International Journal of Innovative Research in Engineering
Volume 4, Issue 3(May-June 2023), PP: 370-374.
www.theijire.com **ISSN No: 2582-8746**

Design and Implementation of Wearable Device for Women Using GSM

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How to cite this paper:
Jayasuriya.M[1], Lokeswaran.S[2], Prakash.A[3], Varadharajan.A[4], R.S.Koteeshwari[5]," Design and Implementation of Wearable Device for Women Using GSM ", IJIRE-V4I03-370-374.

https://www.doi.org/10.59256/ijire.20230403102

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Abstract: *Recently personal security has become a sensitive issue. Small kids, ladies, as well as aged people need to have their secure against kidnapping, rape,chain snatching respectively. There are different areas & scopes of security. Recent social incidents gave us motivation to develop personal security system. Kids, aged people & ladies mostly not able to fight to criminal for self security. Today's world is full of rush and most of the women work independently to support their family. They have to work till late night. For such women, safety is the most important requirement. The security issue for such women comes forward because cases of harassment and rapes on those women are increasing. Best suitable system for those women will be a portable system which the women will be able to carry will her and easy to use portable system will generate a shock which willmake to attacking person to get back*

Key Word: *Safety; GPS; Mobile; Circuit; Receivers.*

I.INTRODUCTION

Our life has became to fast now-a-days. To remain part of this fast life women also works a lot to survive and supports their family. They work at different places like IT firms and so many places like it. After completion of their duty they have to go home late night so anything may happen at such timings as well as there is a chance of harassment at lonely places. For this purpose portable system is designed which can be easily carried with the women. Communication of alarming situation & prevention of incident has achieved by GPS, GSM technology, and defensive system respectively. This is the aim of our system. as a result the design is separated into two parts. The message of the offense throughout wireless and prevention of the crime.

In this system shocking system with automation & alarm has been used for defence. Pulse rate sensor, pressure switches, & manual switches contribution has been considered for alarming, defensive situation, as well as communication. The text message will be send to the added data based people at destination for instant help to the user. user will have freedom to add choice people's data base number. Family member, doctor & police will have immediate indication to help user in disaster situation.

The continued improvement in size, cost, and power of integrated circuits has enabled entirely new classes of wearable devices. Unfortunately, these new devices are still limited by current battery technology, which in many cases is heavy, expensive, and unable to store sufficient power for long-term biomedical sensing. Therefore it makes sense to embed energy avenging within aconventional shoe.

Furthermore, due to the large numbers of injuries and conditions associated with high-intensity athletic activities, podiatric sensing is a natural application for this harvested energy sensor system Although you may not be using a Get Smart-style shoe phoneanytime soon, it is possible that your mobile phone may end up receiving its power from your shoes.

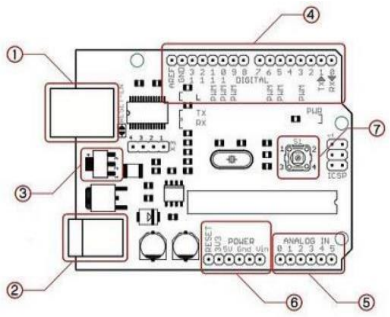
University of Wisconsin-Madison engineering researchers Tom Krupenk in and J. Ashley Taylor have developed an in-shoe system that harvests the energy generated by walking. Currently, this energy is lost as heat. With their technology, however, they claim that up to 20 watts of electricity could be generated, and stored in an incorporated rechargeable battery. The process is said to have a power density of up to one kilowatt per square meter (10.76 sq. ft.), plus it works with a wide range of mechanical forces, andis able to output a wide range of c//urrents and voltages.

II. MATERIALS AND METHODS

Arduino Uno R3 Microcontroller:

The Arduino Uno R3 is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of

which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and areset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or powerit with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip Instead, it features the Atmega16U2(Atmega8U2 up to version R2) programmed as a USBto-serial converter. Revision 2 of the Uno board (A000046) has a resistor pulling the 8U2 HWB line to ground, making it easier to put into DFU mode.



