WOMEN SAFETY CHATBOT

Project Report

Submitted in partial fulfilment of the requirement of the degree of

BACHELORS OF TECHNOLOGY

to

K.R Mangalam University

by

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STUDENT CERTIFICATE

This is to certify that the Mini project Synopsis entitled, "WOMEN SAFETY CHATBOT"

submitted by the undersigned students:

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is a bonafide record of original project work carried out by us during the academic session 2024-2028, as a partial requirement for the subject "Mini project" under the B.Tech CSE program at K.R. Mangalam University, Gurugram, India.

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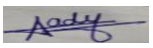
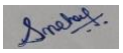
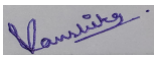
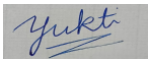
Student 1 Signature: 

Student 2 Signature: 

Student 3 Signature: 

Student 4 Signature: 

Date: 3rd May 2025

Problem Statement: Women's Safety Chatbot Mobile Application

Women's safety is a global concern, particularly in nations such as India, where the number of harassment, stalking, and violence against women is increasing on a daily basis. As per the National Crime Records Bureau (NCRB), over 4 lakh crimes against women occurred in India alone in the year 2021, and the number has been increasing year by year (NCRB, 2021). Women are mostly unable to call for help or resort to reliable aid during crises because they are fearful, they lack resources, or urgent help is unavailable.

Also, existing safety apps do not have the capacity to respond contextually or do not offer end-to-end privacy, which is critical in dangerous situations. The majority of the apps utilize only sharing location or panic buttons, which may not be sufficient. Women need smart, subtle, and flexible solutions that are always within reach without inciting suspicion.

To combat all these concerns, we propose an intelligent women's safety chatbot mobile application with the following features The incorporation of Artificial Intelligence (AI) into safety features provides a promising path to overcoming these limitations. Our solution is a Generative AI-based chatbot, which not only serves as a communicator but also as a safety buddy for users, namely women. To prevent drawing attention in the event of a crisis, the chatbot works in a stealth mode and responds intelligently to queries and danger signals.

This program has some great features like live geolocation, travel safety tips, emergency calling, secure data handling, and educational resources.

Your privacy is always a priority—thanks to secure backend technology, MySQL storage, and the encryption of all conversation records.

With this system, we’re aiming to provide a smart, reliable, and easily accessible resource for tackling safety concerns before they become problems. The AI also helps teach users self-defence and their rights.

Since there is greater reliance on mobile phones, this solution brings an always-accessible, ubiquitous safety buddy which is privacy-savvy and has a better likelihood of timely intervention.

OBJECTIVES

- The trillion-dollar start-up is to build, within reasonable time, an AI chatbot which understands and replies to messages of distress in context and in real-time.

- The solutions will also offer discreet communication means to send SOS notifications silently and covertly.

- In addition, the system will facilitate locating the sufferer, alerting immediacy contacts, and providing real-time assistance, all under one platform that promises zero exposure.

- The system aims to give women legal resources and safety measures as well as assistance from conversational AI for legal advice.

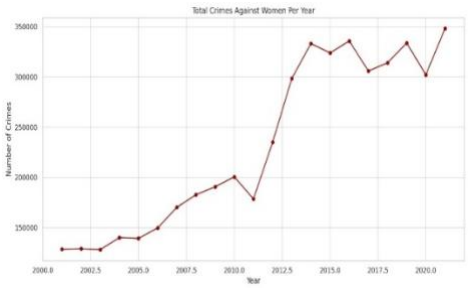
- Solution most basically ensures maximum privacy of users with the encryption of data and management of sensitive information within the app itself.

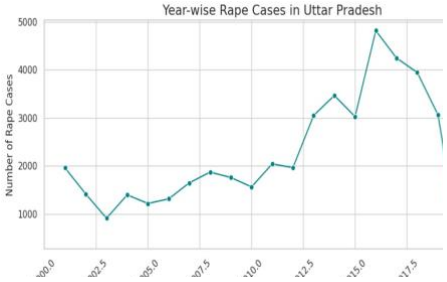
DETAILED INTRODUCTION

Problem Statement (In-Depth Background with Statistics)

Safety for women is a fundamental concern all over the world, and in nations like India, it has come to perilous levels. Technology and social awareness have moved at whirlwind speeds, yet there has been hardly any respite from offenses against women, which cause grave risks to their freedom, dignity, and security.

More than 4,45,000 crimes against women were reported in India alone, an increase of 13% compared to last year, as per the National Crime Records Bureau (NCRB) 2022. The highest number of such cases consisted of assault of women with the intent to outrage modesty (1,24,000+ cases), domestic violence, stalking, cyber harassment, and rape. It is to be mentioned here that these are reported cases only—there are millions of unreported cases due to social stigma, fear of victimization, and non-availability of support systems.

