Women Safety Device With GPS Tracking And Alerts

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Abstract : Women Safety Device with GPS Tracking and Alerts is a system designed for women safety. The system ensures the safety of women by monitoring the heartbeat. The heartbeat is monitored from the moment the system is switched on. When the heartbeat is increased beyond the normal range, GSM module sends the current location obtained from GPS module to pre-stored contacts 3 times. Earlier, the human input was in need in order to send the emergency signal. But by this system, we eliminate the need of human interaction. Here, the system automatically detects if there is an emergency situation, and takes action i.e. sending the alert message of current location to the pre-stored contacts.

IndexTerms: **GPS module, Encoder-Decoder IC, heartbeat sensor, hybrid module**

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I. INTRODUCTION

In today's world, Women safety has become a matter of prime concern as the crime against women are taking a heavy toll. The project works on principle of women safety by taking into account her heartbeat and location. The heartbeat sensor monitors the heartbeat. GPS module determines the location coordinates. GSM module is used to send the emergency message to pre-stored contacts.

When the woman is passing through suspicious area with the device active, heartbeat sensor constantly monitors the heartbeat of the person. If a major change of heartbeat is detected, then the GPS module determines the location of the woman. The coordinates obtained are sent via GSM module to pre-stored contacts.

1.1 COMPONENTS

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Power supply	HT12E IC
Arduino NANO	HT12D IC
16x2 LCD Display	RF Transceiver
GPS NEO6MV2	Push button
GSM SIM800A	7805 IC (Voltage regulator)
Heartbeat sensor	Potentiometer

II. BASIC INFORMATION
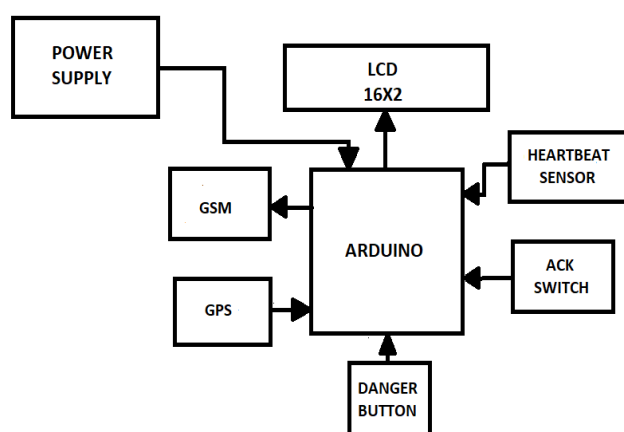
Block Diagram

The supply of power is from a 12V alkaline battery which is of a very compact size. The Arduino NANO used here is Atmel ATmega328 which has an operating voltage of 5V and consists of 14 input/output pins from which 6 pins provide PWM output. It can also be powered by 6-20V power supply. The LCD screen used is 16x2 which is widely used in many applications. It has 1280 pixels. The LCD is used in 4-bit mode. The LCD will display the heartbeat as well as the coordinates as per the input given. The GPS module used is NEO6MV2 which has a power supply range of 3V-5V. Its default baud rate is 9600 bps. GSM SIM800A is used by the use of which we will send messages to the pre-stored contacts in it. The power supply required by it is between 3.4V to 4.4V. The heartbeat sensor used has a working voltage of 5V and measures the heartbeat in BPM that is Beats

per minute. The HT12E and HT12D Encoder-Decoder IC is used to encode the data on transmission end and decode the data on receiving end. The transmitter and receiver used are of ASK hybrid module. Together, they are known as RF Transceiver. LM7805 IC Voltage Regulator is used so any fluctuations don't affect other parts of the system. The input voltage is 7V-35V while it provides steady 5V output as well as a heat sink. The potentiometer is used to vary voltage.

2.1 FLOWCHART
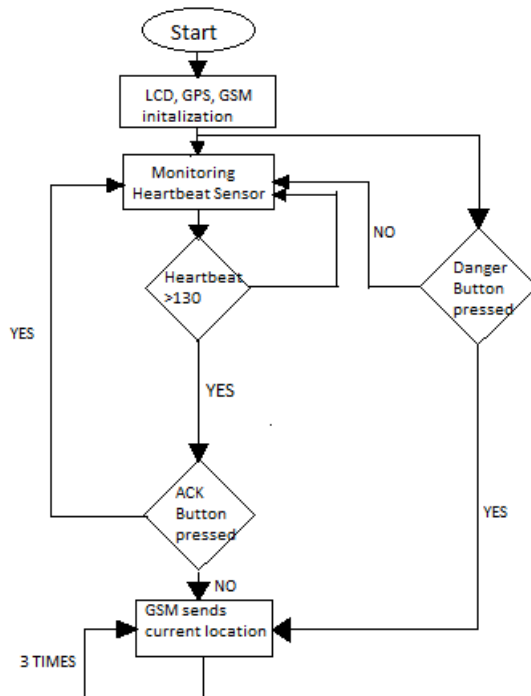
Here, the working process in shown in form of a flowchart. At soon as the power supply is switched on, LCD display, GPS module, GSM module are started. The heartbeat sensor is also activated and it starts monitoring. Heartbeat sensor keeps on monitoring the heartbeat. Until the heartbeat is below 130 the loop keeps on repeating. As soon as the the heartbeat goes out of the limit, GPS determines the current location coordinates. If the Acknowledge button is pressed then the loop stops going further and returns to monitoring of heartbeat. If it is not, then GSM module sends the location coordinates obtained from the GPS module to the pre-stored contacts 3 times. This is the whole process. Other than this, we also have a danger button. If the danger button is pressed, then the message containing the location coordinates is directly send to the pre-stored contacts 3 times.

