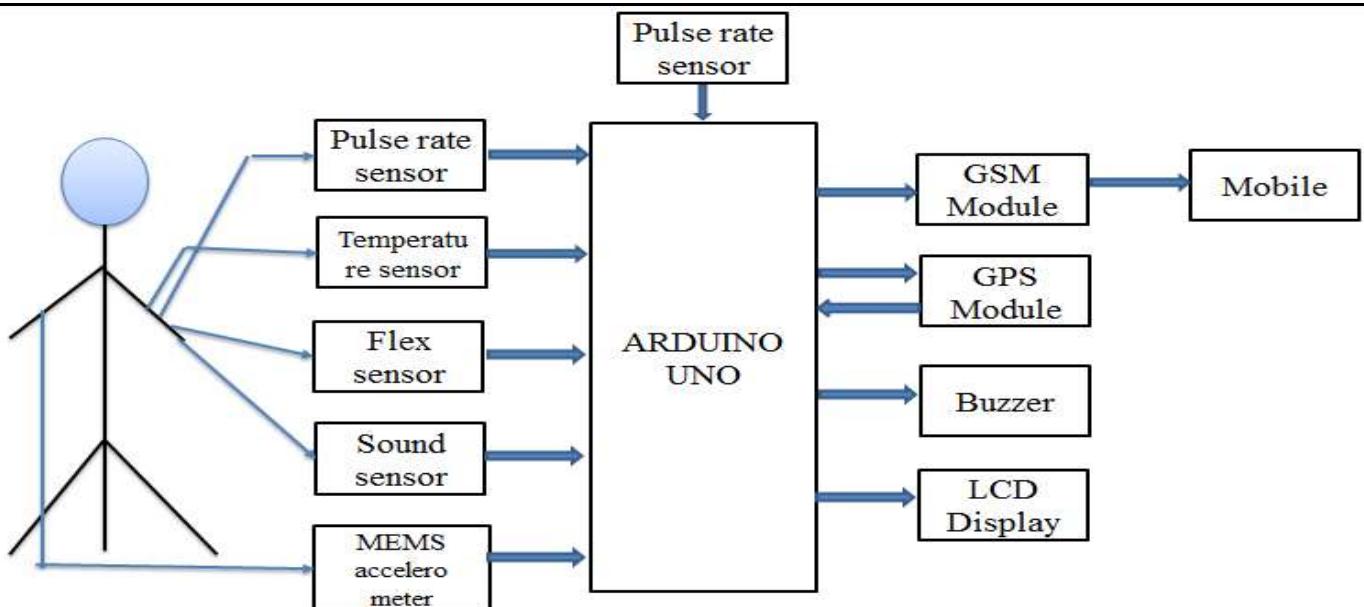


Fig 1:

Existing system flow chart.

III. PROPOSED SYSTEM

Here we have modified the base paper as portable smart security device for women safety. The main components are arduino Nano, GSM, GPS module, pulse rate sensor, voice recognition module and mobile phone. In the Arduino Nano maximum of 4 members contacts are predefined in it. If the user in trouble, then the user should press the button to send the location or information to the specified contacts. If the user is not able to press the button then the voice recognition is used to send the information then our body pulse rate is sensed by the sensor to send information to the contacts by using GPS and GSM module. The user voice already recorded and predefined in the arduino using particular sentence for example Help me or Am in trouble. If the user says like this the device start working or else if the user can't do alone then the GPS location is shared to the contacts based on pulse rate. The device will update the location for every 5 minutes to the contacts which are predefined in the Arduino Nano.