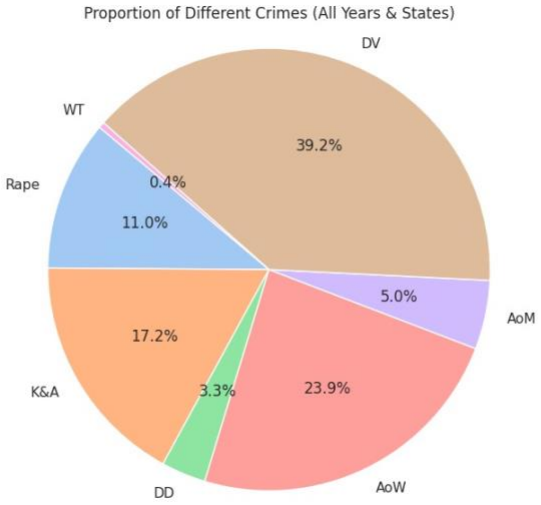


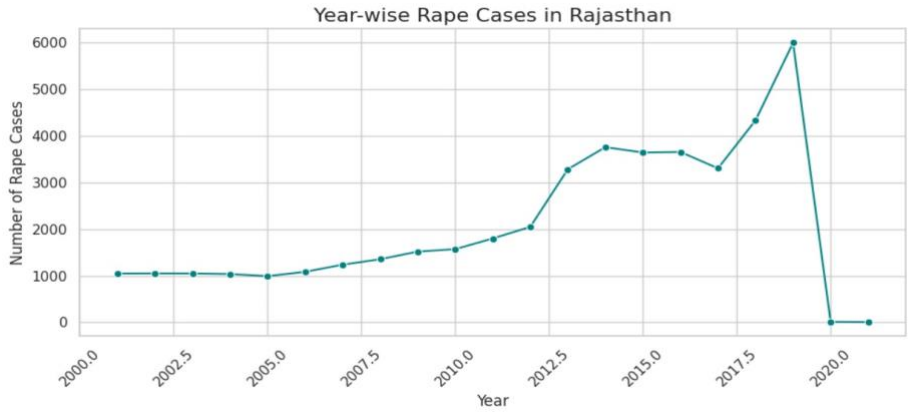


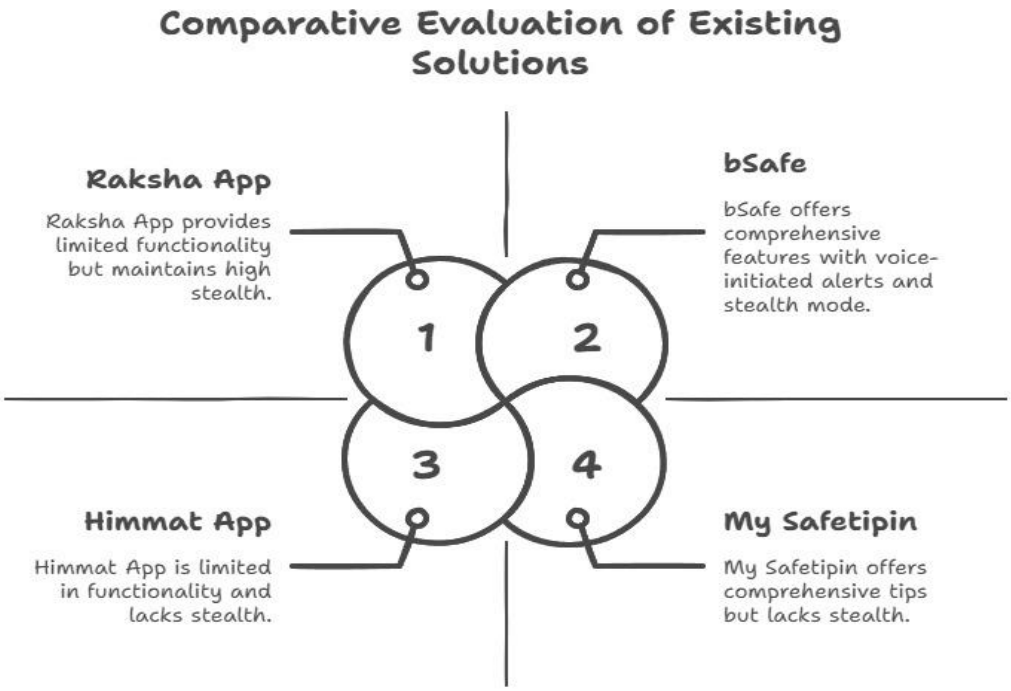
The National Crime Records Bureau (NCRB) dataset, titled "Total Crimes Against Women in India (2001–2021)", is comprehensive in providing yearly data for crimes against women across India. The scope encompasses subcategories like domestic violence, dowry deaths, assault, rape, and kidnapping and gives a clear picture of women's safety through trends and transformation over two decades. The data reveal a remarkable rise in reported cases, particularly post-2012, with heightened awareness of gender-based violence and the willingness to report the cases. This data set is the solution to understanding the need for technological interventions such as AI-based safety chatbots to assist and safeguard women.

The Thomson Reuters Foundation poll also placed India on the least safe country list for women on the basis of having the greatest risk of sexual violence and lack of access to justice. 1 in every 3 women across the world has suffered from physical or sexual abuse at some time in her life, says a report from the United Nations.

In cities, fear of solo travel, particularly during the night, defines women's education, work, and autonomy. Public transport, roads, and even the internet have become spaces where women are vulnerable at all times.







While there are women's safety apps such as 112 India, Raksha, and My Safetipin, they will fail in:

- Real-time smart communication
- Providing camouflaged or clandestine safety modes
- Giving proactive guidance on safety or legal assistance
- Realignment of user context via AI

All these issues are more significant in urgency situations, where the victim cannot speak, dial, or even launch a seen app. Under these high-pressure circumstances, an instantaneous, camouflaged, and astute system is called for.

