

Advanced Security System for People in Public Places

Poovarasani.S¹ Nivetha.T²

^{1,2}Assistant Professor

^{1,2}Department of Electronics and Communication Engineering

^{1,2}N.S.N College of engineering and technology, Karur-639 003

Abstract— Today in the current global scenario, the prime question in every girl's mind, taking into account the ever rising increase of issues on women harassment in recent past, is only about her safety and security. This paper suggests a new perspective to use technology to protect women. The system resembles a normal belt which when activated, tracks the location of the victim using GPS and sends emergency messages using GSM, to three emergency contacts and the police control room. The system also incorporates a screaming alarm that uses real-time clock, to call out for help and also generates an electric shock to injure the attacker for self defense. The main advantage of this system is that the user does not require a Smartphone unlike other applications that have been developed earlier. The belt provides with all the features which will leave no stone unturned to help the victim in any kind of emergency situations. Kids, aged people & ladies mostly not able to fight to criminal for self security. Sometime government security may not give on time support. For developing smart system two factors has been considered i.e. prevention of incident & cure of incident.

Keywords: PRS: pulse rate sensor, VCS: voice code sensor application, WSN: wireless sensor network, LBS: location based service

I. INTRODUCTION

The research and engineering challenges along the way to this vision encompass many technical fields including physics, chemistry, biology, mathematics, computing science, systems, mechanical, electronics and civil engineering. Each must be identified or, if already existing, tailored for the appropriate application. Associated with this would be the interface to the computerized "monitoring" capability for each given function. Smart City will take advantage of communication and sensor capabilities sewn into the cities' infrastructures to optimize electrical, transport, and other logistical operations supporting daily life, thereby improving the quality of life for everyone. It would be overly simplistic, and probably a big mistake, to believe that traditional networking technologies can simply be added into a city's critical infrastructure to make it "smarter". In addition, since the assumptions and requirements for smart critical infrastructures are very different, implying that networks for smart cities should be engineered quite differently, this also raises an integration problem. 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. 1) message of the offense throughout wireless 2) Prevention of the crime. Liquid spray pump system, shocking system with automation & alarm has been used for defense. 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. Fear situation of user will be studied by different bio sensors. Biosensors are capable of measuring significant physiological Parameters like heart rate, blood pressure, body and skin Temperature, oxygen, saturation, respirationrate, electrocardiogram. The vision of "Smart person security" is the urban center of the future, made safe, secure, environmentally, green, and efficient because all structures, whether for power, water, transportation, etc. are designed, constructed, and maintained making use of advanced, integrated materials, sensors, electronics, and networks which are interfaced with computerized systems comprised of databases, tracking, and decision-making algorithms.

A. Existing System:

Keeping the same concern in mind many developers have come up with innovative applications. Few of such applications are as follows- 1. VithU app: This is an emergency app initiated by a popular Indian crime television series "Gumrah" aired on Channel. In this app when the power button of the Smartphone is pressed twice consecutively, it will begin sending out alert messages with a link to the location of the user every two minutes to the contacts fed into the app. 2. SHE (Society Harnessing Equipment): It is a garment designed by three engineers from Chennai. This garment has an electric circuit that can generate 3800kv of current which can help the victim to escape. In case of multiple attacks it can send upto 82 electric shocks. Since the fabric is bilayer, the user is not affected. It can also send emergency messages. 3. ILA security: The co-founders of this system, McGivern, James Phillips, and Neil Munn, have designed three personal alarms that can shock and disorient potential attackers and draw attention to dangerous situations. International Journal of Engineering and Advanced Technology (IJEAT) published a paper about An Intelligent Security System for Violence against Women in public places. The intelligent security system for women mainly consists of three cameras and a processor. The system has following features: 1) Human Object Detection - Camera 1 is used to detect human object in a particular region 2) Male-female Detection - Camera 2 is used to detect how many males and females are present in a particular region 3) Facial expression recognition -Camera 3 is used to identify the facial expression recognition. Mainly three expressions are includes smile, fear, and anger. 4) GSM module and alarm system - If a female's facial expression like fear or anger is detected by camera 3, an alert message is sent to the control room using a GSM module and an alarm get activated.

