SMART SAFETY AND SECURITY SYSTEM FOR WOMEN

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Abstract: Now a day's women are facing difficulties to protect themselves. In our country even though there is an economic development, but still there are many crimes against women. In order to overcome these situations, a mobile based application system is developed that has all the information regarding available police stations and safety places where user can search nearby police stations and safety places. It also shows nearby hospitals, blood banks etc. When a women is in danger and in need of self-defence then she can spell a particular command which will activate the entire system, this immediately sends an alert to the concern persons and nearby police stations with location using GPS tracking.

Keywords— Trilateration algorithm

1. Introduction

Prototype is a user friendly mobile application where user can search nearby police stations and safety places to protect themselves. It also shows this hospitals, blood banks, and safety places like ATMs etc.

In India many women looking for safety from social issues like many harassments. Women didn't know how to protect themselves from these harassments and unable to find themselves from the police departments. So we have proposed a technology that helps for women with most technology. So we proposed a mobile application technology whenever the women spell the panic command then the alert will be send to the nearby police departments and concern family members automatically. The alert will be send as in the form of SMS including particular location by using GPS tracking. The department will take immediate actions on the attackers.

1. Existing system

In existing system we have lot of acts and applications which also contains nearby police station numbers and emergency contacts. This existing system contains one panic button. Whenever the person is in danger we have to click that panic button then the alert will send to the nearby police stations. But it takes lots of situations like while the person is in danger but she can't able to click the panic button then she can't send alert to nearby police stations. For this purpose we proposed some features.

2. Proposed system

In our proposed system, we are implementing chatting feature, because the previous existed applications are not used by people so much. For that we are implementing the chatting feature. Person can chat with police and family members. If she felt I'm in danger then she can send message to polices stations or to family members. We are implementing voice detection method. By detecting our voice the alert will send to the police stations. And we are providing one panic command by spelling that panic command the app get started automatically and detects the voice and send alert to the nearby police stations and family members. We can send the alert through the SMS format including location by using GPS tracking.

Advantages

- This system protects women when they are in danger.

- In this system, an idea is proposed for saving a victims life in a faster way possible.

- It will send the alert with their location to their family members and police station.

- When victim said the command "Suraksha help me " this application takes this command and send the alert with their location to their family members and police stations

- It displays daily news.

- It contains all acts which are related to women.

- It contains security tips to how to they save themselves in danger situations.
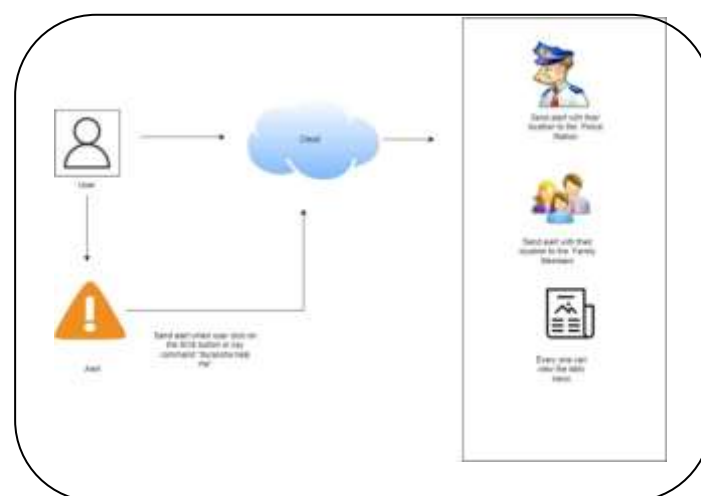
3. SYSTEM ARCHITECTURE

Fig-1 Architecture

The architecture describes the work flow of sending alert to the police stations and family members. In this system when user in danger and facing problem with strangers then she can spell the panic command then automatically the app will get started and send alert in the form of SMS including location to the family members and police stations. Here we can see the daily news and ACTs which are proposed to protect the women.

4. Module Description:

User:

- Login
- My Profile
- Home
- Call 100
- Message Family
- Nearby Police Stations
- Emergency Numbers
- SOS button
- Daily News
- Acts
- Protect Yourself
- Track My Travel
- Enable Voice Alert.

