EFFICIENT TRACKING FOR WOMEN SAFETY AND SECURITY USING IOT

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Abstract: Women play vital roles in our society from their birth to the end of life. In the past few years, crime against women has increased to a great extent. According to the survey it is found that 84 per cent of the women who experienced harassment were in the age group of 25 to 35 years, who are mostly full-time workers and students. Most of the women also don't concentrate on their health due to their busy schedule. Women safety and security is a serious and biggest social issue and most importantly hurting the half population of the country in all aspects which needs to be solved urgently. Since no one can respond aptly in critical situations, we propose a smart intelligent device which automatically senses information and helps women in "Every single step of life". The device is the integration of multiple devices comprises of a wearable smart-band and a secret webcam connected via Bluetooth which continuously tracks the information and communicates with smart phones that has access to the internet. The application is programmed and embedded in such a way that tracks information of the women such as call log, messages, movement, pulse measurement, blood oxygen levels, heart beat rating and records continuously in the internet. When SOS present in smart band is pressed continuously it automatically generates signals to the predefined smart phones and nearest police station along with location coordinates and the secret webcam in the locket captures the culprit photo which is directly uploaded to the server.

Keywords : Women play vital roles in our society from their birth to the end of life. In the past few years,

1. INTRODUCTION

Today, in the current global scenario, Women were facing lot of challenges. Even after playing her all the roles and all the job timely in efficient manner in the modern society, she is weak because men are still strongest gender of the society. In the last few years, crime against women in Delhi has increased to a great extent. Some of the most common crimes 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. According to the statistics, it is found that every two out of three women have suffered around two to five times sexual harassment in the last year.

By the survey of Delhi government's Women and Child Development Department, around 80% of the women in national capital have fear regarding their safety. Today girls were not allowed to move freely even in the streets due to security reasons. Day by day the women harassment is increasing. As of now we alone can't change the society totally but we can increase the security of women by using modern technology.

Nowadays though there are many apps and devices evolved for women safety via a smart phone which can be activated only by a touch or one click or shake the mobile. It is not possible to carry mobiles in our hand in all circumstances and it is not possible to make a call or click on it or shake it, so here we introduced a new technique via smart watches.

This paper describes about a smart and efficient intelligent security system for women which is the integration of multiple devices comprises of a wearable smart-band and locket connected via Bluetooth which continuously tracks the information and communicates with smart phones that has access to the internet. The application is programmed and embedded in such a way that tracks information and records continuously in the internet and when SOS present

in smart band is pressed it automatically generates signals to the predefined smart phones and nearest police station along with location coordinates. The locket comprises of webcam which captures the culprit photo and tracked in the internet. The system is integrated with a device which helps in tracking health information. It measures pulse and blood oxygen levels and monitors heart beat. It provides detailed information about frequency, duration, intensity, and patterns of movement to determine your steps taken, distance travelled, calories burned, and sleep quality. The 3-axis implementation allows the accelerometer to measure your motion in any way that you move. This device guides the women in maintaining her health during abnormal condition or pregnancy.

2. EXISTING SYSTEM

The existing systems surveyed are mentioned below:

a) System designed as apps for android smartphones

- In paper [1] the voice recognizing module will recognize the user and activates the app even if the mobile keypad is locked. The GPS in mobile will read the latitude and longitude to trace the exact location of the user and sends the alert message including the location to registered contact numbers. The audio recording module records the conversation for evidences. Also user can select contact number to make a call through voice based contact list.

- In paper[3] a single click in the mobile app it first make a call to the first registered contact number and sends the alert message to all the registered contact numbers along with the location continuously for every 5 minutes until the stop button is clicked in the application.

- VithU is a popular app for women safety which is activated when the user press the Power button present in smartphone twice. It sends an alert message to user's emergency contacts every two minutes.
- Raksha this app is activated when the button tapped, immediately sends the user's location to specified contacts. If the app is switched off or not working, when the user press volume button for three seconds it can send alerts using SOS functionality.
- Stay Secure app can be activated by pressing the Power button five times and automatically sends an alert to user's emergency contacts. It also has a free SOS SMS feature which can send a text to five of user's saved contacts within five minutes. Stay Secure also allows the user's saved contacts to keep a track of her location and can work without data connectivity.
- Shake2Safety app is activated when the user shake Smartphone or press the power button four times to send an SOS text or call to the pre-registered numbers. It works even when there's no internet connection.

b) System designed as devices

- In paper [2] the sensor in the watch gets activated when the targeted heart rate for the targeted time period is achieved and produces alarm sound to make the nearby people attention. It automatically calls the registered contacts and sends the user's location through message.
- In paper [4] when the user press the control button present in smart watch it immediately sends senses the voice command and sends it to the nearest police with the current location. It also contains a shock mechanism to produce electric shock in emergency situations to deter the attacker.

3. PROPOSED SYSTEM:

Base on the critical analysis and the requirement of safety functionality the modules are selected as shown in figure 1. The proposed system mainly consists of two wearable devices.
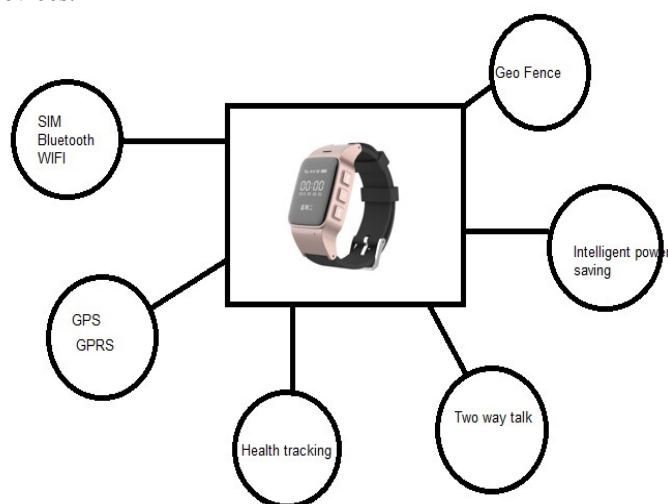

