



IOT Based Approach for Women Security Using GSM and GPS

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Abstract: In modern India still women continue to face many social challenges and are victims of violent crimes. The project focusses on providing security to women by developing a smart device which are comfortable for them to use. A modern device connected with the smart phone reduces the expense of this project. The proposed design will deal with critical issues faced by women in the near past and will help to solve them with technologically sound equipment and ideas. This system can overcome the fear that scares every woman in the country about her safety and security. The proposed device is a safety system in case of emergency. The main purpose of this device is to intimate the parents and police about the current location of the women. A GPS system is used to trace the current position of the victim and a GSM modem is used to send the message to the pre-defined numbers.

Keywords: Microcontroller, GPS, GSM, GPRS

I. INTRODUCTION

The world can grow at a higher rate only when women are free from all kinds of violence. Even after the freedom still Women are not given freedom so only when women are respected and given freedom then only we can call our nation as a democratic world. Women can help the society in various ways. Still in the modern era, women have to face many more problems and struggle a lot to establish a safe environment. Every day and every minute some women of all walks of life (a mother, a sister, a wife, young girls, and girl baby children) are getting harassed, molested, assaulted, and violated at various places all over the world. Streets, public spaces, public transport, etc have been the territory of women hunters. The most common crimes done against women are rape, dowry deaths, sexual harassment at home or work place, kidnapping and abduction, cruelty by husband, relatives, assault on a woman, and sex trafficking. Women are getting affected by the various violence almost every day which is disrupting the society. Women is getting kidnapped at every 44 minutes, raped at every 47 minutes, 17 dowry deaths every day. The most important milestones on the international level for the prevention of violence against women include: The 1979 Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), which recognizes violence as a part of discrimination against women. The 1993 World Conference on Human Rights, which recognized violence against women as a human rights violation. In 2004, the World Health Organization published its "Multi-country study on Women's Health and Domestic Violence against Women", a study of

women's health and domestic violence by surveying over 24,000 women in 10 countries from all regions of the world, which assessed the prevalence and extent of violence against women, particularly violence by intimate partners, and linked this with health outcomes to women as well as documenting strategies and services that women use to cope with intimate-partner violence. Also in 2013, the UN General Assembly passed its first resolution calling for the protection of defenders of women's human rights. The resolution urges states to put in place gender-specific rules and regulations for the protection of women's human rights defenders and to ensure that defenders themselves are involved in the design and implementation of these measures and to ensure their unhindered access to and communication with international human rights bodies and mechanisms. The proposed device is a safety system in case of emergency. The main purpose of this device is to intimate the parents and police about the current location of the women. A GPS system is used to trace the current position of the victim and a GSM modem is used to send the message to the pre-defined numbers. There are several applications that reduce the risk of sexual abuse by sending SMS but in our model we also provide an audio circuit which is more useful for physically challenged people. When the device is started, it tells people whether the area they are entering is safe or not to make them aware of the place. When the help button is pressed the device is activated within a fraction of seconds. Immediately the location of the victim is tracked and messages are sent to



emergency contacts and they get a voice messages telling them the location details and directions of the nearby police so that they can escape and run quickly from danger. The block diagram of the proposed system . The IoT device acts as an embedded computing system and it controls the activities of all the subsystems. There is an IoT board based on Arduino Leonardo with GSM/GPRS/GPS. It is developed for multi-purpose applications. Cloud is used to store the criminal details and details of the person in trouble. A cloud is a collection of network-accessible computing resources. To a user, a cloud represents the abstraction of a computing infrastructure consisting of a hardware and software resources that user can access over a network. Cloud services are primarily monitored for configuration ,availability , capacity , performance and security. A cloud service is any combination of computing resources , such as hardware resources, platform software and application software. [5] discussed about an eye blinking sensor. Nowadays heart attack patients are increasing day by day. "Though it is tough to save the heart attack patients, we can increase the statistics of saving the life of patients & the life of others whom they are responsible for. The main design of this project is to track the heart attack of patients who are suffering from any attacks during driving and send them a medical need & thereby to stop the vehicle to ensure that the persons along them are safe from accident. Here, an eye blinking sensor is used to sense the blinking of the eye. spO2 sensor checks the