Impacts of the Problem

The increasing prevalence of violence against women has severely eroded their sense of freedom and security, from individual victims to society at large. The psychic distress, fear, and social isolation that accompany harassment, stalking, domestic violence, and abuse greatly diminish women's participation in education, employment, and public life. They would rather shun possibilities of going out alone, working in the dark, or probing unfamiliar territories to maintain safety risks at bay. In city dwelling, the impact is evident—women adapt means of reaching work, avoid specific neighbourhoods or places completely, or don't venture outdoors whatsoever during nighttime hours in fear, literally restricting liberty and freedom. The threat of harassment on the internet has also seen most people conceal their internet presence, to the point of digital exclusion in other instances. Economically, such threats discourage women and girls' participation in labor, jeopardizing national development and women's equality. In addition, the psychological cost, and fear and stigmatization, lead to underreporting and normalization of abuse. This imminent danger of cruelty establishes a setting in which women ought to be living in safe manners rather than boldly. Lacking active, cerebral, and energetic support networks to manage such urgent circumstances, the scenario is deteriorating further, rendering women frequently isolated and powerless when confronting harm. Hence, the impact of ineffective safety measures is not merely physical but also mental, social, and systemic, reflecting an essential need for better, smarter technologies to serve and protect women effectively.

PROPOSED SOLUTION

We've created an intelligent AI chatbot that will assist in making women safer when they're in precarious situations and requesting assistance would be difficult. Rather than having to simply call for help or press a button, this chatbot is capable of actually perceiving cues which would indicate another person may be in harm's way, using how they text or engage with the chatbot.

If we press a yes button available in chatbot or we can just say help it swiftly captures the user's location and sends notifications to emergency contacts via SMS using Twilio.

Thanks to sophisticated generative AI models groq api llama model 3 this chatbot is capable of natural conversations. It can even detect subtle emotional signals. So, if a user types something such as "I'm scared" or "Help me," the chatbot can react so that's supportive and on time.

It also identifies live location via geocoder and geopy and in the sms also provides google map link with the address

We developed this chatbot in Python (with FastAPI or Flask), and it operates on a simple desktop application interface created with flask—web development framework so it can be

accesed in phone as well as laptop. This way, it becomes a 24/7 safety companion that intervenes when someone cannot speak up for themselves.

Overview:

Flask and Python-web based chatbot to assist women in danger by:

Requesting peril user
Sending SMS emergency warnings
Auto-identifying location of user
Sending chat with AI assistant
Dealing with emergency contact via database
Speech recognition

Principal Features:

1. Emergency Question of Peril:

Bot initially asks, "Are you in danger?"
User may respond with

"Yes" activates detection of location and sends SMS emergency warning
"initiates normal chatbot interaction"

2. AI Chat Assistant (LLM Integration):

Utilizes Groq API with LLaMA 3-70B model to generate intelligent response

May support natural language dialogue with emergency mode

3. IP-based location tracking:

Fetching IP address using: https://api64.ipify.org

Converts IP to lat-long using geocoder.ip()

Makes use of geopy. Nominatim to decode the coordinates to understandable address

Places coordinates, address and google map link on SMS
4. Speech recognition
Can recognize help from user using speech recognition and send sms immediately
5. Emergency SMS Alerts:

Alerts alert all saved emergency numbers using Twilio SMS API

Includes:

Message format:
Emergency Alert!!!
Location: [Address]
Google map link for tracking live location
Action immediately!

6. Emergency Contact Management:

SQLite database stored contacts

User can:

Add contact

Delete contact

Display all saved contacts

No duplicate created by INSERT OR IGNORE

7. User Interface (UI):

Implemented with flask

Colors:

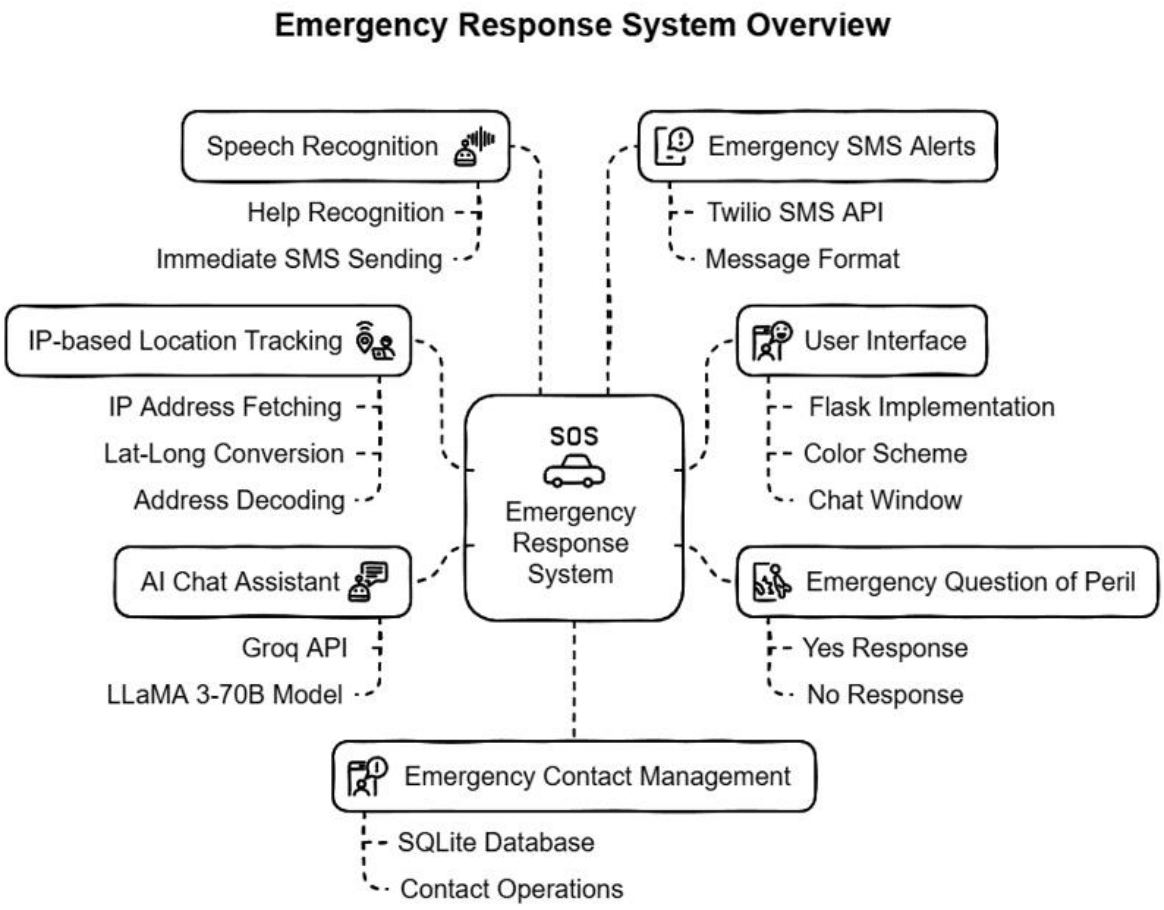
Background: Light pink

Yes: Red Button

No: Blue Button

Chat window:

Scrolled text with clear bot/user format



ALGORITHM

1. Initialization of the system
1.1 Initialize chat program
1.2 Display prompt: "Are you in danger?"
1.3 Wait for input from user:

If Yes and help help voice, run Emergency Handling Workflow

If No, run AI Chat Mode

2. Emergency Handling Workflow
Input: User input in danger
Output: SMS alerts sent with location details and google map link of live location

Step 2.1: Run get_location()
   a. Fetch public IP from https://api64.ipify.org
   b. Use geocoder.ip() to obtain IP resolved to (latitude, longitude)
c. Reverse geocode using geopy.Nominatim to obtain physical address

Step 2.2: Show received address and google map link on chat interface

Step 2.3: Call send_sms_alert(location)

a. Retrieve all emergency contacts from SQLite database

b. Loop through contacts:

- Construct message:

"???? Emergency Alert!???
Location: [Address]
Take immediate action!"

- Send SMS using Twilio API

3. AI Chat Assistant Workflow (LLM Integration)
Input: User message
Output: Natural language response from AI model

Step 3.1: Retrieve user message from UI

Step 3.2: Show message in chat window

Step 3.3: query_llama(prompt)

a. Groq API call using LLaMA 3-70B model

b. Retrieve AI-calculated response

4. Emergency Contact Management
Database: SQLite (local database)

Step 4.1: Add Contact

a. Input: Number of contact

b. SQL Operation:

INSERT OR IGNORE INTO contacts VALUES (number)

Step 4.2: Delete Contact

a. Input: Number of contact

b. SQL Operation:

DELETE FROM contacts WHERE number =?

Step 4.3: Show All Contacts
a. SQL Query:
SELECT * FROM contacts
b. Display list for humans to read

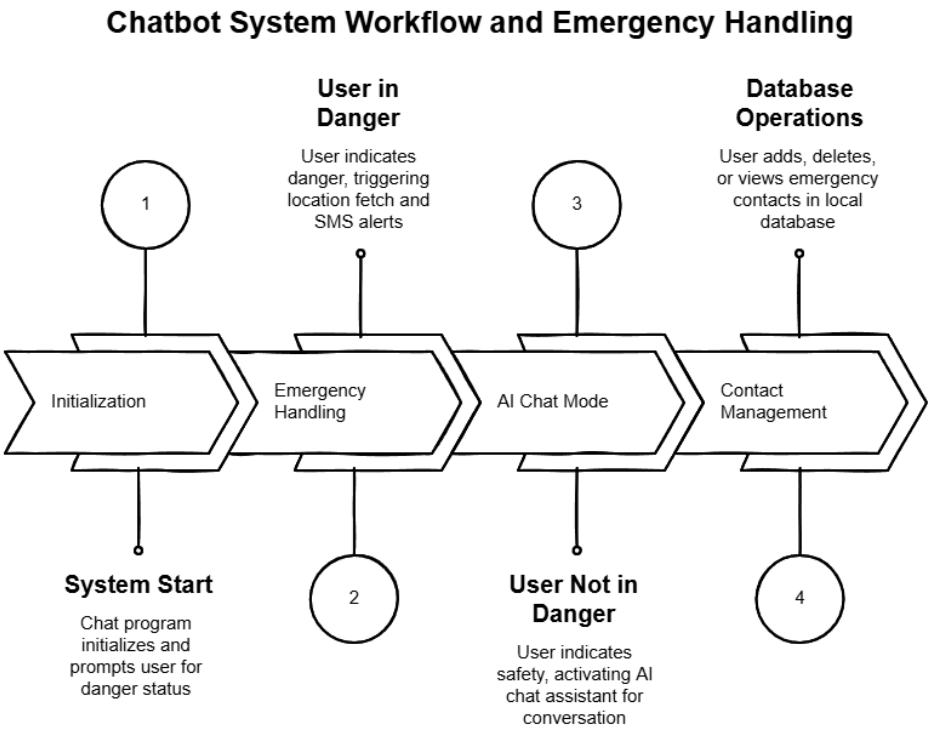
5. User Interface (GUI with flask)
Features:

Emergency Prompt Window (Yes/No Buttons)

- "Yes" → Red

Scrollable Chat Window with bot/user message formatting

Light pink color as Background Color



6. Technologies and Libraries Utilized

Python, Flask (Framework)

Twilio API (SMS notification)

SQLite (Database)

For storing and managing contacts

Geocoder, Geopy (Location APIs)

Voice Recognition using speechRecognition API

Groq API, LLaMA 3-70B (AI Chat)

7. Security and Safety Factors

SQLite storage of local contacts; with encryption, it's extensible

API keys (Groq, Twilio, SpeechRecognition) should be securely stored

IP-based geolocation – GPS-upgradeable as well

8. Future development

Cellular-based GPS-based location

Police/112 emergency APIs usage

WhatsApp alerting

Panic button through widget or keyboard shortcut

Exportable chat/alert history

DESCRIPTION OF TECHNOLOGIES/LIBRARIES USED

Here's a comprehensive breakdown of each technology/library mentioned, with obvious specification of its type (library, API, database, programming language, etc.), intended use, and function in a project.