Figure 1: Image of smart tracking device

1. **Wrist watch tracking device**
   This system comprises of various features listed below.
   - Device with SIM enabled

- GPS,BLUETOOTH &WIFI
- Two way talk
- Long standby
- Intelligent power saving
- live tracking,
- Emergency call (another form of SOS)
- GSM 900/1800/1900 with GPR
- 45X35x13.5mm
- GEOFENCE

The smart watch is capable of storing few contact numbers. The up and down buttons on right side of the watch is used to select contact and make a call. It has capability to receive a call as well. There are two more buttons on the left side of the watch, one is SOS button and other is power-off button. The device is activated when SOS button is clicked for two seconds. It is programmed that when the device is activated, it immediately sends the alert messages like " I am in danger, please help me" with long beep sound with high volume at the receiver side even it is in silent profile along with location using GPRS.

The device is also embedded with live tracking chip which senses the pulse rate, heart beat, calories burnt and blood oxygen levels of the user. Normally the smart watch always keeps tracking the information of user like day to day call log (i .e out going and incoming call information), messages, movement (where the user is going specifically with time), blood oxygen levels, pulse measurement, heart beat rate, calories burnt for every one hour depends on the setting. The 3-axis implementation allows the accelerometer to measure the motion in any way that the user moves. All these information is stored in the server through internet. When the user is in abnormal condition, the device immediately notifies the registered contact numbers with the message "The user is in abnormal situation, please consult doctor immediately" along with location of the user.

The device also has a feature " GEO FENCE", which immediately alerts receiver (the registered contacts) when the user moves out of specified location with a message "Out of boundary, Please look over".

2) Device with Camera which can be used as locket
This device consists of the following features
- Bluetooth
- Camera with 0.3 Mega Pixel (spy camera)
- Rechargeable battery

- This device has two buttons one is power off and other is to activate. When the device gets activated the camera captures the attacker's picture and records in the server. These pictures will be used as the evidence.
- It detects the infrared rays coming from every hidden cameras placed in changing rooms, hotels room etc., in such cases it traces the location using GPS module and send the notification to the user about unsafe place. We can programme according to the user decisions to register the complaint base on notification.

4. METHODOLOGY OF PROPOSED MODEL

To make the proposed system work, both the smart watch and locket camera must be charged and turned on.The following steps must be done before the user using the system.

Step 1: Register contact numbers in the smart watch

Step 2: Set the time duration for tracking the information, so that for every mentioned time the information is updated in the server.

Step 3: Bluetooth must be enabled in both the devices(i.e watch and locket)
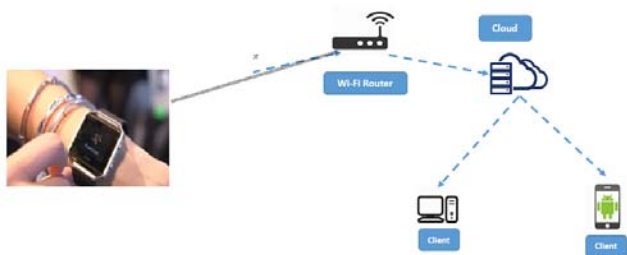
This System can be used in different levels for a women.

Figure 2: Overview of women safety and security system

a) **Working of safety device as Health Tracker**

If the user enables Health Tracker, the system tracks the pulse rate, heartbeat, calories burnt and blood oxygen levels of the women for every time duration depends on the setting of the user. This information will be stored in the server so that she or her family members who know the URL address can view the data. When the reading of either pulse or heart beat or calories burnt or blood oxygen levels are not in normal condition (exceeding or falling below the limit), immediately the system sends alert message "SHE IS IN ABNORMAL CONDITION, CONSULT DOCTOR" to the registered numbers with long beep sound at the receiver side.

This system will also help women to guide how much she have to walk. It informs the women to "walk" if she sit for long time and also if she walk (or jog) for more time it informs the number of calories burnt and suggest to "stop walk". This system helps the women to make herself fit and mainly during her pregnancy.

b) **Working of safety device as GeoFence**

The GPS in Smart watch tracks the movement of the women and is used to know the speed of movement with the help of rate of change in latitudes and longitudes. For every time duration depends on the setting the information is tracked and saved in the server. When the women moves out of the area (which can be specified) it immediately notifies with message to the registered numbers "SHE IS OUT OF BOUNDARY, TAKE CARE". Especially this GeoFence can be used in children (girls) so that when

the child (girl) moves out of specific area. This can be viewed at the URL as the information is stored in the server.

c) **Working of safety device when women in vulnerable attack.**

When the women face with any vulnerable attacks, the only thing she has to do is pressing SOS button for two seconds. Immediately the device gets activated and sends the alert messages like " I am in danger, please help me" with long beep sound with high volume at the receiver side even it is in silent profile, along with location using GPRS. This system works even in the absence of internet connectivity.

The hidden camera in the locket like device is also gets activated when SOS is clicked and captures the attacker's pictures. This information will be also gets stored in the server so that these pictures can be helpful for evidences.

5. CONCLUSION

This Efficient, Smart and Intelligent device really helps women in "Every single step of life". The women need not hold the device like smart phones. The only thing to do is enabling before they need. When the device gets activated it stores every information of women in the server and notifies the police and their family members (i.e registered numbers) when required.This system act as super fancy guard for women at anytime and anywhere when they wear. So that women can come out freely without any obstacles to reach their goals and future endeavours.

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