AN ELECTRICAL SHOCK-BASED LOCATION-TRACKING SAFETY SYSTEM FOR WOMEN

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ABSTRACT— In this Project, we provide a GPS and GSM-based system for monitoring the whereabouts and safety of female users. A GPS receiver, microcontroller, and GSM modem make up this sensing and communicating system. The GPS Receiver obtains its coordinates (in latitude and longitude) from orbiting satellites. This data is processed by the microcontroller and sent to the user through GSM modem. The MCU may connect with a GSM modem through an interface. The GSM modem will send a text message to the selected phone number. If a woman feels threatened and needs to defend herself, she might activate her protective switch. When the button is pressed, the complete system goes into action, sending an SMS to the appropriate contact along with the user's precise position through GSM and GPS. When engaged, the technology delivers an electric shock, protecting women against physical assault.

Introduction:

In this Project, we provide a GPS and GSM-based system for monitoring the whereabouts and safety of female users. The neighbours may be notified through an integrated alarm system. A GPS receiver, microcontroller, and GSM modem make up this sensing and communicating system. The GPS Receiver obtains its coordinates (in latitude and longitude) from orbiting satellites.

This data is processed by the microcontroller and sent to the user through GSM modem. The MCU may connect with a GSM modem through an interface. The GSM modem will send a text message to the selected phone number. If a woman feels threatened and needs to defend herself, she might activate her protective switch. When the button is pressed, the complete system goes into action, sending an SMS to the appropriate contact along with the user's precise position through GSM and GPS.

Being secure means that you are safe from harm or loss. It's acceptable to say that security and safety are conceptually identical in the broadest sense. The distinction lies in the latter's focus on security against external threats. The security breach is the result of an individual or group's interference with the safeguarded state. The word "security" is sometimes used interchangeably with "safety," but in technical contexts, it indicates not just that something is secure, but also that it has been secured.

The ATmega328 microcontroller is used in the development of this project. In this Project, we provide a GPS and GSM-based system for monitoring the whereabouts and safety of female users. Neighbors may be notified through an integrated alarm system. A GPS receiver, microcontroller, and GSM modem make up this sensing and communicating system. The GPS Receiver obtains its coordinates (in latitude and longitude) from orbiting satellites.

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When engaged, the technology delivers an electric shock, protecting women against physical assault.

The power source for this project is a 5V, 750mA regulated supply. The voltage is controlled using a 7805 three-terminal regulator. The secondary ac output of the 230/12V step down transformer is rectified using a bridge type full wave rectifier.

BLOCK DIAGRAM:
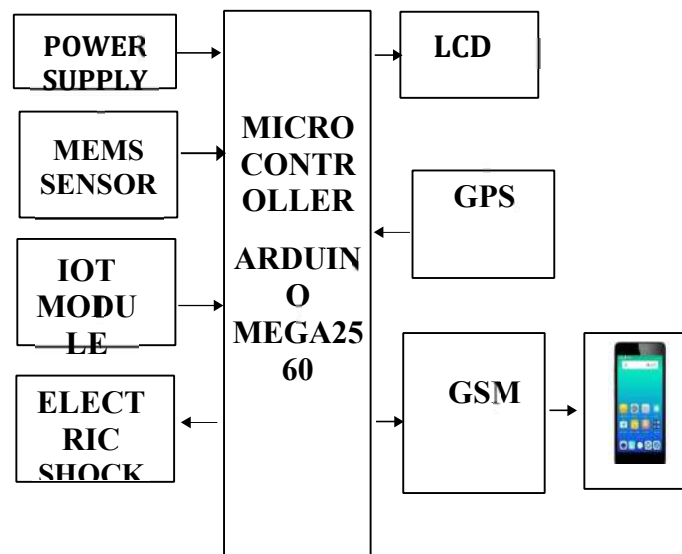
Description Of Block Diagram:

The above figure shows the block diagram of the project entitled "An Electrical Shock-Based Location-Tracking Safety System For Women".

In order to complete this task, you will need the following:

1. Microcontroller (Arduino Mega): A microcontroller is a small integrated circuit programmed to operate a single function in an embedded system. A microcontroller is a single-chip computer that combines a central processing unit (CPU), memory, and I/O (input/output) circuitry.

2. Electrical energy is supplied to devices by a power source. Typically, this word refers to devices that are built right into the equipment that has to be powered.

3. Micro electro mechanical system (MEMS) sensors combine electrical and mechanical components on a single chip to create a compact device.

4. The Global Positioning System (GPS) module tracks your current position.

It maintains a record of the current position in the form of longitude and latitude. The GPS Coder Module, which is directly connected to USART of the microcontroller, will use this data to find the street name and nearby intersection for the given coordinates. This module provides accurate positioning, navigation, and timing services to users around the world, 24/7/365, no matter the weather or time of day or night. In the event that GPS is turned off, the system will instead use SMS to relay the coordinates. Therefore, access to the web is essential.

5. The fifth component is the GSM module, which is what a computer needs in order to talk to a GSM-GPRS system. Inserting a SIM card compatible with the Global System for Mobile Communication (GSM) into the mobile device enables it to send and receive text messages via GPRS. The number from the GSM SIM card has been stored in the database. As GSM's popularity grows, the network's capabilities have extended beyond voice calls to include things like machine automation and M2M connectivity. It may function in either the 900 MHz or 1800 MHz range.