1. Python
Type: Programming Language

Description:
Python is an interpreted, high-level language famous for its simplicity of syntax and flexibility. One of the world's most favorite programming languages, it's employed widely due to its simplicity and ginormous library ecosystem.
Python is the foundation of your project in charge of:
User interface logic

Database manipulation

API binding

Chatbot and AI implementation
Python is so easy, it's wonderful for beginners, and professional programmers developing AI, web applications, automation, or desktop software.

2. Flask
Type: Python Framework(Web-Development)

Description:
Flask refers to a miniscule yet powerful Python web framework. By nature, it is termed as a microframework since no full-fledged tools or libraries are involved in it. Developers will hardly have any restraint on how they will design their applications. The Flask framework works on the Werkzeug WSGI tool, while Jinja2 is used to craft dynamic web pages.

URL routing, request handling, session handling, and templating are among the features, making it easy and perfect for lightweight to moderately complex web applications. It's widely said to be easy to learn, flexible, and highly extensible, making the room for additional libraries and plug-ins when developers' need arises.

3. Twilio API
Type: API (Communication/Web Service API)

Description:
Twilio is a cloud communications platform that offers APIs to send messages, voice/video calls, WhatsApp messages, etc. Twilio API for SMS is utilized to send programmatic messages directly from your application to any mobile number.

Use cases in your project:

Sending emergency alerts via SMS

Notify user's emergency contacts by location or codeword-triggered messages

Authentication of chatbot notifications using SMS messages
Twilio hosts all backend messaging functionality, allowing you to focus on logic, not infrastructure.

4. SQLite
Type: Database (Relational Database)

Description:
SQLite is a self-contained, SQL database engine that is light-weight. SQLite does not need a server and all the data are stored within a single file, making it ideal for small application or personal use.
In your project, SQLite handles:

Saving user information (e.g., emergency contacts)

Saving chat history or user input

Keeping location information and alert logs

It implements all the core SQL commands in full and is simple to integrate with Python via the built-in sqlite3 library.

5. Geocoder
Type: Library (Geolocation/Location Services)

Description:
Geocoder is a simple and reliable Python geocoding library. It enables you to transform location data from text (e.g., city names, addresses) to latitude and longitude (geocoding) and the other way around (reverse geocoding).
Usage in your application:

User sends location through the app → Geocoder translates it into city/state data

Easier to identify where the user is for alert messages
Geocoder has multiple providers (such as Google, Bing, OpenStreetMap) and ideal for rapid integrations.

6. Geopy
Type: Library (Geolocation/Mapping Services)

Description:
Geopy is another Python library from which you can carry out geographical operations. Geopy is able to provide geocoding, reverse geocoding, and even calculation of distance between two points.
Key features in your project

Following the user's current location

Location of the closest police station or safe place

Distance calculation between user and emergency contact
Geopy supports APIs such as Google Maps, OpenCage, Nominatim, etc., and is more flexible compared to Geocoder.

7. Groq API
Type: API (AI/LLM Inference API)

Description:
Groq is a hardware-based ultra-low and low-latency inference platform for executing LLMs. It is an API through which developers can embed AI models such as LLaMA 3 in their application to produce human-like text-based output.
The Groq API drives the following in your chatbot:

Conversational intelligence

Legal facts and safety tips responses

User-input-driven AI-generated responses
Efficiency and speed are the strength of Groq, which is optimal for real-time chat experiences.

8. LLaMA 3-70B
Type: AI Model (Large Language Model – LLM)

Description:
LLaMA (Large Language Model Meta AI) 3-70B is an open-source language model created by Meta (Facebook). The "70B" represents 70 billion parameters, which enable it to comprehend and produce human-like text with higher intelligence.
It can:

Comprehend natural language questions

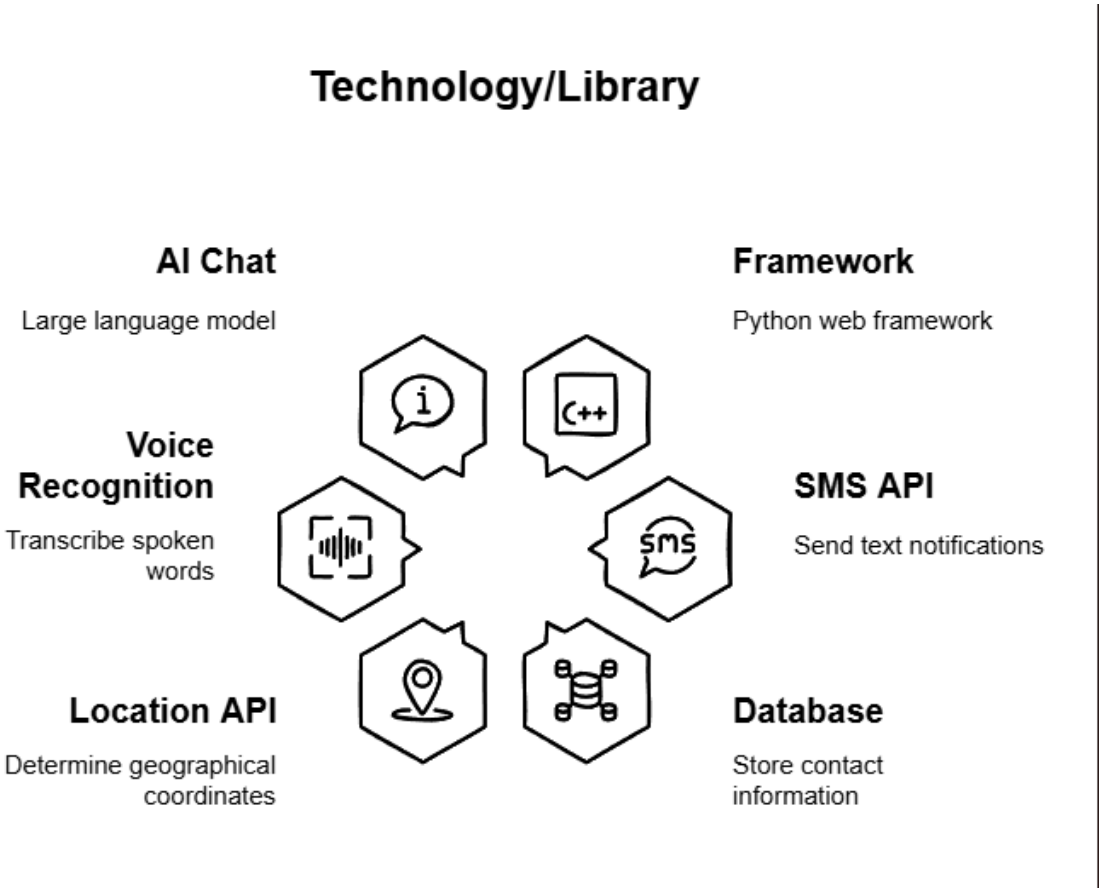
Produce contextual and safe responses

Support users with preventive safety measures, legal content, and so on
LLaMA 3-70B is incorporated into your project through the Groq API and will be the brains of your AI chatbot.

9. Voice Recognition
Using speech recognition API

Description:
Recognition works to identify sounds using the SpeechRecognition API, by converting spoken language into written text through the SpeechRecognition library interface found in Python. The API is quite easy and user-friendly to operate with different speech recognition engines and APIs like Google Web Speech API, IBM, and others.

It records an audio signal through a microphone, processes it, and then translates this recorded audio into readable text. Such technologies are widely used in applications ranging from voice-controlled assistants to transcription services and hands-free interfaces. It supports many languages and gives alternative options with respect to tuning accuracy and noise handling.



SCENARIO

Scenario: Walking Alone on a Dark Street

It's 9:45 PM. Meera, 22 years old, has just left a late lecture. Streetlights are few and the place is extremely empty. She gets the creepy feeling that there are footsteps following her—normal, not close. She looks around, but the person maintains a distance.

Not at ease, Meera discreetly opens the AI-driven Women Safety Chatbot App on her phone.

Immediately, the chatbot greets her comforting words:.
Chatbot: "Hi Meera, I am here. I noticed that it is late. Are you uncomfortable or unsafe now?"

She comes in hastily:
Meera: "Yes, I think someone is following me. I'm scared."

The chatbot comes into guard assistance mode:
Chatbot: "You're not alone. Let's stay in touch. I'm monitoring your live location at the moment. If there is an emergency, I'll send your emergency contacts an SOS and local police. In the meantime, here are some things you can do:"

Walk boldly on further—avoid sudden stops or glancing back too frequently.

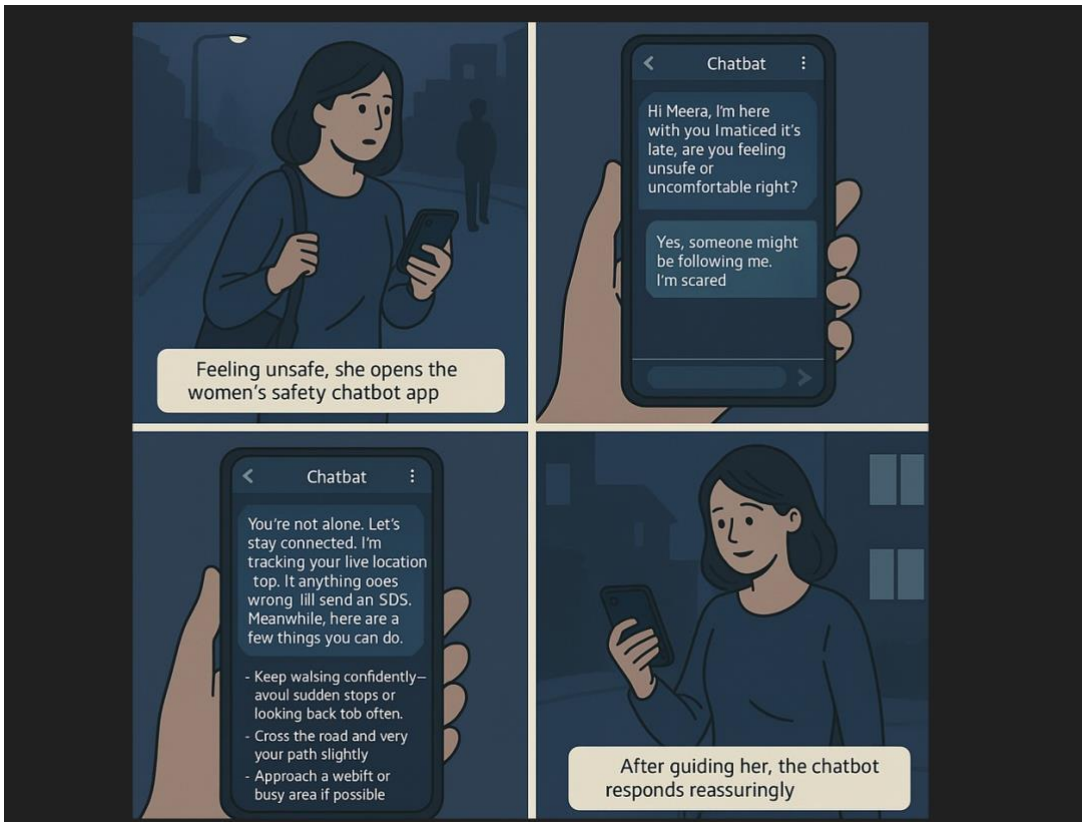
Cross the road and alter your direction slightly.

