ANTI-KIDNAPPING SYSTEM FOR WOMEN WITH SECURITY ALERT

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ABSTRACT

The capital city has become really unsafe for women now a day. Almost every day we hear the news of many mishaps happening with women. Apart from security measures nowadays taken by Government, somewhere we feel that more smart/ intelligent system is required. As engineering students we have thought about a SECURITY SYSTEM that provides a sense of security to women. This paper describes about an intelligent security system for women. In case of any harassment, the women the uses the security kit that consists of four ways (voice board, button, two sensors) to protect them. In any critical situation, by pressing the button or by saying the password, the microcontroller in this kit is activated and it sends the message to the predefined numbers in the program. In conscious state, the above two ways are helpful to protect them. In case of unconscious state (i.e., kidnapper sprayed the chloroform) the women fell down, at that time, the accelerometer sensor sense the changes in the body position. Then, the sensor activates the microcontroller and it sends the message to the predefined numbers. In addition to that, the heart beat sensor is also available. If the heart beat rate changes from the normal level, the sensor sensed and activates the microcontroller which done the same work. We really believe that this endeavor will make a difference in the life of many in this world with individuals walking fearlessly.

KEYWORDS: Button, GSM module, Microcontroller, Sensor, Voice recognition.

1. INTRODUCTION

Women all the world are facing much unethical physical harassment. Women and girls experience and fear various types of sexual violence in public spaces, from sexual harassment to sexual assault including rape and femicide. In India, every day more than 92 women were raped and many are suffering austere mental and physical trauma. Even in the 21-st century where the technology is rapidly growing and new gadgets were developed but still women's and girls are facing problems. 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 [1] 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.

Even today in India, women can't move at night in secluded places and even at day time crowded places hundreds and thousands of incidents of physical/sexual abuse happens to every day women in this country. Among other crimes, rape is the fastest growing crime in the country today. From the year 2011 to 2012 the number of cases registered increased by 3%. But from 2012 to 2013 the number of cases saw a big jump of increase by 35%.A total 28,51,563 incidence of crimes were reported in 2014 which shows 7.7 per cent increase from the 2013 figure of 26,47,722. In rape cases, a total of 48,193 people were arrested last year which shows a 14.4 per cent increase from the 2013 report. There is a significant increase in number of persons arrested for auto theft with the arrest of 79,680 people which shows 37.7 per cent increase from 2013. The fig.1 shows the insecurity of the women and moreover sexual violence occupies the second position [2].
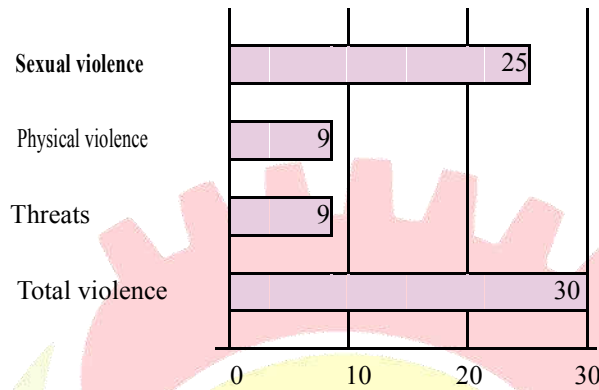
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Fig.1 Representation of women's insecurity.

2. EXISTING WORK

The existing systems for women security systems are based on face recognition [3]. In face recognition, the message can be sent to police or some predefined numbers depends on facial expressions. There is a drawback in the face recognition is that the message can be sent wrongly even though we are not in trouble. For example, in the bus stop we get tensed due to the delay of the bus arrival. Due to that wrong message, the relatives get stressed and police waste their time by investigating this case.

