Women Safety Tech: Panic Button Website

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Abstract

Women's safety has been the primary concern for every person. Enhancing the condition of women is essential for global prosperity. Throughout history, women have always been held in esteem in society. Nevertheless, women of every stage of life, including children and babies, continue to face assault, harassment, and crimes globally. The proposed methodology offers the latest and most advanced tools like Flask framework Python for a safety platform that enhances the personal security of women by pressing the panic button available in the application. This platform uses HTML, Flask, Python, and Twilio to design an emergency panic button that initiates a sequence of automated actions for prompt assistance. It is intended to be dependable and efficient. The user's smartphone promptly sounds an alert upon touching the panic button, attracting the attention of everyone in the vicinity. Simultaneously, the system alerts pre-selected emergency contacts by SMS and call by saying pre-written alert tune to emergency contact with the user's current position to obtain the user's coordinates, using the HTML5 Geolocation API, which fetches the device's current latitude and longitude. If geolocation is successful, the coordinates are provided via a callback function and a distress message, enabling instant action.

Keywords: global prosperity, Geolocation, latitude, longitude.

1. Introduction

In this women's safety website, is dedicated to providing a secure environment for women everywhere. In a world where safety concerns are prevalent, especially for women, leveraging technology becomes crucial in ensuring personal security and peace of mind. At the heart of our initiative lies the Panic Button feature, powered by Python and Twilio service providers. Use the HTML5 Geolocation API's method to retrieve the user's current latitude and longitude coordinates from their device. To create a panic button that fetches the user's latitude and longitude, implement an HTML button element and use Flask Framework to add a click event listener. This applications and sites that employ geolocation services work beginning by asking the user whether he/she agrees to have his/her location known. Once this is done, the application then employs the in-built device services meaning for instance GPS to establish the location of the user. This is followed by the extraction of the latitude and longitude are numerical values that denote the precise location on the globe. This innovative solution empowers women to quickly seek assistance in times of distress with just the click of a button. Whether you're walking alone at night,

commuting, or facing any form of threat, this panic button is instant connection to help and support. This methodology aims to foster a community of safety-conscious individuals, where women can feel empowered and supported in every aspect of their lives.

2. Literature Survey

Monisha, D. G et al [1]. describe the femme safety gadget and smartphone application which uses an arm controller and is intended to safeguard women is introduced in the publication Femme can be accessed as a smartphone app or as a physical device that is powered on simultaneously pushing the power and volume buttons the audio recorder SOS message video recorder and concealed camera detector are the four primary features it is connected to a smartphone and features buttons for hidden camera detection and emergencies the emergency button has three functions a double click that activates the audio recorder and transmits an emergency message a long press that immediately dials a preset contact and a single click that sends GPS updates to preset contacts every two minutes femmes arm controller ensures effective low-power functioning even in the absence of internet connectivity. The limitations of this paper are, the device/application FEMME can be made better and the usage can be increased by making the product small so that it can be used as a watch or even a pendent also there can be a voice keyword recognition which can trigger the device to send an emergency message to the preset contacts. Ranjini R et al.[2] the analysis of these technologies demonstrates the progress made in women's safety gear exhibiting a range of strategies from GPS tracking and sensor integration to electric shocks and loud alerts every solution offers special features that tackle various facets of personal security still it is clear that there is a demand for integrated solutions that incorporate several characteristics future advancements in protecting women's safety should concentrate on improving battery life introducing voice activation including protection