6. IoTModule(ESP-12E): The Internet of Things (IoT) has developed as a consequence of the integration of the physical world into digital systems via advances in real-time analytics, machine learning, commodity sensors, and embedded systems.

The Internet of Objects (IoT) is a system of interconnected physical devices, cars, buildings, and other things that use their built-in physics, software, sensors, actuators, and network properties to collect and share data.The Internet of Things (IoT) paves the way for further direct integration by enabling remote sensing and control of things via preexisting network infrastructure.

7. Notebook and other compact computers employ a display technology called liquid crystal display (LCD). LCDs, together with gas plasma and light-emitting diode technologies, make it possible for screens to be considerably thinner than those using cathode ray tubes.

8. ELECTRICAL SHOCK: When triggered, the technology protects women against physical abuse by means of an electrical shock.

MEGA2560 Arduino: The Arduino board is an open-source microcontroller board that utilises the Atmega 2560 microprocessor. This board's development environment runs the wiring language for processing. These boards have revitalised the automation sector by providing an accessible learning environment where anyone with little or no technical experience may quickly acquire the fundamentals required to programme and operate an Arduino board. Alternatively, we may link to software on your PC, such as Max MSP, Processing, or flash, and utilise these boards to expand standalone interactive creations.

SOFTWARE: Software simulation is crucial to the proper completion of the process of Hardware implementation. What does it imply, exactly, when software is simulated? We can now get down to business. Modeling a physical phenomena using a set of mathematical formulae and simulating the results in software.

It's basically a software that mimics real-world actions so that the user may see them unfold onscreen without having to risk their own safety by trying them out first. One way a professional could demonstrate the functionality of his software to a client is via the use of a simulation. To add to that, he may make it interactive so that customers can hone down on the specifics that most pique their interest.

Proteus version 8 has been our primary simulation tool throughout this project. The following is a list of other necessary software packages to use in conjunction with it.

Algorithm

1. Powering the circuit triggers the initialization of the GPS, GSM, LCD, and MEMS sensor.
2. The GPS readings are being updated, and it will be waiting for sensor values.
3. It will alert a family member through text message and activate shock protection if the sensor detects anything out of the ordinary.
4. If the sensor is functioning normally, Shock protection is off and the GSM will wait for sensor abnormality.
5. When the shock is turned on, a message appears on the LCD screen so that the project may be seen visually.
6. The procedure ends and is completed.

FLOW CHART:
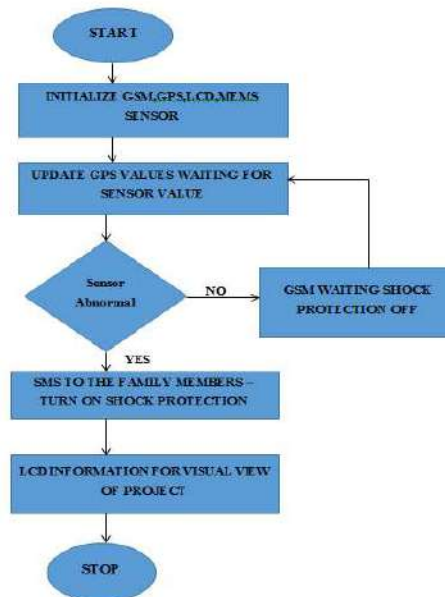
Result Analysis

Finally, we have accomplished our mission. All hardware implementation resources are now in our possession. So, to sum up the whole process, we have:
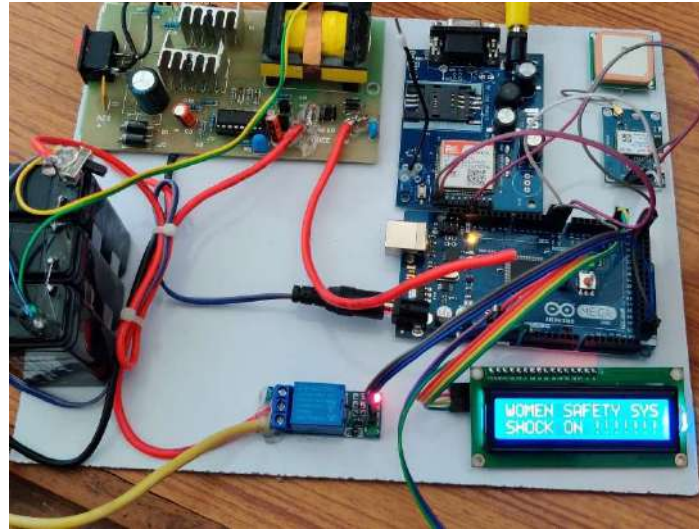
Result:

We were able to complete the circuit's implementation process at last.

Constraints of the current circuit design:

The following are some of the constraints of this project:

Firstly, this device has a limited range and frequency range of operation.

Second, the user may get shock treatment from the weather.

We've seen the experiments, spoken about the findings for the project circuit, and seen the outcomes. The circuit's restrictions have also been outlined. However, there are benefits to using this circuit as well, and we'll examine them presently.

Conclusion:

The " An Electrical Shock-Based Location-Tracking Safety System for Women " project has been developed and tested. The characteristics of the various hardware components employed in its creation. Each component's presence has been meticulously planned, and its placement has been optimised, to ensure the unit functions at its peak. Second, the project was effectively accomplished with the support of cutting-edge ICs and developing technologies.

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