III .WORKING

The whole circuit works on 5V power supply. As soon as power is supplied, heartbeat sensor starts monitoring the pulse rate. The data obtained is encoded by the encoder and transmitted via transmitter. On the other hand, the data is received at the receiver. The decoder decodes it and displays it on the LCD Screen. If the heartbeat is below 130, the heartbeat sensor keeps on monitoring the pulse-rate. If the heartbeat goes above the specified value i.e. normal heart rate, then the GSM module will send the current location obtained from GPS module to the pre-stored contacts 3 times. Separately, a Danger button is also there, in case the person feels anything weird then she can directly press it. The message of the location will be sent to the pre-stored contacts.

This below image is a representation of band and how it will look on the person's hand. The band is comfortable and is having a good aesthetic look. The band consists a heartbeat sensor, a battery, and transmitter. When the supply is switched on by connecting the wires, the heartbeat sensor starts monitoring the heartbeat. The output of the heartbeat sensor is transferred to the LCD screen on the hardware part via transmitter. On the band, the transmitter, transmits the data. On other hand, the receiver which is installed on hardware portion receives the data and displays it on the LCD screen.

3.1 SIMULATION
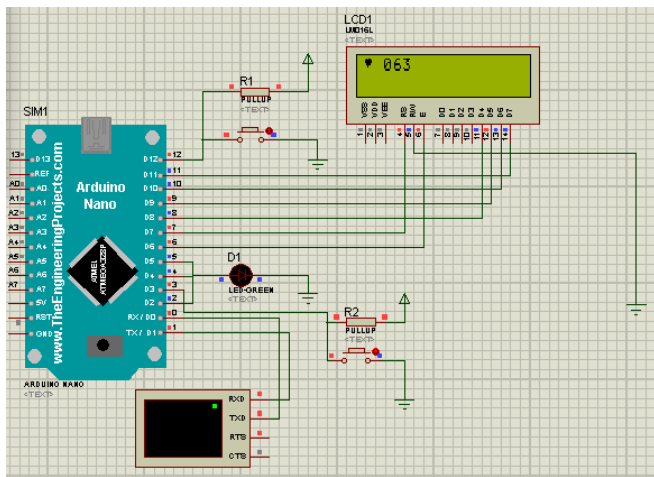
The above figure shows the simulation of the device. Here, the heartbeat sensor is working and monitoring the heartbeat of the person. The output obtained from the heartbeat sensor is being displayed on the LCD screen.
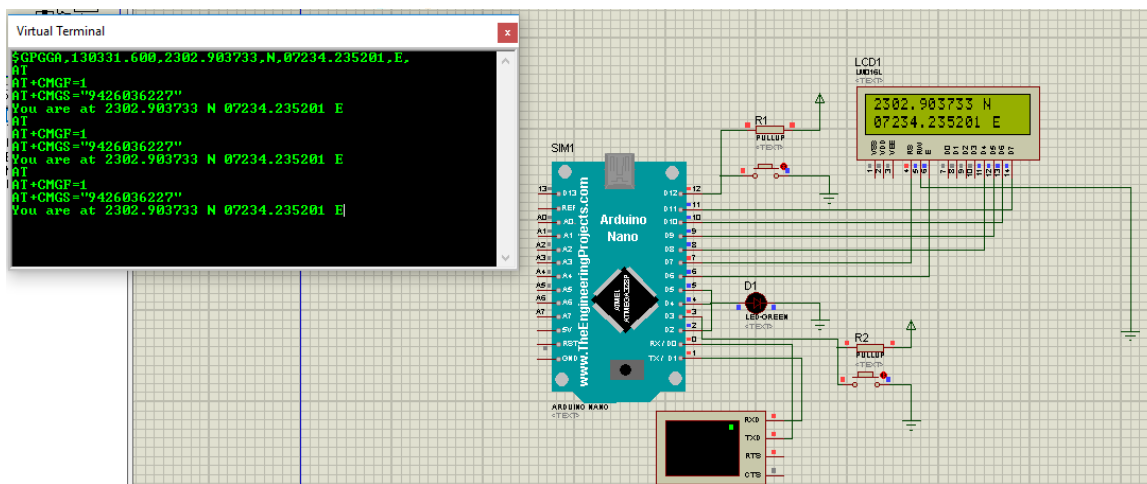

The above figure shows the action taken by the device when the heartbeat goes beyond the specified limit. As the heartbeat sensor read the value that is beyond the limit, it detects the current location of the device. That location is being displayed on the LCD screen. Now, this location will be sent to the pre-stored contacts. The terminal on the left is showing the message comprising of coordinates that are sent to the pre-stored contacts.