mechanisms and creating small wearable gadgets that are easy to use. The proposed methodology uses a single button to immediately alert selected contacts of the user's trouble and reveal their location. This personal safety app assures that people are never alone in dangerous situations. Users enter the names and phone numbers of their emergency contacts, allowing them to reach out to many people in case of need. When you press the SOS button, the app will send notifications or SMS to the specified contacts right away. In addition, the app provides crucial first-aid advice for dealing with emergencies. Various systems have been developed to enhance women's safety, each employing different technologies and approaches. Mareeswari et al. [6] integrated an embedded system with an Android app, utilizing RL8 microcontroller and voice commands to trigger alerts and notifications. Sunil K. et al. [7] proposed a device combining Arduino Uno with GPS and GSM modules for geofencing-based alerts. Unnamed authors utilized sensors like temperature, accelerometer, and heartbeat sensors with Arduino Uno for monitoring women's parameters in hazardous situations. Deep Inder Kaur et al. [8] designed a prototype with a shock system for self-defense and SMS alerts. Another unnamed group proposed a jacket-like security system with temperature sensing and LCD display. Additionally, a team developed a prototype using RFID technology for location tracking and GSM communication. G C Harikiran et al. [9] created a wristband device with Bluetooth connectivity for sending body parameter information to initiate emergency calls with GPS assistance. These systems collectively demonstrate the diverse approaches to leveraging technology for women's safety, encompassing tracking, self-defense, and emergency communication. The limitations in this paper [9] are, That the smart band should also be able to produce an alarm or buzzer sound so that it can be used to get public attention and the people can contribute to providing justice. E. Sankar1 et al. [6] describes discusses a mobile application designed to enhance women's safety. Motivated

by increasing violence against women, the app addresses limitations of existing solutions by enabling multiple contact alerts, continuous GPS tracking, and gesture-based distress signals. It integrates with local emergency services and provides self-defense resources. The system includes an admin module for managing users and feedback, and a user module for registering contacts, sending alerts, and sharing location. This app offers a significant improvement in personal security through advanced mobile technology features. This paper [7] addresses the growing issue of gender-based violence in urban public spaces and public transport. It uses crime data from major Indian cities to highlight the high rates of violent crimes against women, particularly in Delhi. To counter these challenges, various measures have been implemented, including international conventions like CEDAW, national policies such as the National Policy for the Empowerment of Women, and key legislations like the Criminal Law Amendment Bill (2013) and the Sexual Harassment of Women at Workplace Act (2013). Technical initiatives to enhance safety include installing CCTV in public transport, creating women's security helplines, launching the R-Mitra app for railway safety, and implementing dedicated women's coaches and reserved seats in metro systems. These efforts aim to improve women's safety through legal protections, enhanced security infrastructure, and increased public awareness.

3. Methodology

3.1 Start; This is the initial step that represents the initiation of the process when the user interacts with the website.

3.2 Python flask backend; The backend is implemented using the flask framework in Python the flask server handles HTTP requests and serves the HTML frontend to the user it includes routes to manage form submissions where users input their latitude and longitude coordinates. Flask framework in the panic button system the flask framework serves as the

backend for the panic button system handling server-side logic and communication with Twilio when a user clicks the panic button their coordinates are sent to the flask server via an http post request flask processes these coordinates ensuring they are valid and formatted correctly it then uses the Twilio API to send an SMS and initiate a voice call to emergency contacts.
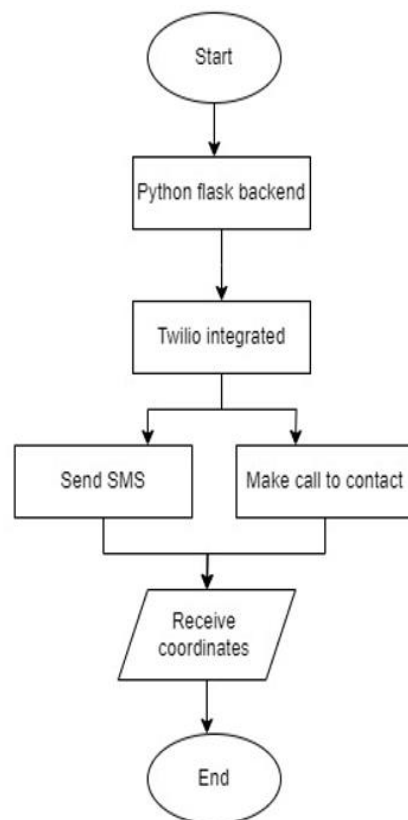