1) BLOCKDIAGRAM

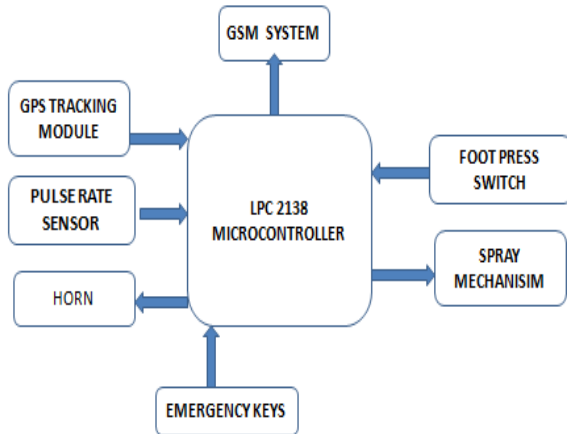


Fig. 1: Existing system

B. Proposal System:

Blood pressure sensor is mounted on the wrist watch of the girls which measures the blood pressure and heart rate of the women, this value is then fed into Arduino controller and it determines the normal and abnormal condition. 2) Temperature sensor present in the wrist watch measures the temperature rate of women 3) Location of women can be tracked by using the GPS system present in the women mobile phone with call used in GSM devices. The status of women in India has gone through many great changes over the past few millennia. From equal status with men in ancient times through the low points of the medieval period to the promotion of equal rights by many reformers, the history of women in India has been eventful. In modern India, women have adorned high offices in India including that of the President, Prime Minister, Leader of the Opposition and Speaker of the Lok Sabha. However, women in India continue to face social challenges and are often victims of abuse and violent crimes and, according to a global poll conducted by Thomson Reuters, India is the “fourth most dangerous country” in the world for women, and the worst country for women among the G20 countries. To design a portable device which resembles a normal belt. It consists of Arduino Board, GSM/GPS modules, screaming alarm and pressure sensors. When the threshold of the pressure sensor crosses, the device will get activated automatically. Immediately the location of the victim will be tracked with the help of GPS and emergency messages will be sent to three contacts and one to police control room every two minutes with updated location. The screaming alarm unit will be activated and will send out sirens to call out for help. The system is also capable to generate an electric shock to harm the attacker which may help the victim. The system architecture is classified into vehicle unit, emergency button, company unit, android device and technical unit. Vehicle unit consist the vehicle, Teltonika FM 1100 device and one android device for each vehicle[5]. The company vehicle picks up the employees and drops the employees. Emergency button is a part of vehicle unit..The data received from the device is interpreted, processed and used by the technical system. The co-ordinates and the vehicle location is displayed using the Google maps interface[10]. The system architecture is shown in Fig.2. The system is divided into several parts. The vehicle unit, company unit, Teltonika GPS tracking device are the key features of the system.

1) BLOCK DIAGRAM:

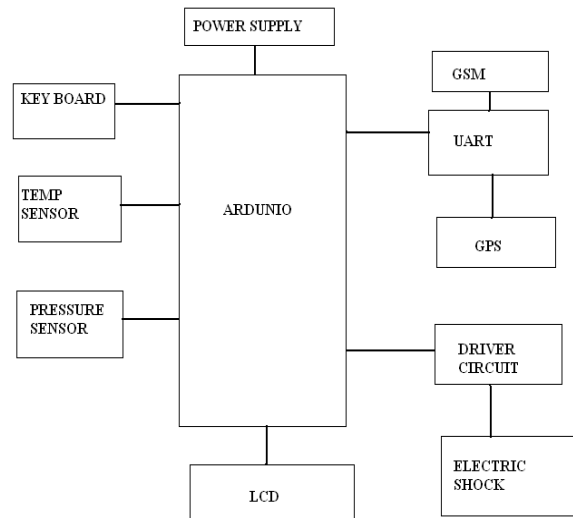


Fig. 2: Proposed system

2) Operation:

Whenever women feel unsafe or present in a critical situation the button present in the wrist watch must be pressed such that it measures the blood pressure, heart rate and temperature level of the girls. The wrist watch system continuously measures the BP for 15 minutes and is passed to mobile. A specific sms is send in girl’s android mobile and intern person’s mobile .Intern person’s number is fed in the controller so that it sends the message to them in case of emergency. The blood pressure below the normal range is determined as low blood pressure and above normal range is high blood pressure by the Arduino controller as the values are already fed in the controller. Low BP leads to fainting of girls, hence a message is sent to the nearby hospital. High BP is caused due to fear of girl hence a message is sent to the nearby police station by the GPS system present in mobile. The location of the girls can also be tracked by the GPS system present in the mobile and provide an immediate emergency system to them. The use of Blood pressure sensor and heat beat sensor resulted in higher accuracy and in case of detection of abnormal value the message is sent to all the intern person at a time. The link sent to the intern person helps in identifying the location of women. Blood pressure values systolic 120 , diastolic 90 ,Heart beat 100 are considered abnormal.

C. Power Supply Source:

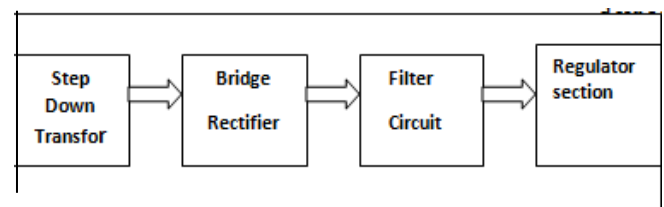


Fig. 3: Power supply source

A power supply is a device that supplies electric power to an electrical load. The term is most commonly applied to electric power converters that convert one form of electrical energy to another, though it may also refer to devices that convert another form of energy (mechanical, chemical, solar) to electrical energy. A regulated power supply is one that controls the output voltage or current to a

specific value; the controlled value is held nearly constant despite variations in either load current or the voltage supplied by the power supply's energy source.

D. Temperature Sensor:

A temperature sensor is a device that gathers data concerning the temperature from a source and converts it to a form that can be understood either by an observer or another device. These sensors come in many different forms and are used for a wide variety of purposes, from simple home use to extremely accurate and precise scientific use. They play a very important role almost everywhere that they are applied; knowing the temperature helps people to pick their clothing before a walk outside just as it helps chemists to understand the data collected from a complex chemical reaction.

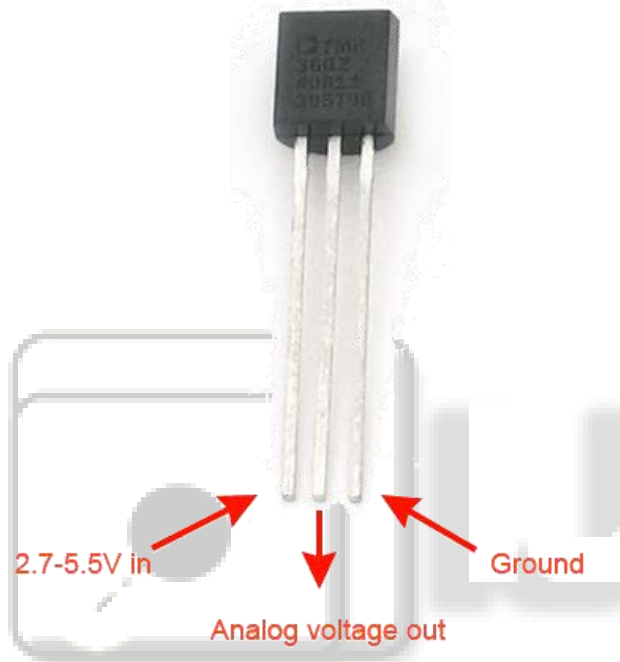


Fig. 4: Temperatures sensor

Temperature range: -40 degrees C to 150 degrees C / -40 degrees F to 302 degrees F
Output range: 0.1V (-40 degrees C) to 2.0V (150 degrees C) but accuracy decreases after 125 degrees C
Power supply: 2.7V to 5.5V only, 0.05 mA current draw.

E. Pressure Sensor:

A pressure sensor measures pressure, typically of gases or liquids. Pressure is an expression of the force required to stop a fluid from expanding, and is usually stated in terms of force per unit area. A pressure sensor usually acts as a transducer; it generates a signal as a function of the pressure imposed. For the purposes of this article, such a signal is electrical.

