MAP FOR PANIMALAR ENGINEERING COLLEGE WITH CHAT BOT

A Mini Project Report

Submitted by

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ABSTRACT

Navigating large college campuses can be a daunting task, especially for new students and visitors. This project aims to develop a user-friendly digital platform integrating an interactive campus map with an AI chatbot called "The PEC Map with an AI Chatbot". Users can engage in real-time, conversational interactions with the chatbot to receive accurate and instant guidance. The integration of the AI chatbot with the map enhances the user experience by providing dynamic, personalized responses based on location and specific queries. The college map will also provide a detailed layout of buildings, departments, facilities, and services, allowing users to easily locate their desired destinations.

With the increasing demand for user-friendly, efficient navigation and location-based services, the integration of Artificial Intelligence (AI) into map applications offers a transformative approach to enhancing user experiences. This project presents the development of a map application integrated with an AI-powered chatbot designed to assist users in navigating complex geographical data through natural language interactions. The chatbot enables users to ask location-specific questions, request route guidance, discover nearby amenities, and access real-time information such as traffic, weather, and local events, all within a single interface. By combining conversational AI with an interactive map, the system provides a seamless, intuitive experience, allowing users to bypass traditional, multi-step search processes. The application supports user queries and requests. Through machine learning and natural language processing (NLP), the chatbot interprets user intents and dynamically updates the map to display relevant information.

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CHAPTER 1
INTRODUCTION

The goal of the project is to develop a Map interface integrated with an artificial intelligence(AI) chatbot for seamless communication with the user interface. The Map is intended for navigating inside Panimalar Engineering College(PEC) Campus. This Map also offers the option of viewing a specific building, real-time location inside the campus, navigation in the campus in the including the shortest distance between the starting point and destination. The AI chatbot in the Map assists the user in making decisions regarding navigation. Apart from that, it also offers customized recommendations to an user for reaching a specific destination.

Our project “The PEC Map” focuses on creating a customized map for PEC with all the features to make the Map user interface user-friendly. The AI chatbot offers a conversational interface making it easier for the user tounderstand the instructions and recommendations. The Map offers spatial visualization and processes user query using natural language processing(NLP).

This Map reduces the stress and hassle for the visitors thereby saving time and energy The platform is designed to be user-friendly, regardless of the skill level, ensuring that students, faculty, and visitors can easily navigate the campus.

Additionally, the AI chatbot can provide valuable information beyond directions, such as details about ongoing campus events, department contacts, and administrative services.

1.1 OVERVIEW

A college map integrated with an AI chatbot offers an interactive and user-friendly way to navigate campus. The chatbot, powered by artificial intelligence, provides real-time assistance, guiding students and visitors to various campus locations such as academic buildings, dormitories, libraries, dining halls, and recreational areas. Users can ask for specific directions, information on facilities, or details about campus events, and the AI chatbot responds with accurate, personalized suggestions. This system enhances the overall campus experience by making navigation easier and more efficient, especially for new students or visitors unfamiliar with the layout An AI-powered chatbot integrated with a college map can offer students and visitors a seamless navigation experience around campus. The chatbot would act as a virtual guide, answering queries related to building locations, nearby amenities, and event schedules. Users could ask for directions to academic buildings, dormitories, or recreational areas, and the AI could provide step-by-step walking or driving directions. Beyond simple navigation, the chatbot could offer personalized assistance, such as identifying the nearest dining options, ATMs, or libraries based on the user's current location. It could also respond to questions about department office hours, ongoing campus events, and specific facilities. With real-time updates, the chatbot could alert users to construction areas, closed pathways, or high-traffic zones, ensuring smooth navigation Moreover, the chatbot can customize its responses based on the user's role—whether they are a student, faculty member, or visitor. For instance, a student might receive information about their specific academic department, while a visitor might be directed toward landmarks, such as a campus museum or auditorium.