Specification:

- Microcontroller: ATmega328
- Operating Voltage: 5V
- Input Voltage (recommended): 7-12V
- Input Voltage (limits): 6-20V
- Digital I/O Pins:14(of which 6 provide PWM output)
- Analog Input Pins: 6
- DC Current per I/O Pin: 40mA
- DC Current for 3.3V Pin: 50mA
- Flash Memory: 32KB (ATmega328) of which 0.5 KB used by boot loader
- SRAM: 2KB(ATmega328)
- EEPROM: 1KB(ATmega328)
- Clock Speed: 16MHz

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)
EEPROM	1 KB (ATmega328P)
Clock Speed	16 MHz
LED_BUILTIN	13
Length	68.6 mm
Width	53.4 mm
Weight	25 g

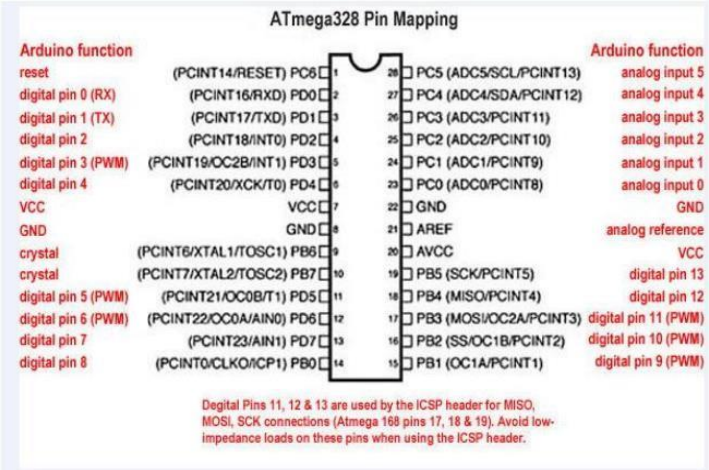
Power: The Arduino Uno can be powered via the USB connection or with an external power supply. The adapter can be connectedby plugging a 2.1mm centre-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector. The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts. The power pins are as follows:

VIN: The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.

5V: The regulated power supply used to power the microcontroller and other components on the board. This can come either from VIN via an onboard regulator, or be supplied by USB or another regulated 5V supply.

3V3: A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.

GND: Ground pins.



Input and Output: Each of the 14 digital pins on the Uno can be used as an input or output, using pin Mode(), digital Write(), anddigital Read() functions. They operate at 5 volts. Each pin can provide or receive a maximum of 40 m A and has an internal pull-upresistor (disconnected by default) of 20-50 k Ohms. In addition, some pins have specialized functions:

Serial: 0 (RX) and 1 (TX). Used to receive (RX) and transmit (TX) TTL serial data. These pins are connected to the correspondingpins of the ATmega8U2 USB-to-TTL Serial chip.

External Interrupts: 2 and 3. These pins can be configured to trigger an interrupt on a low value, a rising or falling edge, or a change in value. See the attach Interrupt() function for details.

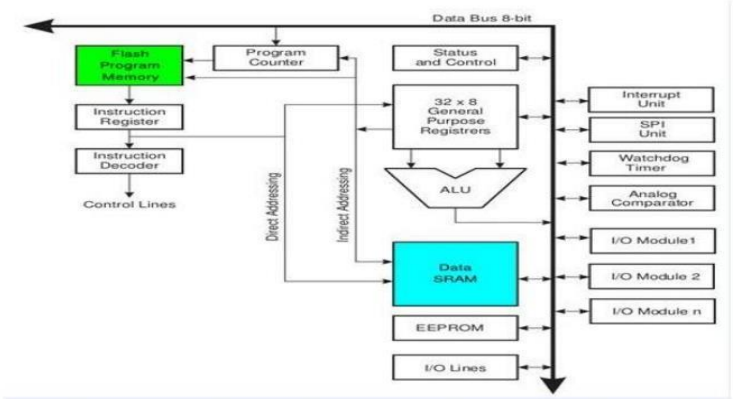
PWM: 3, 5, 6, 9, 10, and 11. Provide 8-bit PWM output with the analog Write() function.

SPI: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK). These pins support SPI communication using the SPI library.

LED:13. There is a built-in LED connected to digital pin 13. When the pin is HIGH value, the LED is on, when the pin is LOW, it's off. 3 | P a g e 3 Arduino Uno The Uno has 6 analog inputs, labelled A0 through A5, each of which provide 10 bits of resolution(i.e. 1024 different values). By default they measure from ground to 5 volts, though is it possible to change the upper end of their range using the AREF pin and the analog Reference() function. Additionally, some pins have specialized functionality:

I2C: 4 (SDA) and 5 (SCL). Support I2C (TWI) communication using the Wire library. There are a couple of other pins on the board:AREF. Reference voltage for the analog inputs. Used with analog Reference(). Reset. Bring this line LOW to reset the microcontroller. Typically used to add a reset button to shields which block the one on the board.