IV. HARDWARE DESCRIPTION

Arduino Nano

Arduino NANO is a microcontroller development board based on the ATMEGA328P microcontroller IC. The microcontroller IC on which the Arduino NANO is based is usually the same as in the Arduino UNO, by the way sometimes the difference lies in the package type of the microcontroller IC. As the microcontroller IC on both the Arduino UNO and Arduino NANO are same, they have same crucial specifications. When there is limitation on the space constraint, the Arduino NANO is sometimes preferred over the Arduino UNO. Arduino NANO is quite small in size as compared to the Arduino UNO and can easily be mounted on the Breadboard making and it is useful in Breadboard based prototypes. It has 14 Digital Input / Output pins and 8 analog pins. The Arduino NANO has two additional supporting Analog to Digital converters. As compare to the Arduino UNO so that NANO has two additional Analog pins. It has one UART, one Inter-Integrated Circuit (I2C) computer bus and one Serial Peripheral Interface (SPI) computer bus. As same as the Arduino NANO, the Arduino UNO also has one UART, one SPI and one I2C interface on board. The 5 PWM (Pulse Width Modulation) pins are enabled out of 14 digital input/output. The Arduino NANO looks like the one in the following figure:

**Arduino
NANO**

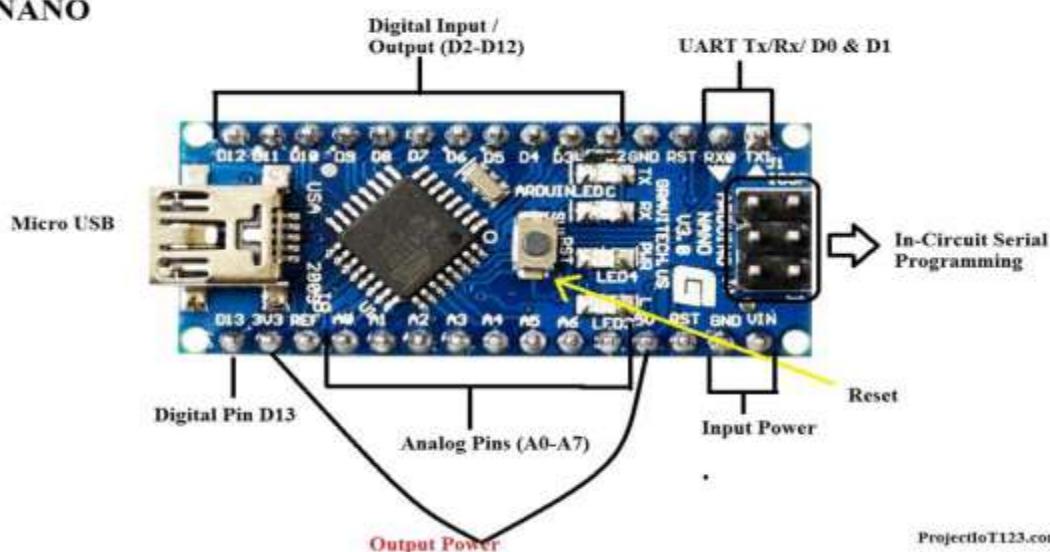


Fig 2: Arduino NANO

V. SOFTWARE DESCRIPTION

Arduino Programming

It is easy to use programming language and programming for beginners, that make Arduino NANO quite popular among the hobbyists. C++ programming language is used by the Arduino NANO. The Arduino NANO IDE has a well-defined function so it is easy to remember for each task. As an example the function that specifies the Arduino NANO digital Input / Output pin to work as input is :pin Mode(12,INPUT); Here in this function there are two arguments. First argument is the pin number which we want to make input or output and second argument specifies the property that is input or output to the pin number used.



```

Tech_guide_neo_6m: Arduino 1.8.9 (Windows Store 1.8.21.0)
File Edit Sketch Tools Help
Tech_guide_neo_6m
Serial Monitor
#include <TinyGPS++.h>
#include <SoftwareSerial.h>

static const int RXPin = 4, TXPin = 3; // Here we make pin 4 as RX of arduino & pin 3 as TX of arduino
static const uint32_t GPSBaud = 9600;

TinyGPSPlus gps;

SoftwareSerial ss(RXPin, TXPin);

void setup()
{
  Serial.begin(9600);
  ss.begin(GPSBaud);
}

void loop()
{
  if (ss.available() > 0) {
    if (!gps.parse(ss.read()))
      continue;
    if (gps.location.isValid())
      Serial.print("Lat: ");
      Serial.print(gps.location.lat());
      Serial.print(" Lon: ");
      Serial.print(gps.location.lng());
      Serial.println();
  }
}