Figure 1: Flow diagram of proposed system

Flasks lightweight and flexible nature make it ideal for such applications providing robust routing request handling and integration capabilities without unnecessary complexity this ensures that emergency alerts are efficiently processed and delivered enhancing the systems reliability and responsiveness.
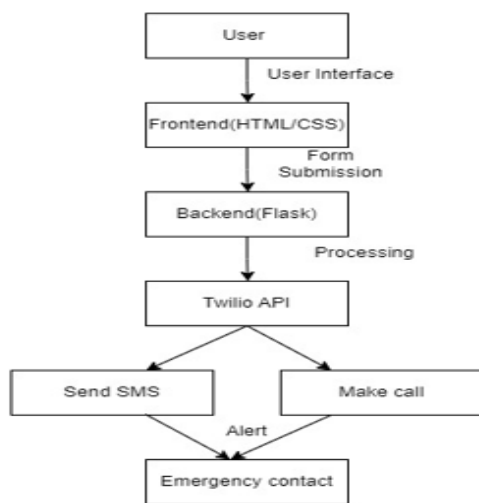
Figure 2: Block diagram of Flask framework

3.3 Twilio integration; The flask backend integrates with Twilio services to enable sending SMS and making calls this involves configuring the Twilio account with the necessary credentials account SID and auth token and initializing the Twilio client the backend prepares the integration by setting up the Twilio phone number and the emergency contact number this integration is critical for sending out alerts.

The architecture for feeding Twilio into a panic button website is arranged to guarantee clear and effectiveness communication in mishap incidences. This process starts with the user, who navigates to the website and operates the panic button from the HTML/CSS. It sends the latitude longitude of the user when the panic button is clicked to the backend server.

The backend which is built with Flask framework in Python executes the received coordinates. It ensures the accuracy of the data and gets it ready for sending a request to Twilio's API. The back end then uses the Twilio API to send out the notification. It is through the API that an SMS is used to convey the coordinates to the emergency contact as well as using the API to make a voice call to convey the same coordinates.

In addition to sending SMS, the system includes the use of voice call notification to guarantee that the contacts are notified in different ways. This redundancy increases the chances of responding to emergencies by increasing the availability of backup personnel. This architecture is illustrated below in the diagram where the information flows from the user to the emergency contacts through the frontend, backend then to the Twilio API.

Figure 3: Architectural diagram of Twilio integration

In the above diagram says that, website sends the HTTP request to Twilio and Twilio send back the response to that request and simultaneously it sends SMS and call to phone which defined as emergency contact.

3.4 Send SMS; when the coordinates are received the backend constructs a message containing the coordinates and sends it to the emergency contact via SMS using the Twilio API.

3.5 Making call to contact; Make a call simultaneously with sending the SMS the backend initiates a call to the emergency contact using Twilio a voice message is prepared often using Twilio markup language which includes the coordinates of the call to ensure that the emergency contact is alerted through both text and voice.

3.6 Receive coordinates; The backend receives latitude and longitude coordinates from the user form submission this involves extracting the data from the HTTP request and performing further validation to ensure accuracy.

In this geolocation services work beginning by asking the user whether he/she agrees to have his/her location known. Once this is done, the application then employs the in-built device services meaning for instance GPS to establish the location of the user. This is followed by the extraction of the latitude and longitude are

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numerical values that denote the precise location on the globe. It involves determining the straight-line distance between two points in a 2D space (e.g., on a map), this can use the Euclidean distance formula:

$$distance = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \quad (1)$$

Where (x1, y1) and (x2, y2) are the coordinates of the two points. The above Equation 1 calculates the shortest distance between two points in a Cartesian coordinate system.

3.7 End; After successfully sending the SMS and making the call the backend sends a response back to the frontend to inform the user that the alert has been sent the frontend displays a confirmation message to the user indicating the successful execution of their action.

In SOS, when user clicks button call will connect to 112 emergency health info in that response rate is comparatively lower than this methodology. Here the call connects directly to guardian/parents so the responding time is so fast than SOS.