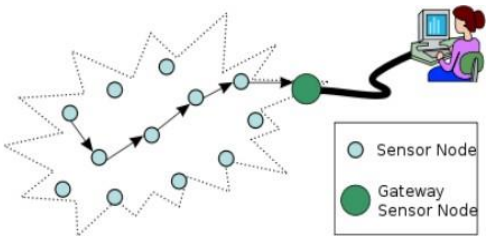
ATmega32U4 Architecture



III.RESULT

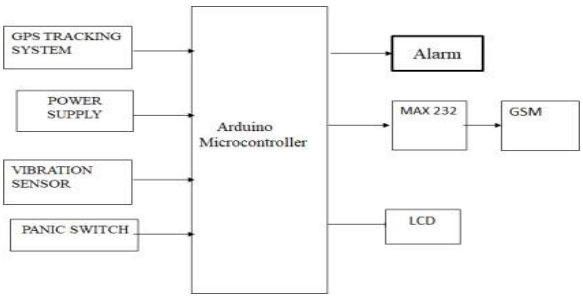
The vibration sensor and manual switches contribution has been considered for alarming, defensive situation, as well as communication The message will be send to the added data based people at destination for instant help to the user then will have freedom to add choice people's data base number self protection shoe at the first sight Portable system will generate a shock which will make to attacking person to get back. After generation of shock the message will be sent with the help of Global System for Mobile Communication (GSM) on the particular number stored and the location of those women is traced with the help of Global Positioning System (GPS). If the message is not checked by the particular number mentioned, the system will continuously give the call until the message is checked by the particular number mentioned. Suddenly that person stun that moment and person ran to anyplace Then again double time press mean send message to 5 person they are parents, police, closure relation, emergency rescue etc.

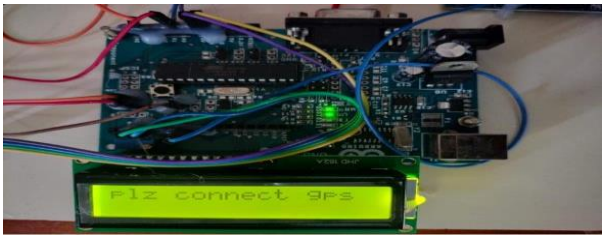
In the last few years, there has been an increasing demand for low power and portable-energy sources due to the development and mass consumption of portable electronic devices. Furthermore, the portable energy sources must be associated with environmental issues and imposed regulations. In this scope, piezoelectric materials become a strong candidate for energy generation and storage in future applications. This paper describes the use of piezoelectric polymers in order to harvest energy frompeople walking and the fabrication of a shoe capable of generating and accumulating the energy.



The WSN is built of "nodes" – from a few to several hundreds or even thousands, where each node is connected to one (or sometimes several) sensors. Each such sensor network node has typically several parts: a radio transceiver with an internal antenna or connection to an external antenna, a microcontroller, an electronic circuit for interfacing with the sensors and an energy source, usually a battery or an embedded form of energy harvesting. A sensor node might vary in size from that of a shoebox down to the size of a grain of dust, although functioning "motes" of genuine microscopic dimensions have yet to be created. The cost of sensor nodes is similarly variable, ranging from a few to hundreds of dollars, depending on the complexity of the individual sensor nodes. Size and cost constraints on sensor nodes result in corresponding constraints on resources such as energy, memory, computational speed and communications bandwidth. The topology of the WSNs can vary from a simple star network to an advanced multi-hop wireless mesh network. The propagation technique between the hops of the network can be routing or flooding.

Block Diagram:





IV.DISCUSSION

Working: This paper clearly uses two main modules of GSM and a microcontroller. Whenever the user press the panic button inthe encoder the microcontroller pin gets low and it starts to allow GPS to send location information to GSM. Through the AT commands all those messages reaches the microcontroller. Using AT Commands GSM will sends the help message along with latitude and longitude values to the registered mobile numbers in the code. Normally, we prefer two mobile numbers to be registeredin the code. If necessary we can use mobile numbers up to four , if we need to use more than four it takes time to send message.

Advantages:
1. It is very easy to use
2. Easy to maintain
3. Used for security purposes
4. Mobile number can be changed easily

Applications:
1. Security appliances.
2. It will be used for safety of a. Women's b. Physically challenged people c.Children
3. It will be used for child tracking during school time.
4. Automotives and transport vehicles
5. Security, remote monitoring, transportation and logistics.

V. CONCLUSION

Now a day's being safe and secure is very important for women. Our main aim of this project is to design a system which is very easy to handle and provide personal security system. This design will deal with most of the critical issues faced by women and willhelp them to be secure. Existing systems provide the safety by using the internet connection through apps in the android mobiles andtracking the vehicle this type of security mechanism is very difficult to use. The proposed system will provides the latitude and longitude values of location of the victim which can further be tracked using Google maps. By using this system we can reduce the crime rate against the women. Women's security is a critical issue in current situation. The crimes can be reduced with the help of real time implementation of our proposed system.

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