1.2 PROBLEM STATEMENT:

In today's fast-paced world, navigating complex geographical data, finding relevant locations, or obtaining information about specific areas often requires multiple steps and applications. Users are typically required to manually input queries into map-based interfaces or sift through layers of data to find find the information they need. This process can be time-consuming, inefficient, and frustrating, especially for users unfamiliar with the geography or with complex use cases like planning multi-stop routes, discovering local amenities, or obtaining real-time updates about traffic, weather, or events.

There is a need for an intuitive solution that combines map-based interfaces with conversational AI to create a seamless, user-friendly experience. This integration should allow users to ask location-base questions, receiveintelligent responses, and navigate maps through natural language conversations.

CHAPTER 2
LITERATURE SURVEY

A literature survey on college maps integrated with AI chatbots explores various technologies, methodologies, and use cases that enhance campus navigation and user engagement. Key studies focus on the following aspects:

AI Chatbot Development and Navigation: Research by Palanivel & Sujatha (2021) discusses the role of AI in creating intelligent chatbots that use natural language processing (NLP) to interpret user queries and provide campus-related information. These chatbots offer personalized assistance for way finding, enhancing accessibility and ease of navigation for students and visitors.

Human-Computer Interaction (HCI): Studies such as by Gulliksen et al. (2020) investigate the design and usability aspects of AI-powered chatbots, ensuring that the interaction is intuitive. Literature emphasizes integrating user feedback and design thinking into the creation of chatbot systems to improve their utility and user satisfaction.

Location-Based Services (LBS): AI chatbots use advanced geospatial technologies, such as GPS and indoor positioning systems, to offer real-time directions. The study by Kaasinen et al. (2022) highlights how AI and LBS can work together to provide highly accurate navigation within dynamic and complex environments like a college campus.

Data-Driven Personalization: Research in AI personalization techniques, such as by Walker & Singh (2019), explores how chatbots leverage student data to offer tailored responses. For instance, chatbots can recommend study spaces or events based on a student’s schedule or preferences, enhancing the map's relevance.

CHAPTER 3
SYSTEM ANALYSIS

3.1 EXISTING SYSTEM:

There are many existing Map interfaces used for navigation. There are many downsides to a general navigation Map such as Google Maps, Waze andHere we go.

Google Maps is designed for general public use and may not have specific campus details, such as indoor maps for college buildings or precison facilities like classrooms, offices, or event venues.

WAZE is primarily a driving focused map not useful for walking directions or indoor navigation, which are inevitable on most college campuses.

3.2 PROPOSED SYSTEM:

Interactive Digital Campus Map

The system will feature a detailed, interactive map of the entire college campus, accessible on any device.

AI-Powered Chatbot

The AI chatbot, integrated with the map, will provide real-time, conversational assistance to users.

User-Friendly Interface

A simple and intuitive interface for both the map and chatbot, allowing users of all skill levels to navigate the system easily.

Customized Maps for College

Our project aims to create a custom and tailor-made college map for the visitors to reduce their daily hassle.