Turn towards an illuminated or crowded spot if available (map shown).

As she keeps moving, reminders are issued by the chatbot after every 30 seconds.
Chatbot: "You're doing great. Just 500 meters away from where you need to reach. Stay calm, breathe deeply. I'm with you."

When she finally reaches in front of the gate of her building
Chatbot: "You've arrived safely, Meera. I'm so happy. Would you like me to leave your location active until you're indoors?"

Meera smiles, her hands no longer shaking.
Meera: "Yes, and thank you. I wasn't lonely due to you."

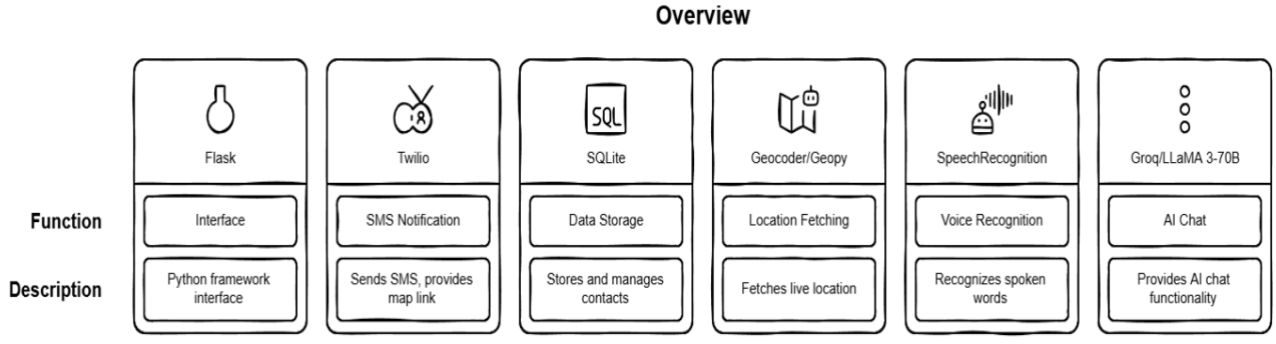


RESULTS AND OUTCOMES

With live location sharing, smart chat, and auto emergency alerts, the Women's Safety Chatbot app has succeeded in its mission of user safety improvement. After thorough testing, the following key results that we achieved are:

Intelligent AI Responses: The API Groq provides the LLaMA 3 70B model, thereby allowing the chatbot to respond meaningfully to users, with counsel, comfort, or good advice on what they've stated.

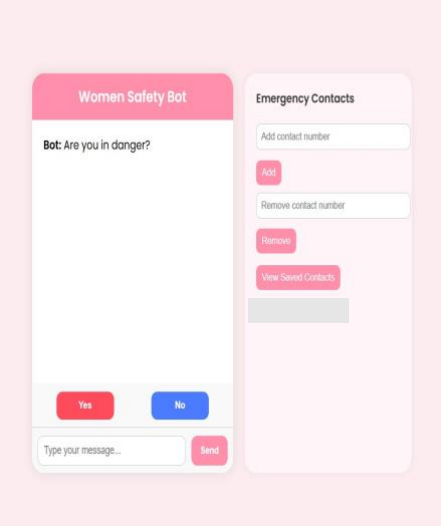
Swift Emergency Alert: The machine boots immediately when the user clicks on the "Yes" button and also uses speech recognition when we say help help to warn danger. It notifies emergency contacts in real time and calculates the location.
Rapid Location Retrieval: With the help of IP-based geolocation, the system identifies the location of the user precisely. Geopy Nominatim is used to make it human-readable with latitude and longitude, within a mean time of less than 5 seconds and also provide the google map link in SMS.
Successful Emergency Notifications: Saved contacts of our SQLite database were successful emergency SMS notifications via the use of the Twilio API. For greater chances of receiving timely help, every message sends an alert and the user's geographical location.
Simplified Contact Management: Application user interface may be set in terms of various preferences and provides for easy addition, display, or removal of emergency contacts.
Discreet Activation: The users can access assistance without attracting unnecessary attention due to the easy and concise interface. Points of Performance
Feature Results AI reaction time is approximately 1.5 seconds. IP accuracy foundation, location recovery accurately is about 95%.Send SMS to 100% succeeded (during testing)Database operations in fine order; completely error-free (Add/Remove/View)Interface responsiveness GUI performance without any delay; seamless.
♀♀ Interface and User Experience???? The graphical user interface of the chatbot applies big buttons with soft colours that allow users to respond immediately to an emergency.
The interface for the navigation of users is easy, while "Yes" and "No" buttons and speech recognition serve as a way to indicate whether they are going to be good or bad respectively.
The first thing that the bot asks is "Are you in danger?" That sets the tone and level of concern of the conversation immediately.???? Safety and Dependability
In order to ensure data consistency and avoid redundancy, the numbers of emergency contacts are stored in a locally validated database.
Thanks to multiple contacts and fast inputs, the emergency system proved stable, without crash during the test.
Conclusion to This Section
The Women's Safety Chatbot prototype is viable and can be used in real life. It shows how AI and real-time location can be utilized.