Fig-2.:Home Screen

Fig- 3: profile screen

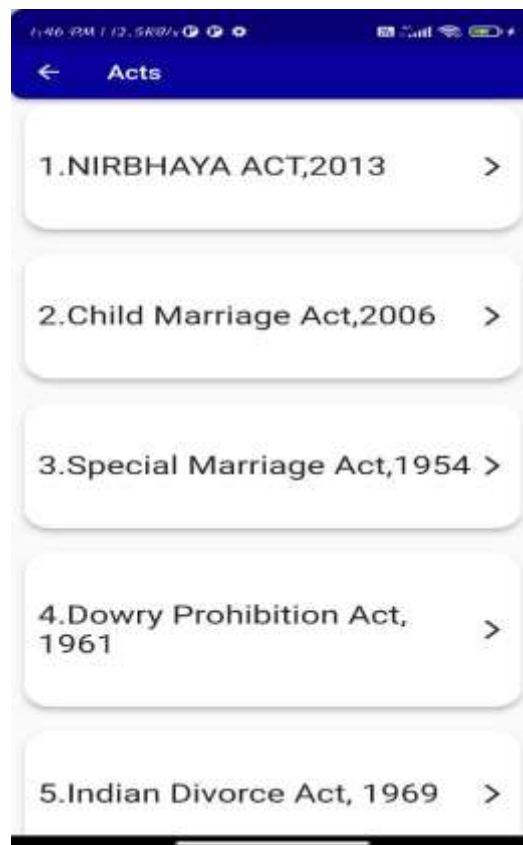Fig-4: Techniques to protect our self

Fig-5: ACTs provide for women safety

- Login: User can securely log into their account

- Home: Home screen contains quotes about women and important articles about women (call 100, messagefamily, emergencynumbers, nearby police station).

- My profile: This option allows the users to view or update profile details like, mobile number and emergency contacts details.

- Call 100:This feature is help to directly call to the police stations

- Message Family: When someone thought that they are in danger like they have doubt about some person at that time they can chat with their family numbers in this feature

- Nearby Police Stations: They can see their nearby police stations in this feature.

- Emergency Contact numbers: In this feature emergency contact numbers are there like (100, 101, 108, etc.).

- SOS button: When user click on this button it sends the alert with their location to their family members and police stations.

- Daily News: User can view the daily updated news.

- Acts: By this option user can view the acts which they are related to women.

- Protect Yourself: By this option, User can view the tips how to protect themselves at they are in danger.

- Enable Voice alert: Only when user enable this option it takes the command "Suraksha Help me" otherwise it doesn't receive

5. Methodology

Cell tower trilateration (sometimes referred as triangulation) is used to identify the location of the phone. A cell phone constantly emits roaming radio signals that may be picked up by three or more cell towers enabling the triangulation to work. Trilateration calculations estimate the coordinates of a mobile device using the coordinates (longitude, latitude) of nearby cell towers as well as the estimated distance of the device from the cell towers (e.g. either based on signal strength or by measuring the time delay that a signal takes to return back to the towers from the phone).In this challenge we will investigate the math equations used in trilateration calculations. We will simplify the process by using a 2D model of the problem based on (x, y) coordinates (as an alternative to longitude/latitude coordinates).
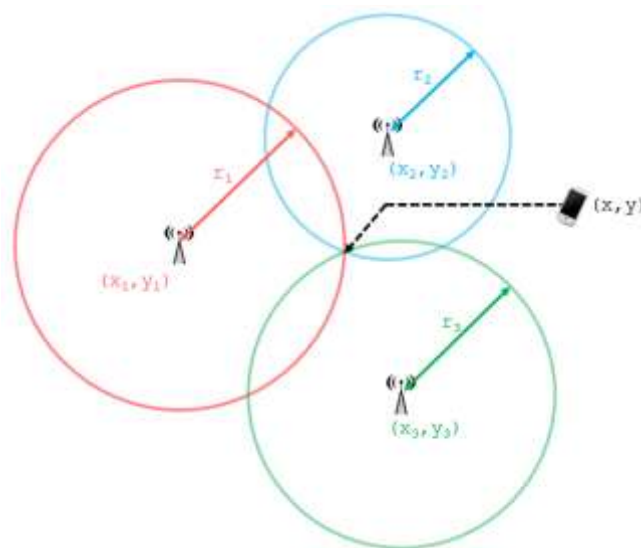
On the diagram above, each circle represents all the possible locations of a mobile phone at a given distance (radius) of a cell tower. The aim of a trilateration algorithm is to calculate the (x, y) coordinates of the intersection point of the three circles. Each circle is defined by the coordinates of its centre e.g. $(x_1, y1)$ and its radius e.g. r_1.