3. PROPOSED METHODOLOGY

3.1 SYSTEM OVERVIEW
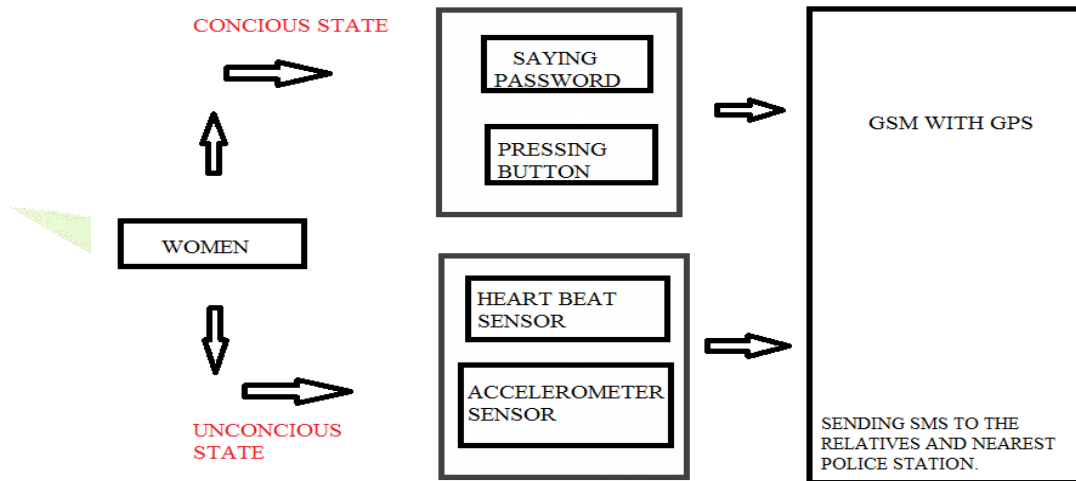
The following block diagram shows the system overview:

Fig.2 System Overview

3.2 SYSTEM ARCHITECTURE

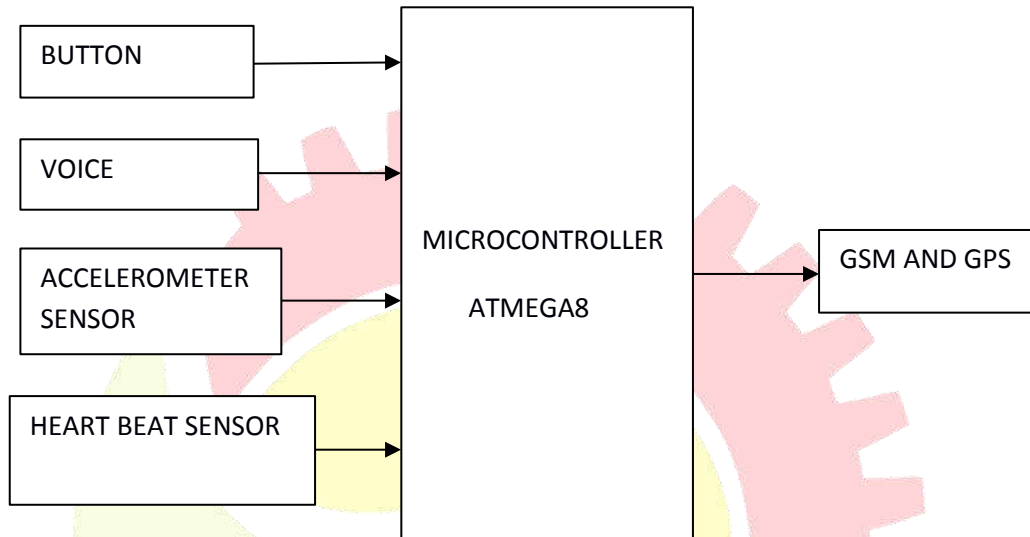The below block diagram shows the system architecture:

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Fig.3 System Architecture

3.2.1. MICROCONTROLLER

The **AVR** is a8-bitRISC single-chip microcontroller, which was developed by Atmel in 1996. The AVR was one of the first microcontroller families to use on-chip flash memory for program storage. TheAtmega8 has 23 I/O ports which are organized into 3 groups:

- Port B (PB0 to PB7)
- Port C (PC0 to PC6)
- Port D (PD0 to PD7)

B port is used as a serial communication port, C port is used as analog to digital converter and D port is used as external timer and counter. The ATMEGA8 has some special features: they are high performance, low power Atmel AVR 8-bit microcontroller, high endurance non-volatile memory segments.
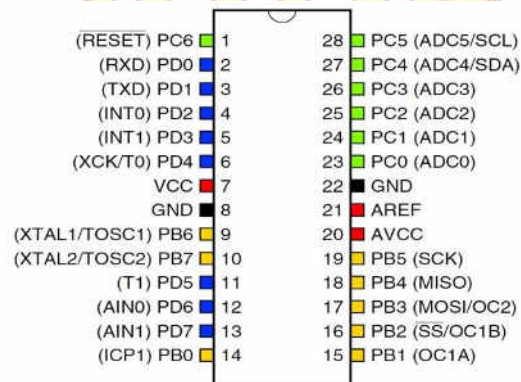

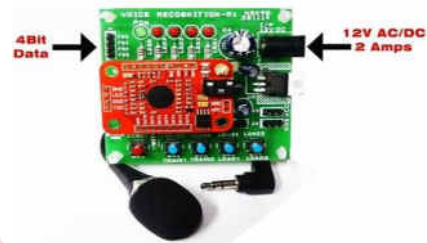
Fig.4 Pin Configuration

3.2.2. VOICE BOARD

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Fig.5 Voice board

Speech is the natural form of communication. And the speech produced by every person is unique. By incorporating this unique property of speech we can design a security system. In the voice board, 14 different voices can be stored in 4 bit pattern (like 0001, 0010,…) and it is a speaker dependent. It mainly consists of microphone and microcontroller which act as the center of the system and digital filter. The microphone circuitry is used to take the voice input from password holder or authorized personnel. The sampled and digitized voice signal is then given as input to the microcontroller. Inside microcontroller the signal is passed through the digital filters implemented as the function or routine [4]. Then by using various mathematical tools like Euclidean distance, Regression and correlation we will compare the input samples of voice signal with the predefined dictionary words. By doing this we will be able to recognize whether the input voice signal is the required voice password or not. If the voice is matched it activates the microcontroller and the message will sent to the desired persons through the GSM.