4. Experimental results

This project contains five modules that is five major python files, one HTML file and one single homepage in that two alert prompts are designed. In one flask file four sub-XML files are present in it.
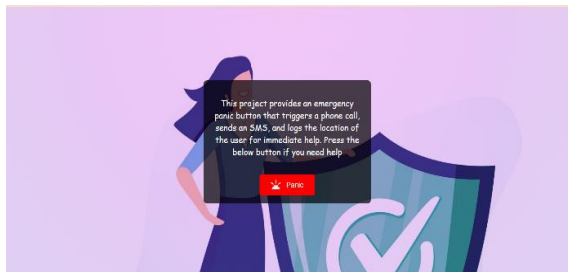

Fig 4: Homepage

This is the first page of project, where user can get to know about the use of panic button briefly.
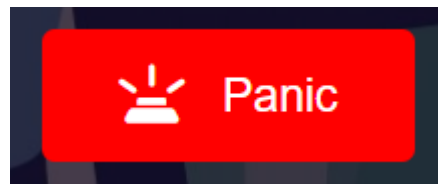

Fig 5: Panic button

The above button is main thing in this project, by clicking on that button action will be takes place.
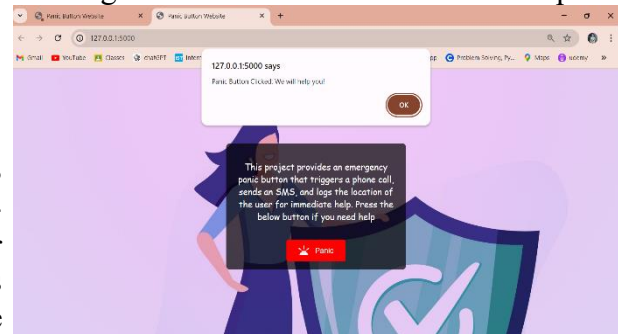

Fig 6: Confirmation message is popped

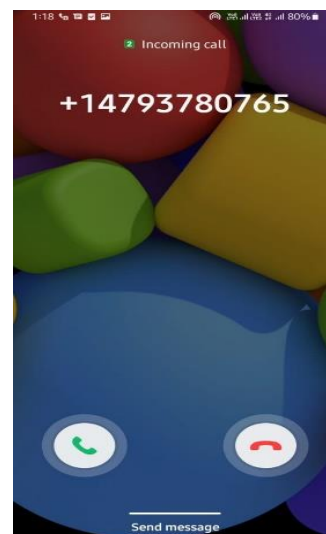After clicking on that panic button new confirmation alert prompt will be opened.

Fig 7: Making call to emergency contact

Call will be transformed to pre-defined emergency contact with pre-defined text as caller tune.
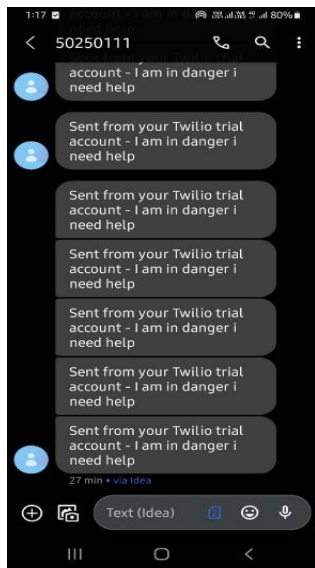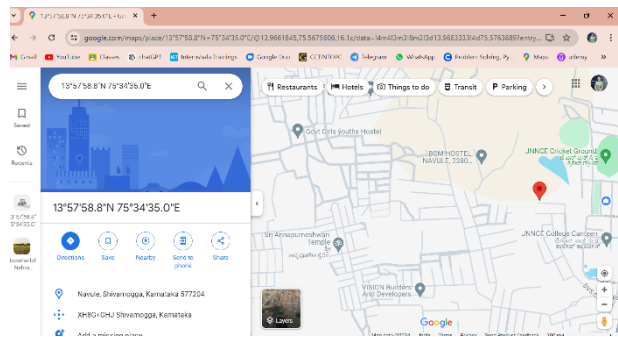
Fig 8: SMS is sent to emergency contact

Fig 10: Obtained coordinates will search in maps

After call and SMS coordinates will be obtained by longitude and latitude, then that can be searched in google maps to get the exact location of user.