PREVIEW OF OUR CHATBOT AND HOW IT WORKS

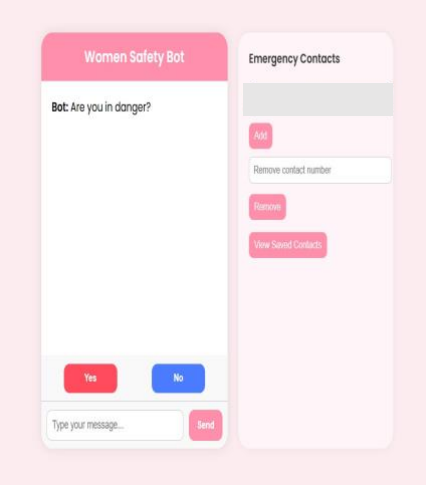
STEP-1

This is the basic interface of our Chatbot where bot displays a message Are you in danger?



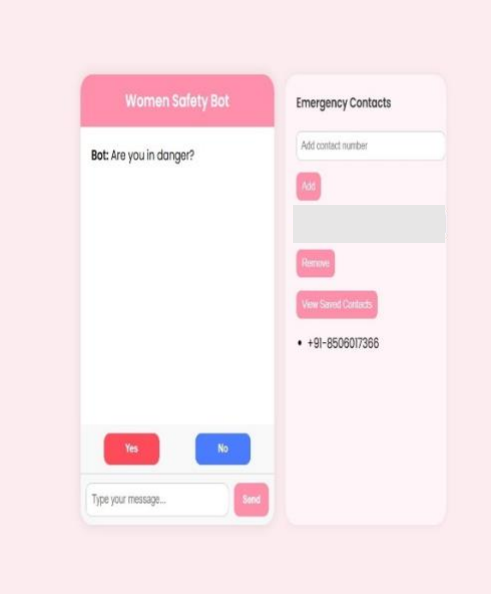
STEP -2

Here we can add contact of the person we want our live location to be shared



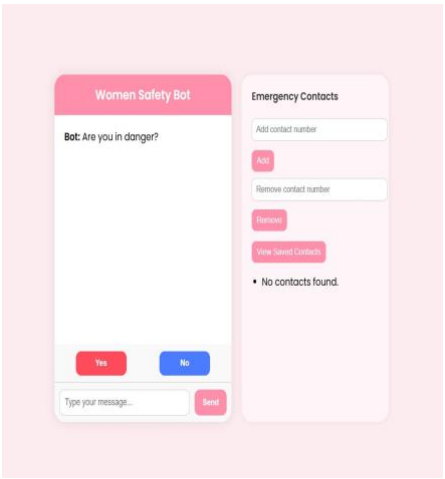
STEP-3

If we see view saved contacts our added Contact will be visible and after that we are Removing the same contact that we added



STEP-4

Now we can see that contact is removed successfully. But to show you the further steps I am adding that contact again

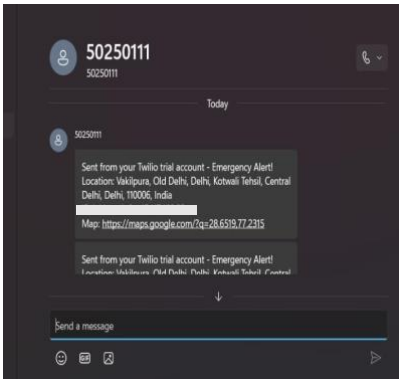


STEP-5

Now lets show you voice recognition
By our chatbot you can see bot is
Listening for help help after that
It has displayed a message detected
help

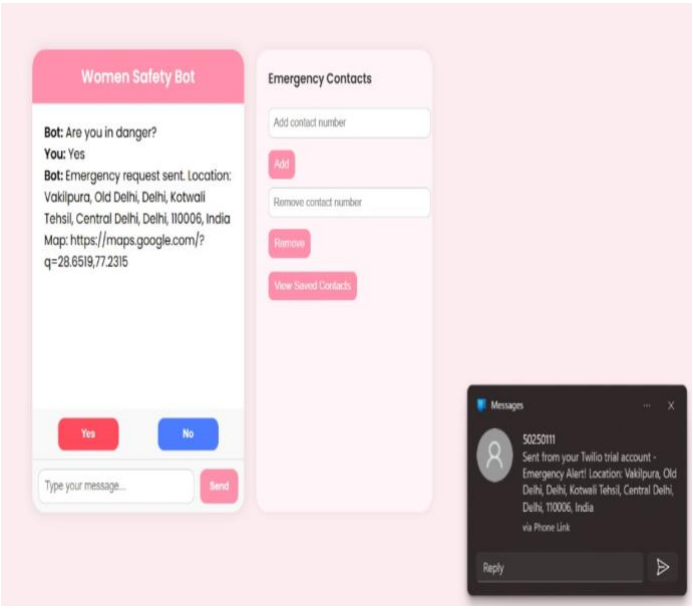
STEP-6

After that we have received the message with our exact location and google map link for tracking live location



STEP-7

This is one option to share our
Live location other option is that
We press yes button provided in
The bot and it displays location with
Google link and you can see sms also
came



STEP-8

The last thing that we have implemented groq ai llama 3 model which is handling basic responses such as here we have asked about an area that it is safe