pulse rate of the patient. Both are connected to micro controller. If eye blinking gets stopped then the signal is sent to the controller to make an alarm through the buffer. If spO2 sensor senses a variation in pulse or low oxygen content in blood, it may results in heart failure and therefore the controller stops the motor of the vehicle. Then Tarang F4 transmitter is used to send the vehicle number & the mobile number of the patient to a nearest medical station within 25 km for medical aid. The pulse rate monitored via LCD .The Tarang F4 receiver receives the signal and passes through controller and the number gets displayed in the LCD screen and an alarm is produced through a buzzer as soon the signal is received.

STATES WITH THE WORST RATES, NUMBERS OF INCIDENTS

State	Incidents	Per 1 lakh female population
Delhi	2,199	23.7
Chhattisgarh	1,560	12.2
Madhya Pradesh	4,391	11.9
Odisha	2,251	10.8
Rajasthan	3,644	10.5
Maharashtra	4,144	7.3
UTTAR PRADESH*	3,025	3.0

*Surprisingly low rate suggests widespread non-registration of rape cases

OVERALL CRIME AGAINST WOMEN

Delhi tops rate chart, UP has biggest national share

State	Cases	Per 1 lakh female population	%age contribution to all-India total
1 Delhi	17,104	184.3	52
2 Assam	23,258	148.2	71
3 Telangana	15,135	83.1	4.6
4 Odisha	17,144	81.9	52
5 Rajasthan	28,165	81.5	8.6
6 Haryana	9,446	75.7	2.9
7 West Bengal	33,218	73.4	10.1
8 Tripura*	1,267	68.2	0.4
9 Madhya Pradesh	24,135	65.5	7.4
10 Chandigarh*	463	64.8	0.1

*Fewer cases, but small populations raise the rate

II. LITERATURE REVIEW

A. GPS BASED DEVICES

Tracking in real time has been an interest for lots of research people and tracking plays an essential role in safety purposes. [20] Phuong describes a system based on the Global Positioning System (GPS) and Global System for Mobile Communication (GSM) that describes the model for tracking the location of the victim in a huge outdoor environment. There are many techniques that propose electronic tele monitoring systems that is used for tracking victims and aggressors in order to reduce situations that may cause danger. Though these approaches are based on locating and data transmission technologies such as GPS and GPRS. This module directly gets connected to the satellite through GPS when activated. [8] describes a portable system that sends a message to the mentioned phone number with the help of GPS and it continuously gives a call to the mentioned number until they see the message. The paper [19] describes the full implementation details of the GSM and the GPS module. The output is in the form of simulation and here a text sums is sent to the nearby police station. The Paper [6] proposed a portable device as a belt which activated based on the pressure differences over the threshold in a danger situation. A GPS module tracks the location and sends the emergency

notifications to three contacts every two minutes with updated location through GSM. The date, global time, longitude, latitude, altitude, speed, distance and travel direction among other data, are produced by this module and can be used in lots of applications including navigation, fleet management, tracking systems, mapping and robotics. The module supports more than 51 channels. The advanced development in the performance of the GPS, accuracy, integration, computing power and flexibility are enabled by the GPS. The embedded system integration process are simplified by GPS solution. The system starts alarm, to call out for help and also generates an electric shock to harm the attacker which may help the victim to escape. The device comprises of micro controller on the AT Mega328 board which programmed using the ARDUINO programming language. The paper describes a system in which a normal belt is used in which GPS is used for tracking the location of the person and location details are sent to three emergency contacts. This

paper focusses on the system which contain various modules such as GSM shield (SIM 900A), Arduino AT Mega328 board, GPS (GY-GPS6MV2), screaming alarm (APR 9600), a set of pressure sensors for activation and power supply unit. The paper [14] describes a system in which a sensor is present which detects the heartbeat that increases when the epinephrine hormone is secreted more and then it gets activated, then through GPS the location of the nearby police