CHAPTER 4

SYSYEM DESIGN

4.1 UML DIAGRAMS:

Fig:3.1usecasediagram

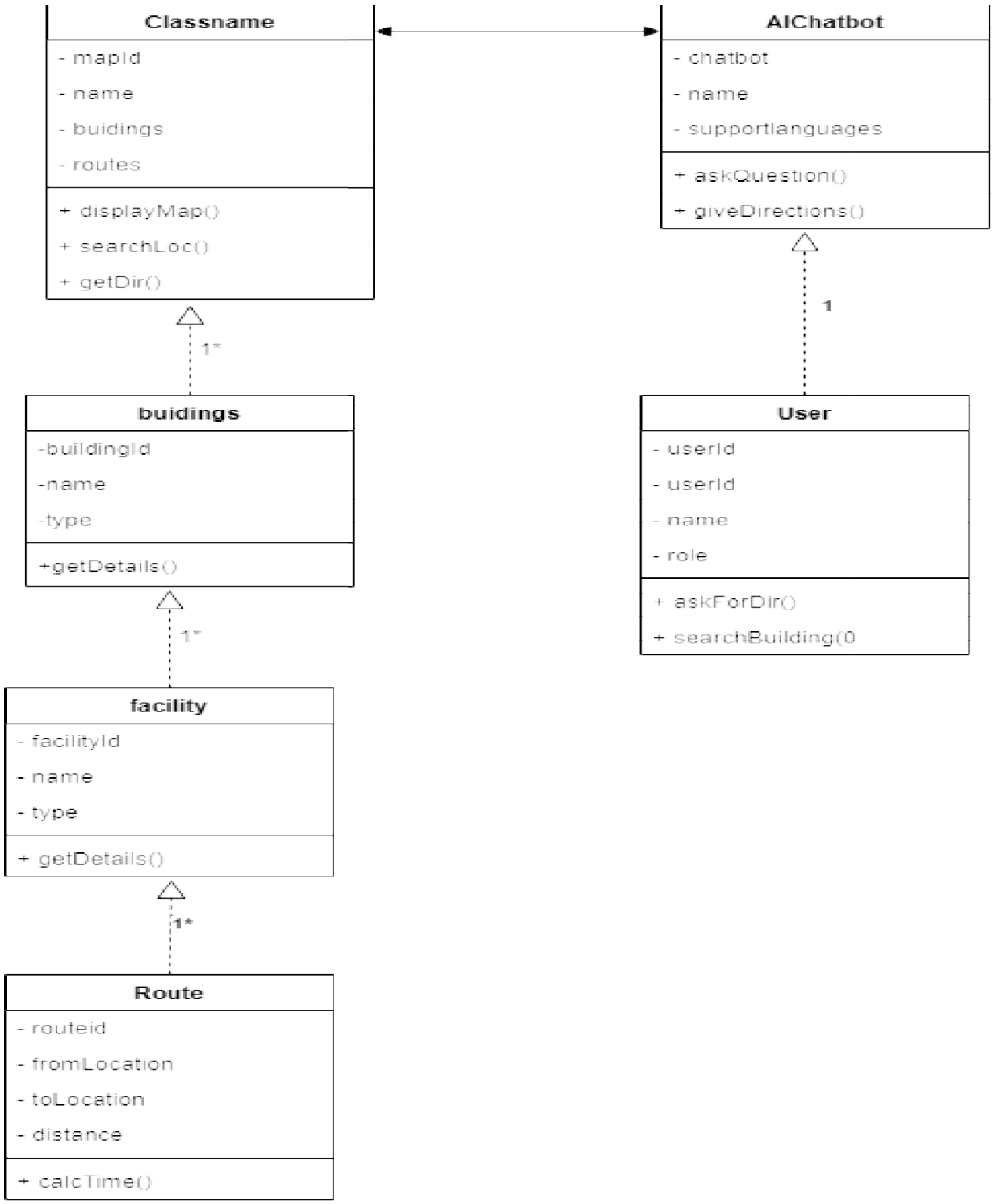

Fig:3.2 class diagram

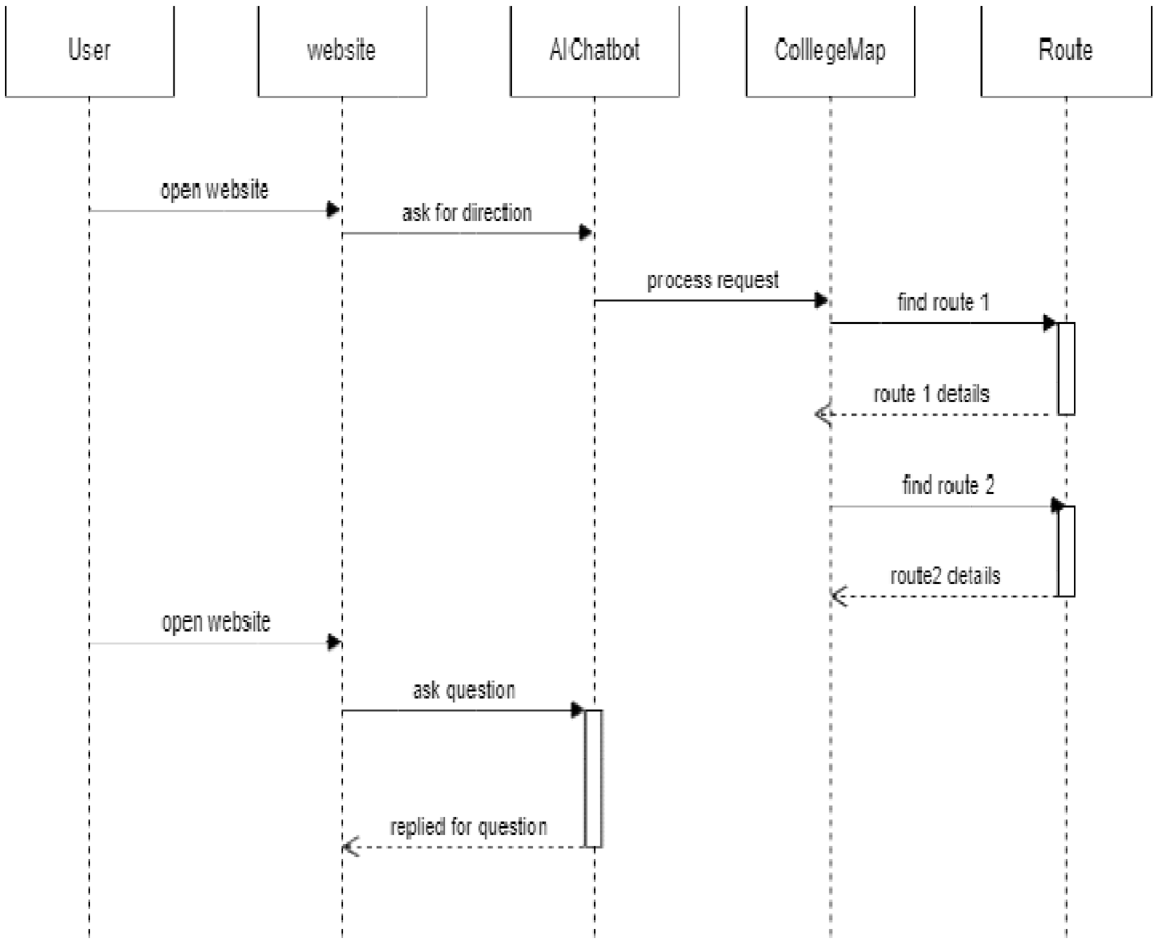

Fig: 3.3 sequence diagram

The sequence diagram details the steps involved from opening the Map to using it and closing the Map.On the user's request to the AI Chatbot for directions, it retrieves the data from the database

4.2 TECHNOLOGY STACK:

4.2.1 MATERIALS:

Mapping Tools:

Mapbox API or OpenStreetMap API: For generating the college map.

Leaflet.js: A JavaScript library for interactive maps.

Geolocation Data: To accurately map the locations of various buildings

AI Chatbot Platform:

Dialogflow, Botpress, or any other chatbot framework.

Natural Language Processing (NLP) Models: Models like GPT-3, GPT-4, or BERT for better conversational capabilities. Programming Language: Used Python or JavaScript for chatbot development.

Data Sources:

College Database: Information on departments, building locations, campus services, etc.User Interaction Data: FAQs, common queries, or user experience data to fine-tune and train the chatbot's responses.

Frontend Development Tools:

HTML, CSS, JavaScript: For designing the user interface and embedding the map

Backend Development Tools:

Node.js, Django, or Flask: For handling backend logic and communication with APIs.

Database: SQL, NoSQL, or Firebase to store location data, building details, or user logs.

Hosting Platform:

Cloud Services: AWS, Google Cloud, or Microsoft Azure to deploy both the map and chatbot.

Server: For the backend and API management (if needed)

4.2.2 METHODS:

Map Creation:

- Data Collection: Collect detailed geospatial data of the campus, including all important landmarks like buildings, parking, libraries, and cafeterias.

- API Integration: Use Mapbox API or OpenStreetMap to overlay the campus buildings. Customize map markers to highlight important locations.