Along with call simultaneously SMS is also sent to pre-defined emergency contact with an alert message.


```python
from twilio.rest import Client

# Twilio credentials
account_sid = 'AC4fbfb996bb846c43c234c28f2429cd37'
auth_token = '18180a51b85af7ffba92000255c661b0'
twilio_phone_number = '+14793780765'

# Your phone number (the recipient)
to_phone_number = '+918150943182'

# Message to send
message_body = 'I am in danger i need help'

# Initialize the Twilio client
client = Client(account_sid, auth_token)

# Send the message
message = client.messages.create(
    body=message_body,
    from_=twilio_phone_number,
    to=to_phone_number
)

print(f"Message sent with SID: {message.sid}")
```

Fig 9: Code for obtaining sending SMS

Using Twilio SMS is sent to recipient (emergency contact) with initializing SID and token given by Twilio service provider.


```python
try:
    from geopy.geocoders import Nominatim

    # Initialize Nominatim API
    geolocator = Nominatim(user_agent="geoapiExercises")

    # Get the current location of the user
    location = geolocator.geocode("1600 Amphitheatre Parkway, Mountain View, CA")

    print((location.latitude, location.longitude))

except Exception as e:
    print(f"Error: {e}")
```

Fig 11: Code for obtaining coordinates

Code snippet of python file which contains geolocation API by this obtaining longitude and latitude is possible. In this proposed methodology contains more accuracy than other proposed systems and can see the difference in the below table

Author name	Technology used	Limitations
[1] Monisha, D. G et al.	Audio and video reordering along with camera detection sending to contact using GPS.	The device/application which contains heavy and more modules and technologies which leads to not so easy to use regularly.
[9] GC Harikiran et al.	Bluetooth connectivity for sending body parameter information to initiate emergency calls with GPS assistance.	In this device/application it doesn't produce any kind of sound to get the people's attention.
Proposed methodology	Twilio service provider for sending SMS and making calls and geolocation API for fetching coordinates and Flask for designing	In this methodology, the it is little bit difficult to open website when in critical condition but it is new idea, in future it can made as application to get rapid response.

Table:1 Comparative Analysis

5. Conclusion

In conclusion, the creation of a panic button website that includes functions such as capturing latitude and longitude coordinates upon activation and generating SMS and call notifications to emergency contacts via Twilio marks a significant improvement in personal safety technology this integrated solution ensures that users may quickly tell selected contacts about their exact location in times of emergency allowing for faster reaction and potentially saving lives the website provides a seamless and dynamic user experience by combining HTML for the user interface and python for backend processing this program not only improves personal security but it also exhibits the transformational power of merging web technologies and communication APIs to efficiently serve vital demands in emergencies. In future this methodology can built as application for easy availability or it can also be merge with google to set this website as default website. Voice command can also enhance to handle in critical situations.

References

1. Monisha, D. G., Monisha, M., Pavithra, G., & Subhashini, R. "Women safety device and application-FEMME". Indian Journal of Science and Technology, 9(10), (2016).

2. Ranjini R Chandrashekar N, et al. "WOMEN SAFETY DEVICE" JETIR May 2019, Volume 6, 2019.

3 Kalpesh Dhumal, Aniket Sada Phule, Vikas Abrade "GPS-GPRS Based Women Tracking System and Women Safety Application using Android Mobile for Devendra Thorat", Volume 1 April-2014

4. Ms. Priyanka Y. Gonde1, Mr. P.B. Ghewari "REVIEW PAPER ON WOMEN SAFETY SYSTEM" Volume: 08 International Research Journal of Engineering and Technology (IRJET) Issue: 01 | Jan 2021.

5. Sasikumar, S. Prabha, K. Sai Saketh, Chaitanya Raghava "Design and Implementation of Women's Safety System in Any Problematic Places Posted" 31 May 2022.

6. E. Sankar1, CH. Aditya Karthik, A. Sai Kiran3 "Women Safety App" Volume 10 Issue III Mar 2022 ISSN: 2321-9653.

7. Lok sabha secretaria safety of women: challenges and measures implemented With Particular Focus on Public Transport No. 9/RN/Ref./February/2016 www.unwomen.org

8. Deep Inder Kaur et al. "IOT Based women security: A contemplation" International Conference on Emerging Smart Computing and Informatics (ESCI) March 2020.

9. G C Harikiran "Smart security solution for women based on IOT" International conference on electrical, electronics and optimization techniques,2016.

10. Prof. Basavaraj Chougula, Monika Monu, Priya Patil and Priyanka Das, "SMART GIRLS SECURITY SYSTEM", (IJAIEM) 2014.