```

The screenshot shows the Arduino IDE interface with the sketch named "Tech_guide_neo_6m". The code includes #include statements for TinyGPS++ and SoftwareSerial, defines pins RXPin=4 and TXPin=3, sets GPSBaud to 9600, initializes a TinyGPSPlus object, and sets up the serial connection. The main loop reads from the serial port and prints GPS coordinates to the Serial Monitor. A status message at the bottom indicates memory usage: "Sketch uses 6228 bytes (25%) of program storage space. Maximum is 32256 bytes. Global variables use 514 bytes (25%) of dynamic memory, leaving 1534 bytes for local variables. Maximum is 2048 bytes."

Fig 3: Source code

VI. IMPLEMENTATION RESULT

There are three main steps that the user should do to send the location to their contacts, the first one is that the user should press the button when she is in threat, the second one is when the user can't able to press the button, then she may use her voice which is already predefined in it to send the location as information, finally the third one is that the user can't able to do the above two things, the pulse rate of the victim which is increased beyond the threshold limit will be used to send the users location as information to their friends contact which is already specified in the microcontroller.

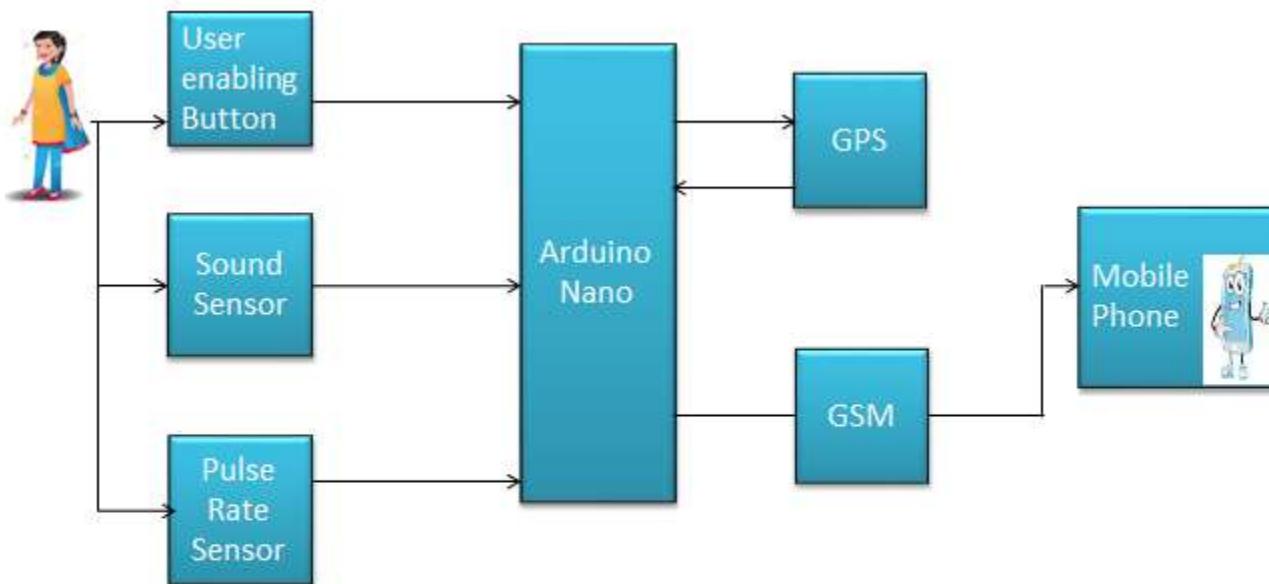


Fig 4: Block diagram of proposed system

- STAGE1: The information from the user is given to the arduino Nano.
- STAGE 2: The signal is given to the GPS module which transmits back the latitude and longitude of the user to the arduino.
- STAGE3: The user location is given to the specified contacts through the GSM.

VII. CONCLUSION

The developed system is highly effective in the sense that it helps the person who is in threat to intimate their friends or contacts that the person is in some problem. This implementation make the designed system unique and effective compared to the previous proposals.

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