- Interactive Features: Integrate popups or tooltips that give additional details when users click on certain locations (building descriptions, office hours, etc.).

Chatbot Development:

- Defining Scope: Specify what the chatbot needs to handle (e.g., directions, building info, department contacts, etc.).

- Training Data: Use existing FAQs or collect common queries related to campus navigation and services to train the chatbot.

Integration:

- Frontend and Backend Communication: Ensure the chatbot can pull and send data to the map interface. For instance, if a user asks for a location, the chatbot should display the coordinates or highlight the location on the map.

- User Experience Optimization: Implement features like voice command for accessibility, route suggestions (walking paths, shortest route), or even integrations with other systems like campus schedules or event calendars.

-

CHAPTER 5

SYSTEM ARCHITECTURE

5.1 DESCRIPTION OF THE COMPONENTS:

5.1.1 Map Interface System:

The user interface system involving the Map interface is displayed onto the user. “The PEC Map” contains a lot of features and actions present in it to ensure the smooth workflow of the system. Let’s delve deeply into the components of the Map Interface System and their specific functions.

Key Components:

- **Open Map:**

  The system starts with the user or system triggering the opening of a map interface. This is the most important step of a GIS-based application or website service system that provides geographical or navigational services.

- **Display Map Interface:**

  After the map is opened, the interface presents various controls such as zoom, pan, search, and other navigation tools for the user to interact with the map. It shows the geographical data and locations.

- **Navigation of Map:**

  The user can navigate through the map using various controls such as zooming, dragging, or clicking. This component provides the core interaction tools for moving through and exploring the map.

- **Map Action:** Once the user has navigated to a specific area, there are multiple actions available, such as:

- **Zoom:** Allows the user to zoom in and out of specific areas.
- **Click:** The user can click on a location, and it will trigger further actions, such as identifying a point of interest (POI).
- **Search:** Users can input specific queries, like addresses, and the map will locate those places.

Display Results:

After the user performs any actions (e.g., search or click), the results of those actions are displayed. This could be information about a location

points of interest, or any spatial data relevant to the user's request and also additional information suchas nearby places of interest

Close Map:

This component closes the map interface once the user is done navigating through the Map interface, thus ending their session with the map system.

5.1.2 AI Chatbot System:

"The PEC Map" also has a built-in feature of an AI chatbot with the Map. The AI Chatbot is used to give directions and recommendations to the user for seamless and carefree navigation inside the college campus.

Key Components:

Open AI Chatbot:

The user initiates interaction with an AI chatbot. This happens via a dedicated chatbot interface or by clicking on an AI assistant icon

Input Query:

The user types or speaks a query into the chatbot. This could be a specific request such as asking for directions, information about a place, or even questions about geographic data.

Query Processing:

The AI processes the input, parsing the natural language query, interpreting what the user is asking, and possibly interacting with back-end systems (like the map database or other external data sources) to retrieve relevant information.

AI Chatbot Response:

Based on the processed query, the AI provides a response. This could include text-based answers, suggestions or recommendations, or additional queries for clarification.

Map Visualization of the Response:

If the chatbot's response includes spatial or location-based information, it can display the results directly on the map interface. For instance, if a user asks for directions or places of interest, the chatbot will return results as markers or paths on the map.

5.1.3 Integration Between Map Interface and AI Chatbot:

Interaction Flow:

User Interaction with Map:

- The user starts by interacting with the map system. They may perform actions such as searching for locations, zooming, and clicking on points of interest.
- Results of these actions are displayed in the map interface.

User Query via AI Chatbot:

- While using the map, the user can initiate a conversation with the AI chatbot to ask for further information or clarification. For instance, a user can ask the AI for directions, place information, or traffic data.

AI Response on Map:

- Once the AI chatbot processes the user’s query, it may display additional data on the map, such as paths, directions, or location markers, based on the user's input. This enhances the user's interaction with both the chatbot and the map interface**.**

Final Interaction:

- After the user has received both map and chatbot responses, they can close the map, ending their interaction with the system.

An illustration of the userflow interaction diagram is explained in the form of a flowchart given below.