Pressure sensors are used for control and monitoring in thousands of everyday applications. Pressure sensors can also be used to indirectly measure other variables such as fluid/gas flow, speed, water level, and altitude. Pressure sensors can alternatively be called **pressure transducers**

F. Arduino:

An Arduino board historically consists of an Atmel 8-, 16- or 32-bit AVR microcontroller (although since 2015 other

makers' microcontrollers have been used) with complementary components that facilitate programming and incorporation into other circuits. An important aspect of the Arduino is its standard connectors, which lets users connect the CPU board to a variety of interchangeable add-on modules known as shields.

Prior to 2015 Official Arduino had used the AtMel megaAVR series of chips, specifically the ATmega8, ATmega168, ATmega328, ATmega1280, and ATmega2560 and in 2015 units by other manufacturers were added. A handful of other processors have also been used by Arduino compatibles. Most boards include a 5 V linear regulator and a 16 MHz crystal oscillator (or ceramic resonator in some variants), although some designs such as the LilyPad run at 8 MHz and dispense with the onboard voltage regulator due to specific form-factor restrictions.



Fig. 5: Arduino board

G. Digital Pins:

In addition to the specific functions listed below, the digital pins on an Arduino board can be used for general purpose input and output via the `pinMode()`, `digitalRead()`, and `digitalWrite()` commands. Each pin has an internal pull-up resistor which can be turned on and off using `digitalWrite()` (w/ a value of HIGH or LOW, respectively) when the pin is configured as an input. The maximum current per pin is 40 mA.

H. Analog Pins:

In addition to the specific functions listed below, the analog input pins support 10-bit analog-to-digital conversion (ADC) using the `analogRead()` function. Most of the analog inputs can also be used as digital pins: analog input 0 as digital pin 14 through analog input 5 as digital pin 19. Analog inputs 6 and 7 (present on the Mini and BT) cannot be used as digital pins.

I. Power Pins:

VIN (sometimes labelled "9V"). 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.

J. Other Pins:

AREF: Reference voltage for the analog inputs. Used with `analogReference()`.

RESET: (Diecimila-only) Bring this line LOW to reset the microcontroller. Typically used to add a reset button to shields which block the one on the board.

K. Driver Circuit:

ULN2803 is a High voltage, high current Transistor Array IC used especially with Microcontrollers where we need to drive high power loads. This IC consists of a eight NPN Darlington connected transistors with common Clamp diodes for switching the loads connected to the output. This IC is widely used to drive high loads such Lamps, relays, motors etc. It is usually rated at 50v/500mA. This article brings out the working of ULN2803 IC and how to use it in a circuit.

L. Uln2803:

Most of the Chips operates with low level signals such as TTL, CMOS, PMOS, NMOS which operates at the range of (0-5)v and are incapable to drive high power inductive loads. However this chip takes low level input signals (TTL) and use that to switch/turn off the higher voltage loads that is connected to the output side

M. Global Positioning System:

The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil and commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPS receiver. The GPS project was developed in 1973 to overcome the limitations of previous navigation systems, integrating ideas from several predecessors, including a number of classified engineering design studies from the 1960s. GPS was created and realized by the U.S. Department of Defense (DoD) and was originally run with 24 satellites. It became fully operational in 1995.

Block Diagram:

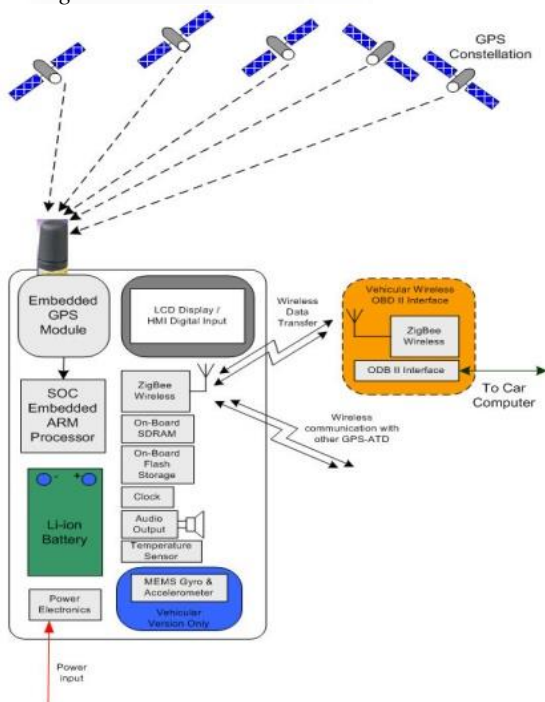


Fig 6: GPS block diagram

N. Gsm:

GSM (Global System for Mobile Communications, originally *Group Spécial Mobile*), is a standard developed by the European Telecommunications (ETSI) to describe protocols for second generation (2G) digital cellular networks used by mobile phones. It became the de facto global standard for mobile communications with over 80% market share.

The GSM standard was developed as a replacement for first generation (1G) analog cellular networks, and originally described a digital, circuit-switched network optimized for full duplex voice telephony. This was expanded over time to include data communications, first by circuit-switched transport, then packet data transport via GPRS (General Packet Radio Services) and EDGE (Enhanced Data rates for GSM Evolution or EGPRS).

Operation of Gsm:

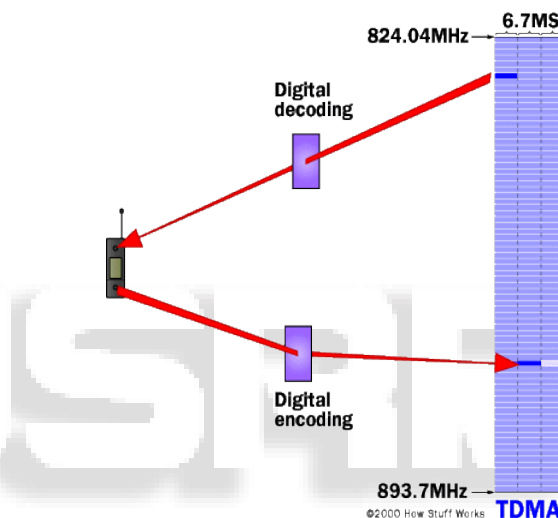


Fig. 7: GSM operation

Probably the most useful thing to know about the Global System for Mobile communications (GSM) is that it is an international standard. If you travel in Europe and many other parts of the world, GSM is the only type of cellular service available. Originally, the acronym GSM stood for Groupe Spécial Mobile, a group formed by the Conference of European Posts and Telegraphs (CEPT) in 1982 to research the merits of a European standard for mobile telecommunications. Commercial service using the GSM system did not actually start until 1991. Instead of using analog service, GSM was developed as a digital system using TDMA technology.

TDMA is the access method used by GSM, as well as the Electronics Industry Alliance and the Telecommunications Industry Association for Interim Standard 54 (IS-54) and Interim Standard 136 (IS-136). GSM implements TDMA in a somewhat different and incompatible way from IS-136. Think of GSM and IS-136 as two different operating systems that work on the same processor, like Windows and Linux both working on an Intel Pentium III. GSM operates in the 900 MHz band (890 MHz - 960 MHz) in Europe and Asia and in the 1900 MHz (sometimes referred to as 1.9 GHz) band in the United States. It is used in digital cellular and PCS-based systems. GSM is also the basis

for Integrated Digital Enhanced Network (iDEN), a popular system introduced by Motorola and used by Nextel. The incredible growth of GSM is a big part of why the acronym is now commonly thought of as standing for the Global System for Mobile communications!

II. CONCLUSION

Thus, the blood pressure, Heart beat and temperature is measured from the wrist watch which will be provided to women. Conscious level of women is identified with the help of location of women can be tracked by the GPS system, by this we protect the women from danger and give security to them in all situation and unnecessary problems can be avoided with the help of police and immediate aid will be given by nearby hospital. With some modification the size of the wrist watch can be minimized and make it user friendly. And the sensors can be inbuilt in the chain, ankles of the women which will be unknown to others. The proposed design will deal with critical issues faced by women in the near past and will help to solve them with technologically sound equipments and ideas. This system can overcome the fear that scares every woman in the country about her safety and security.

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