station is found and call is done. The paper [9] describes a system in which smartphones are not used and in this a system which is based on one touch and then immediately an alert is sent using force sensor and GPS to wireless SOS key contacts and the police station. This provides a facility to protect women by using wireless GSM and GPS module. GPS will calculate the latitude and longitude and then GSM module will send a message to the contacts mentioned. The paper [3] describes a smart gadget which contains a button that when pressed gets connected to a satellite and location is transferred through GSM and it provides a new way to interact with the people, technology and the environment. The module is divided into three sections-Sensing module (Emergency key, voice recognition module), Control module (ATMEGA32, Microcontroller, Power supply unit), Transmission module (LCD module, GSM module, GPS module) [4] describes a system with GPS device i.e. Tectonic FM1100 that provides the location details and an alert is sent to the rescue team. It consists vehicle unit, emergency button, android device and technical unit, Google map is also used for location purposes. The emergency alert is also sent to the mail registered contacts. The android device provides reliability of the system. The computing resources that make up the cloud infrastructure are deployed in data centers A data center is a facility that houses centralized IT systems ,storage systems and network equipment.

B.SENSOR BASED DEVICES

The paper [18] describes a system in which an emergency message is sent to the registered contacts and a non-lethal shock is produced to injure the attacker and the microcontroller is interfaced with Emergency Switch, Analogy to Digital Converter (ADC), 3Axis MEMS Accelerometer, Pressure Sensor, Body Temperature Sensor, GPRS Receiver, GSM MODEM, Speech Circuit, High Voltage Shock Circuit. The paper [15] describes an Embedded board which is the major system that controls and connects the modules that contains a microcontroller and microcontroller related circuit which is use to run it and interface to it. 4x4 Keypad is used for getting the relatives/friend mobile no and they get updates of your current location, start of journey and end of journey notifications. Same keypad functions can be used for entering the destination location. [8] describes an application that captures the image of the person trying to misbehave and sends it to the SOS contacts and the system consists of the bus unit which tracks the path of the bus in case if the women in the bus is in danger. Visual object tracking plays an essential role in reaching the victim in case of emergency. The paper [10] Describes a system in which various sensors. A sensor is a device which detects changes in the surroundind environment. It is like a subsystem and is always used with other electronics. It detects and responds to the physical

environment. The environmental phenomena can be the input to the sensor such as pressure, temperature ,moisture etc. There are different types of sensors such as Temperature Sensor, IR Sensor ,Ultrasonic Sensor ,Touch Sensor ,Proximity Sensors, Pressure Sensor ,Level Sensors, Smoke and Gas Sensors.



Link aggregation is done that combines two or more parallel network links into a single link called port-channel, yielding higher bandwidth than a single link could provide. Link aggregation enables distribution of network traffic across the remaining links and the traffic failover in the event of a link failure. Multipathing can perform load balancing by distributing I/O across all active paths. The acidometer sensor and temperature sensor for detecting the motion of the user. Microcontroller will compare the readings with the threshold values provided .This threshold values vary from individual to individual. After comparing the calculated threshold values, Microcontroller will send "Help" message accordingly. The paper [2] describes a system in which live video streaming process the situation of the person who is in danger and captures the face of the attacker along with the surrounding environment and also tear gas is used to provide immediate security to the person in crisis. [1] The report of WHO tells that, "A violence act against female disturbed the public life of the society and also it violates the human rights of women. The violence against women can be decreased only if there is change in the people mind. This can be done only by their parents ,they have to teach their children to respect the women so that when they grow old they will know the value of women and respect them. Not only the women is affected by the violence done against her, even the society also undergoes the problems because of that violence. The society must change its thoughts against women only then various crime against women can be reduced. So severe punishments should be given and they should also be sentenced to death."



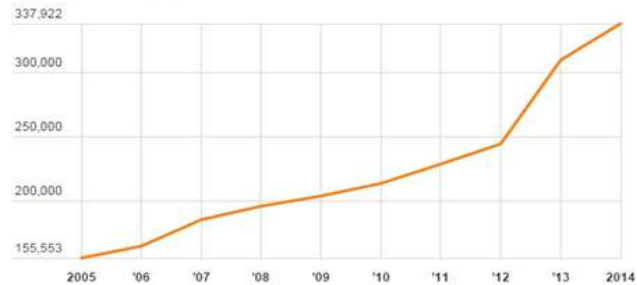
PROTECT WOMEN RESPECT WOMEN “ should be taught by the parents to their children.