This flowchart explains the sequence of actions taking place starting from the opening of the Map to navigation till the closing of the Map.

5.2FLOWCHART

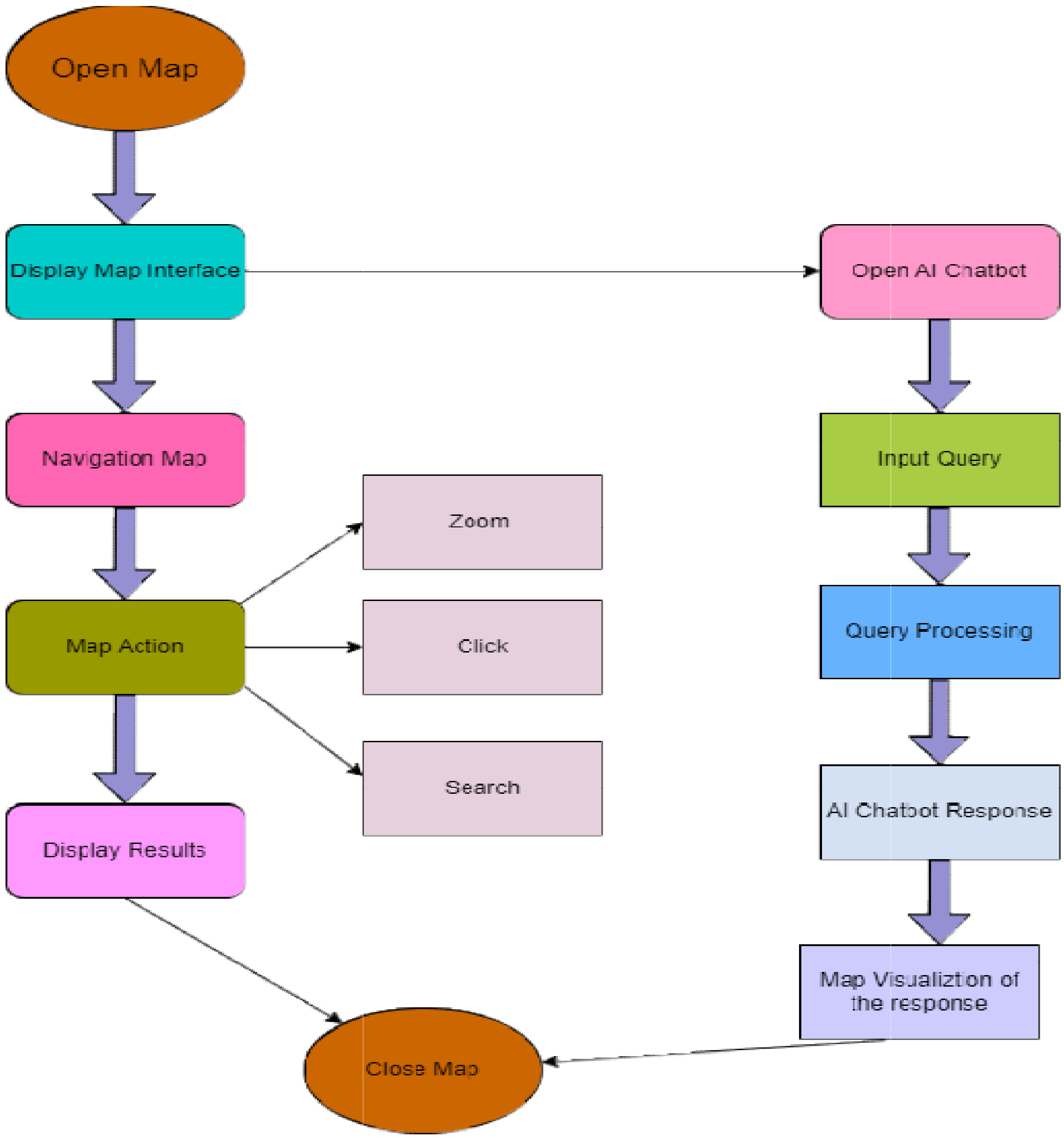

Figure 5.4 flowchart

5.3 ARCHITECTURE OVERVIEW:

5.3.1 proposed methodology:

The architecture of "The PEC Map " is designed in such a way that it influences its performance and efficiency. An overview of the proposed architecture is given below.