3.2 IMPLEMENTATION
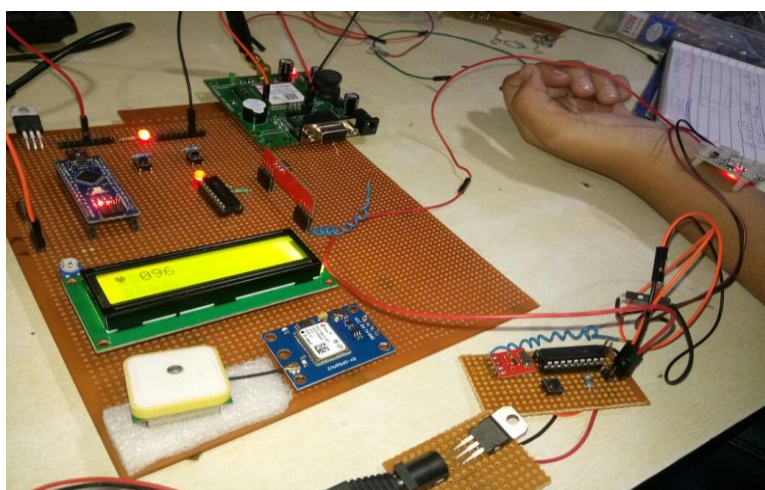
Here, you can see the actual implementation of the project. The working of all the parts is being seen. The heartbeat sensor is monitoring. The LCD is displaying the monitored heartbeat.

IV. RESULTS AND CONCLUSION
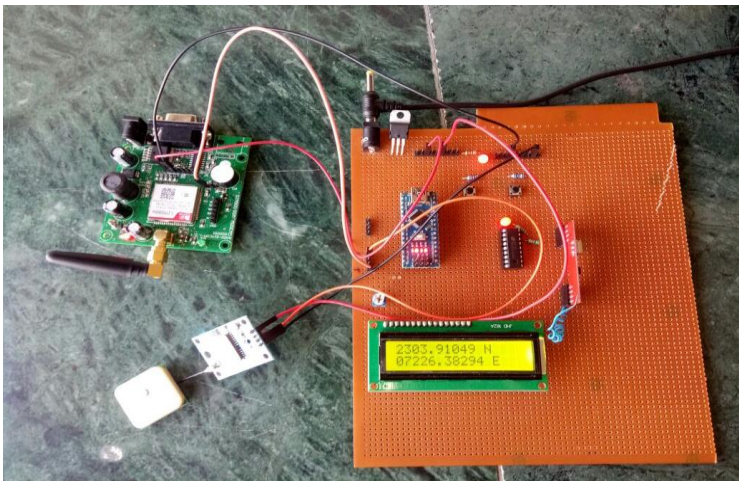
Coordinates displayed

The above image displays the result that is obtained after the implementation. After the heartbeat sensor has detected the heartbeat that is out of the limit, GPS detects the current location. That location is displayed on the LCD Screen. This location will be sent to the Pre-stored contacts 3 times via GSM module.
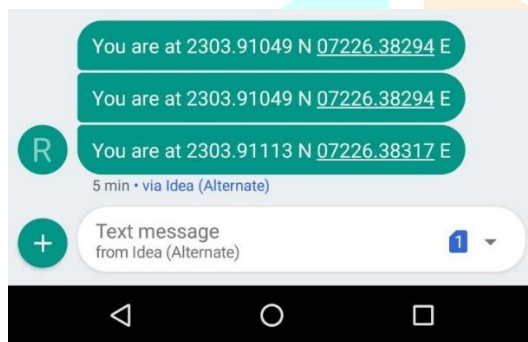
Here, the figure shows the received messages from the device. They are containing the location of the device.

4.1 Advantages

- The device is of band type, so carrying it is not a problem, directly have to wear it in hand.
- The big advantage of this device is it eliminates human interaction. So, as a result there is no error or mistake in case of emergency situations.
- The system works on monitoring of the heartbeat. So, its very accurate and fast.
- It can also be linked to mobile applications or else a different application for this can also be developed. So, it is technology friendly as well as comfortable to use in vivid ways.
- The whole project parts are light weight and small so no weight problem.
- The power supply is very efficient and long lasting so no worry for the battery duration.
- The band is made in such a way that the power supply can be changed when it is fully discharged.

V. ACKNOWLEDGEMENT:

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VI. REFERENCES

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