3.2.3. HEART BEAT SENSOR

The Heart Beat Sensor provides a simple way to study the heart's function. This sensor monitors the flow of blood through finger. As the heart forces blood through the blood vessels in the Finger, the amount of blood in the Finger changes with time. The sensor shines a light lobe (small High Bright LED) through the ear and measures the light that is transmitted to LDR . The signal is amplified, inverted and filtered, in the Circuit.

3.2.4. ACCELEROMETER SENSOR

The ADXL335 is a triple axis MEMS accelerometer with extremely low noise and power consumption - only 320uA.Board comes fully assembled and tested with external components installed. The included 0.1uF capacitors set the bandwidth of each axis to 50Hz and onboard regulator 3.3volts3 Axis Acceleration Sensor Board based on ADXL3XX from Analog devices. It is a first generation 3 axis acceleration sensor. User could get acceleration value of X, Y, and Z axis. And it is widely used in shock, slope, and moving detection. The output sensitivity could be select by simply set voltage level on few pins. The output is analog mode, so A/D converter to read the acceleration value is needed, but in port c of the atmega8 is analog to digital converter so that we didn't require A/D converter separately. The fig.6 shows basic principle of accelerometer sensor. The sensor is made of spring loaded, micro machined structure, mounted on silicon base. Force on the structure changes the position of seismic mass attached on the spring. This deflection is measured using fixed plate capacitor sensors. The change in acceleration unbalances capacitor plate distance, observed by modulation/demodulation circuits and thus, resulted in output proportional to acceleration. The sensing can be static (gravity) or dynamic (forced acceleration)[5].
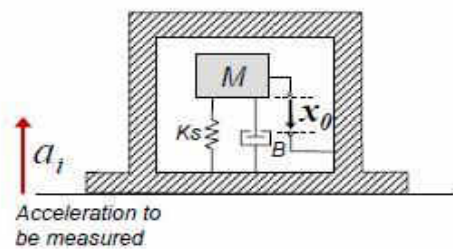
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Fig.6 Principle of accelerometer
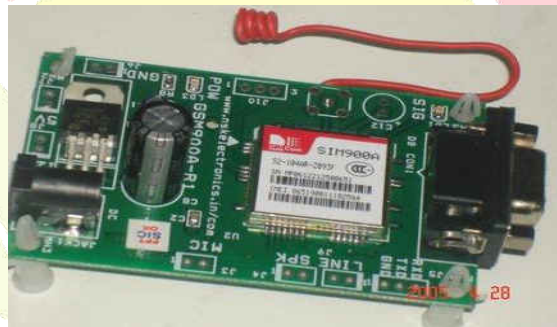
3.2.6. GSM/GPS

Fig.7 GSM/GPS

GSM/GPRS Modem is built with Dual Band GSM/GPRS engine- SIM900A, works on frequencies 900/ 1800MHz[6].The Modem is coming with RS232 interface, which allows you to connect microcontroller with RS232 Chip (MAX232). The baud rate is configurable from 9600-115200 through AT command. The GSM/GPRS Modem is having internal TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for SMS, Voice as well as DATA transfer. The onboard Regulated Power supply allows you to connect wide range unregulated power supply. Using this modem, you can make audio calls, SMS, Read SMS; attend the incoming calls and internet etc[7].

The MODEM needs **AT commands**, for interacting with processor or controller, which are communicated through serial communication. These commands are sent by the controller/processor. AT Commands are broadly differentiated in two categories as below[8]:
1. Basic Commands
2. Extended Commands

Basic Commands are those commands that do not start with '+'. For Example, ATD Note (For Dial), ATA Note (For Answer).Extended Commands are those commands that starts with '+'. For Example, AT+CMGS Note (For Send SMS). All GSM AT Commands are Extended Commands.

5. RESULTS AND DISCUSSION

The system was implemented by first designing the hardware and later the software. It was rigorously tested for its proper operation and reliability. Hardware design began by designing individual circuits and

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their testing. Suitable modifications were carried out at various stages as necessary. After the confirmation of the proper operation of each circuitry, the Printed Circuit Board (PCB) was designed. The circuit was rigorously tested once again after mounting of all components on the PCB. Voltage levels and signals were checked for their correctness at various stages. Some minor modifications were carried out as needed.

Software design was started after the hardware was fully fabricated and tested successfully. Programs were written in Embedded C language and the program is compiled successfully by using Code Vision AVR and tested successfully. After the program was dumped the system undergoes into checking process and the system functioned as expected and the desired results were produced.

7. CONCLUSION

This paper reviewed the emergency response system which is helpful for women in the incidents of crime. The key objective is to develop a low cost system which can store the mobile number and provide immediate alert in case of crime against women. Being safe and secure is the demand of the day. Our effort behind this project is to design and fabricate a gadget which is so compact in itself that provide advantage of personal security system. This device will probably be very useful for the women. It is certainly a short term and preventive solution. This system will help its users in difficult situation. This system would be highly sensitive and easy to handle. Its quick action response will provide safety and security to individual user.

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9. ACKNOWLEDGEMENT