User Interface (UI) Layer:

Map Interface:
A web or mobile-based UI that provides users with a visual map interface where they can interact with geographical data. Users can perform map actions such as zooming, panning, searching, and clicking on map features.

Chatbot UI:
A chat window or a voice input system that allows users to input queries in natural language. This is typically integrated into the map interface or accessible as a floating window.

Event Handlers:

Click Event Handler: Detects when the user clicks on the map and sends this action to the back-end system for processing.

- **Zoom Event Handler:** Captures zoom actions and updates the map's scale accordingly.
- **Search Event Handler:** Takes input from the search bar and forwards the query for further processing.

API Gateway (Integration Layer)

Acts as a central point where all the client-side requests are routed to their respective services (Map Service and AI Service).

Backend Services

Map Service:

Map Data Server:

Stores and serves geographical data to the client. This can be a tile- based service (like Google Maps or OpenStreetMap) that provides map tiles and other spatial data.

Geocoding Service:

Converts user input (like addresses or place names) into geographical coordinates. When the user inputs a query in the search bar, this service retrieves relevant map coordinates and passes them to the map interface.

Map Actions Processor:

Receives and processes user actions like zoom, click, and search, and generates responses based on the map's state and the user's input. It communicates with the Map Data Server and returns visual data (new map tiles, POI markers, etc.) back to the front-end interface.

AI Chatbot Service:

Natural Language Processing (NLP) Engine:

This component is responsible for parsing and interpreting user queries. It converts text input into machine-readable instructions.

AI Query Processor:

Based on the user's query, this module decides the type of response required, whether it's a map visualization or a text-based response..

Map Database:

Stores map data such as geographical coordinates, addresses, POIs (Points of Interest), etc. This data is queried by both the Map Service and the AI Chatbot for actions like search or location identification..

External APIs (Optional)

External Data Sources:

These could include APIs from third-party services such as traffic updates, weather data, or additional geographical data sources. These APIs provide supplementary data for enriching the map visualization and chatbot responses.

Response Integration

Once the chatbot has processed the user's query (e.g., "Find parks nearby"), it calls both the **NLP engine** and the **Map Service** to retrieve the correct data.The map service returns visual data (location markers, routes, etc.), which is displayed on the map interface, while the chatbot might return a textual response (e.g., "I found 3 parks near your location")

CHAPTER 6

SYSYTEM IMPLEMENATION

Coding:

HTML

```
<!DOCTYPE html>

<html lang="en">

<head>

  <meta charset="UTF-8">

  <meta name="viewport" content="width=device-width, initial-scale=1.0">

  <meta http-equiv="X-UA-Compatible" content="ie=edge">

  <script src='https://api.mapbox.com/mapbox-gl-js/v1.12.0/mapbox-
gl.js'></script>

  <link href='https://api.mapbox.com/mapbox-gl-js/v1.12.0/mapbox-gl.css'
rel='stylesheet' />

  <script src="https://api.mapbox.com/mapbox-gl-js/plugins/mapbox-gl-
directions/v4.1.0/mapbox-gl-directions.js"></script>

  <link
    rel="stylesheet"
    href="https://api.mapbox.com/mapbox-gl-js/plugins/mapbox-gl-
directions/v4.1.0/mapbox-gl-directions.css"

    type="text/css"
```

```
  />

  <title>Google Maps Clone</title>

  <style>
    body {
    margin: 0;
    }

    #map {

      height: 100vh;
      width: 100vw;
    }

  </style>

  <script src="script.js" defer></script>

</head>

<body>

  <div id='map'></div>

</body>

</html>
```