S NO	PAPER	AUTHOR NAME	COMPONENT	LIMITATIONS
1	Design and Development of Women Self Defense Smart Watch Prototype[3]	Ahiva Kumar.H.K, Kalpavi.C.V, Shreya R.S, Varun.B.C	ATMEGA32, Microcontroller	It is not cost efficient and is easily damageable.
2	Smart girls security system[5]	Archana Naik ,Prof. Basavaraj Chougula, Monika Monu, Priya Patil and Priyanka Das	(SIM 900A), Arduino ATmega328 board, GPS (GY-GPS6MV2)	The location details are not sent to the police stations and they are unaware of the condition of the victim.
3	IOT Based Unified Approach for Women and Children Security Using Wireless and GPS[10]	Mr. Atul S.Bhawale , Ms. Deepali M. Bhavale, Ms. Priyanka S. Bhawale, Ms. Tejal Sasane	Microcontroller ,Heartbeat sensor, Acidometer sensor and Temperature sensor	The heart beat sensor used can malfunction sometimes because heart beat can raise even when are playing.
4	SCTWARS Android Application for Women Safety[12]	Dipika Nikam, Kanchan Jadhav , Neha Pathak ,Vaijayanti Pawar, Prof. N.R.Wankhade	SCTWARSapp (Spy Camera Identification and Women Attack Rescue System)	Cameras can be damaged by the attacker and only a blur image of the attacker is obtained.
5	I-PROB – Emergency application for women[16]	Magesh kumar.S and Raj kumar.M	I-PROB	Fake alerts are made and police are unable to distinguish between the original and the fake alerts.

limitations of the system

Crimes Against Women, 2005-2014

*Figures represent cases reported.



C.ANDROID APPLICATIONS

The paper [17] proposes the women security device called as “Suraksha” which is a device that can be easily accessed. This device can be started through-voice command, single click a switch key and shock (i.e. when the device is thrown with force, a force sensor activates the device). In a crisis it will send the message including instant location to the police, via the transmitter module and registered numbers via a GSM module. It plays a vital role in the proposed system where all the police stations are connected and information about the criminal records, crime investigating cases etc are shared. The paper [13] describes a voice keyword recognizing app to identify the user and activate the app even when the keypad is locked. The GPS module tracks the longitude and latitude to find the exact location of a user and sends the emergency message that is restored including location details to the registered numbers in the mobile. The message are delivered in queue and if there is any problem in the network it waits and send when network gets available. A notification is generated for successful delivery of the message. [16] Proposes an app called as I-PROB to provide security to women by just tilting the mobile above the predefined threshold value and the system is activated. It starts capturing the voice in the surrounding environment and then test and confirm the danger I-PROB situation where a notification is raised and to the register contacts then appropriate emergency services like ambulance, fire brigade are alerted. If a registered contact responds with an audio, then it automatically connects and enables the speakerphone at the victim side.



The paper [11] Proposes an android app that consists of two modules. First module provides security to women by save our Souls app by a single click of SOS button and no need to unlock screen. The second module provides security to your belongings. This app informs about the intrusion provided by the attacker. The paper [12] proposes a SCIWARSapp (Spy Camera Identification and Women Attack Rescue System) which consist of two sections and provide a high security to women in any crisis. [19]The paper describes the full implementation details of the GSM and the GPS module. The output is in the form of simulation and here a text sums is sent to the nearby police station.

III.CONCLUSION

Despite of formation of various strict rules and regulations to handle and stop the crimes against women, the number and frequency of crimes against women are increasing every day. This system provides an effective way to prevent suspicious activities against women .This device provides security to women in any dangerous situations. Tracking devices are available nowadays but they are very expensive and they are not affordable so the final outcome produced is cost efficient and can be easily purchased by an individual. Anyone who misbehaves or doing any type of harmful activities against the women will be punished and it will reduce the crime rate against the women

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