Android Based Women Safety Application with Blood Pressure, Heart Beat Monitoring and Location Tracking, Emergency Support System

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Abstract— In recent years, the concepts and techniques relating to women's safety has got a greater impact to the society. Girls are assaulted in many cities and villages so the insecurity issues act as a major crisis. This system is mainly involved in protecting women from physical and mental harms. The strap with sensors in it, is wrapped around the women's hand like a wrist watch. The sensors will sense the Blood pressure (BP), heart rate and temperature of women. If any abnormality arises the information is transferred to the respective receiver as an alert message from the server. The server will forward the message to the intern person and it will send alert to the hospital when the pulse rate is decreased and to the nearest police station when the pulse rate is increased. The intern person will be provided with the specific android application to access the server. The intern person's mobile number will be stored in the server specifically.

Key words: Girls safety, Android Application, Blood Pressure, Heart Beat, Location Tracking, Emergency Support

I. INTRODUCTION

The android application is used to track the location of the affected women. The sensor is used to monitor the pulse rate, heart beat and temperature of the girls. If the range of these parameters is changed from the normal condition for more than 15 minutes, it will send a request to the server. The server will send an emergency alert to the intern persons through GSM modem [1]. Also it will send an alert to the nearest hospital if the range of these parameters is decreased from normal range and it will send an alert to the nearest police station if the range of these parameters is increased from normal range. Then the intern person will track the location of the women using GPS and they will take the remedial action for the affected girls. The mobile numbers of the intern person will be stored in the database [2]. Each intern person will be provided with the authentication. Using that authentication they will access the corresponding application.

II. EXISTING METHOD

International Journal of Engineering and Advanced Technology (IJEAT) published a paper about An Intelligent Security System for Violence against Women in public places [3]. The intelligent security system for women mainly consists of three cameras and a processor [4] [5].

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].
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].

III. METHODOLOGY
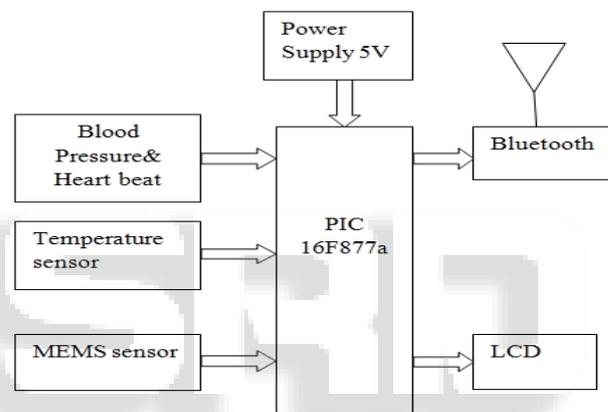
A. System Components:

Fig. 1: Block diagram

The system has the following features
- Measuring Blood Pressure and Heart Beat rate
- Measuring temperature rate
- Monitoring consciousness level
- Tracking the location

1) 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 PIC controller and it determines the normal and abnormal condition [6].
2) Temperature sensor present in the wrist watch measures the temperature rate of women
3) MEMS sensor measures the change in movement of girls and determines whether the women is fainted or remains conscious
4) Location of women can be tracked by using the GPS system present in the women mobile phone [7].

IV. SYSTEM WORKING PRINCIPLE

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 by Bluetooth present in it .A specific android

application is installed 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 PIC 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 [7] [8].

A. Blood Pressure & Heart Beat Sensor:

SUNROM Blood pressure sensor model no 4118 is used and the sensor consist of piezoelectric crystals which picks the mechanical vibration from the body and it convert the vibration into electrical signal. The sensor working voltage is +5V, 200mA regulation. The output format is serial data at 9600 baud rate. Sensing unit wire length is 2m [9]. Heart beat is sensed and displayed in LCD.

B. Temperature Sensor:

LM35 is a precision IC temperature sensor. The output voltage of this sensor is linear relationship between the Celsius temperature scale of 0°C. For every 1°C increases in output voltage of 10mV.

C. MEMS Sensor:

Micro-Electro-Mechanical Systems or MEMS, it is mainly to define position and orientation of some object or person. Determining position and orientation in a real world requires accurate measurement and tracking. It measure rotations about three axes (x, y, z).

V. EXPERIMENTAL RESULTS

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 <90 and >120 , diastolic <60 and >90 ,Heart beat <60 and >100 are considered abnormal.

Fig. 2: Temperature and Blood Pressure value

Fig. 3: Heart Beat and Position Detection

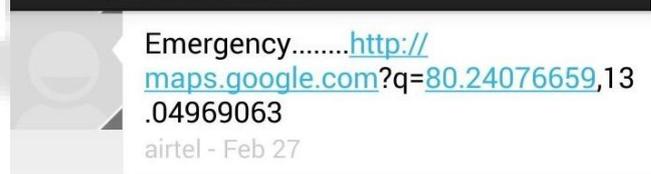Fig. 4: Heart Beat and Abnormal Position Detection

Fig. 5: Alert message to intern person

VI. 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 MEMS sensor and 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.

VII. FUTURE SCOPE

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.

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