The following steps will help us calculate these (x, y) coordinates:

Step 1

the three equations for the three circles are asFollows:

$$(x - x_1)^2 + (y - y_1)^2 = r_1^2$$
$$(x - x_2)^2 + (y - y_2)^2 = r_2^2$$
$$(x - x_3)^2 + (y - y_3)^2 = r_3^2$$

Step 2:

We can expand out the squares in each of these three equations:

$$x^2 - 2x_1x + x_1^2 + y^2 - 2y_1y + y_1^2 = r_1^2$$
$$x^2 - 2x_2x + x_2^2 + y^2 - 2y_2y + y_2^2 = r_2^2$$
$$x^2 - 2x_3x + x_3^2 + y^2 - 2y_3y + y_3^2 = r_3^2$$

Step 3:

Now let's subtract the second equation from the first:

$$(-2x_1 + 2x_2)x + (-2y_1 + 2y_2)y = r_1^2 - r_2^2 - x_1^2 + x_2^2 - y_1^2 + y_2^2$$

Likewise, we can now subtract the third equation

From the second:

$$(-2x_2 + 2x_3)x + (-2y_2 + 2y_3)y = r_2^2 - r_3^2 - x_2^2 + x_3^2 - y_2^2 + y_3^2$$

Step 4:

Let's rewrite these two equations using A, B, C, D, E, F values. This would result in the following system of 2 equations:

$$Ax + By = C$$
$$Dx + Ey = F$$

Step 5:

The solution of this system is:

$$x = \frac{CE - FB}{EA - BD}$$
$$y = \frac{CD - AF}{BD - AE}$$
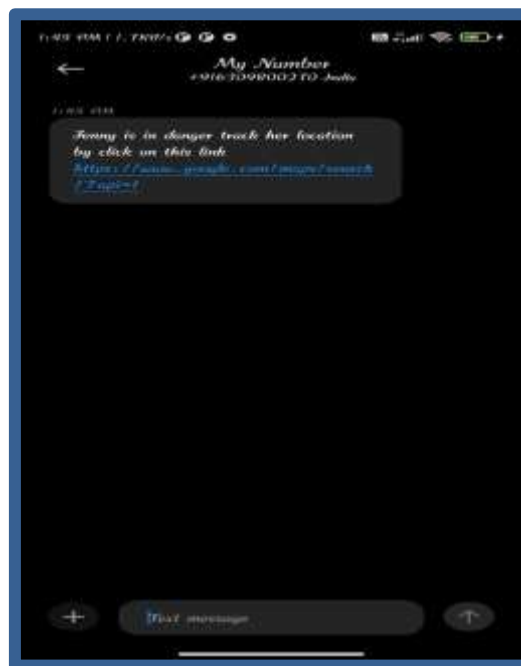
6. Result analysis

Fig-6: sends location to the police station and family members

When user click on the alert button it sends the location link to the family members and police stations, when family members click on this link it directly navigate to the google maps then they can easily find the route to their user.

7. Conclusion

In this project GPS is used for track the location. And we are using trilateration algorithm. When the person is in danger the alert will send to the police stations and family members in the form of SMS and including location of the person. We are providing voice detection method to send the alert.by detecting the voice the app automatically send the alert to the concern persons.

9. References

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