JAVASCRIPT

```
mapboxgl.accessToken =
 "pk.eyJ1IjoicmFqY2hha3JhIiwiYSI6ImNtMmJ5cmE5dDB6dXQybHF3dDBq
OTViY3gifQ.KhOi7z7Jx-pU_I1F4NRnlw"

navigator.geolocation.getCurrentPosition(successLocation, errorLocation, {
  enableHighAccuracy: true
})

function successLocation(position) {
  setupMap([position.coords.longitude, position.coords.latitude]


function errorLocation() {
setupMap([-2.24, 53.48])

}

function setupMap(center) {

  const map = new mapboxgl.Map({
    container: "map",
    style: "mapbox://styles/mapbox/streets-v11",
    center: center,
    zoom: 15

  })
```

```
const nav = new mapboxgl.NavigationControl()
map.addControl(nav)
var directions = new MapboxDirections({
  accessToken: mapboxgl.accessToken
})

map.addControl(directions, "top-left")
```

CHAPTER 7
REPORTS/PERFORMANCE ANALYSIS

7.1 SYSTEM TESTING

MODULE 1: Map Interface

TEST CASE	TEST CASE DESCRIPTION	STEPS	RESULT	STATUS
1.	Loading of map	1) Click on the application or website url. 2) Check the time taken to load the map.	Map interface is displayed when you click on the link within seconds.	Pass
2.	Routing	1) Search a route to commute between two locations.	The distance or route is highlighted between the two points.	Pass

MODULE 2: AI Chatbot

TEST CASE	TEST CASE DESCRIPTION	STEPS	RESULT	STATUS
1.	Inputting a query	1) Click on the AI Chatbot to input your query. 2) Check the responsiveness of the Chatbot.	The AI Chatbot reads the user's query and provides a response to it.	Pass
2.	Query handling	1) Ask for directions and recommendation from the AI Chatbot	The AI Chatbot provides personalized routes and suggestions to	Pass.

7.2 Evaluation Parameters

7.2.1 Map Performance Metrics

Map Load Time

Objective: Evaluate how quickly the map loads and becomes interactive.

Key Metrics:

Time to First Paint (TTFP): Time it takes for the first elements of the map (such as tiles or markers) to appear.

Time taken to Interact (TTI): Time for the map to become fully interactive for users (i.e., users can zoom, pan, click on markers).

Tile Loading Time: Time taken to load all the map tiles, especially as users pan or zoom.

Map Interactivity and Responsiveness

Objective: Ensure smooth interactions with the map (panning, zooming, marker clicks).

Key Metrics:

Interaction Latency: Measure the delay between user actions (e.g., clicks, zooms) and the system's response.

FPS (Frames per Second): Higher FPS ensures smooth map interactions, especially during animations (e.g., moving between locations).

Map Controls Responsiveness: Test how quickly map controls (zoom, rotate) respond.

Routing and Directions Accuracy

Objective: Analyze the accuracy of the map when users request directions from one block to another.

Key Metrics:

Route Calculation Time: Time taken for the system to compute and display the route between two points.

Route Accuracy: Measure how accurately the system generates directions based on the actual layout of the campus.

7.2.2 AI Chatbot Performance Metrics

Chatbot Response Time

Objective: Ensure that the chatbot responds to user queries quickly.

Key Metrics:

Average Response Time: Time taken for the chatbot to understand the user query and provide a response.

Response Latency Under Load: Analyze chatbot performance under heavy traffic or multiple concurrent queries.

Accuracy of Query Handling

Objective: Evaluate the chatbot's ability to correctly understand and respond to user queries related to the campus map.

Key Metrics:

Intent Recognition Accuracy: Percentage of queries where the chatbot correctly identifies the user's intent (e.g., asking for directions).

Entity Recognition Accuracy: Ability of the chatbot to accurately identify campus-specific entities (e.g., names of buildings, classrooms).

Error Rate: The percentage of queries where the chatbot provides incorrect or irrelevant responses.

Natural Language Understanding (NLU) Model Efficiency Objective: Assess the efficiency of the NLU model powering the chatbot. Key Metrics:

Inference Time: Time taken by the NLU model to process the user's query and extract intents and entities.

Scalability: Ensure the NLU model can handle an increasing number of users without significant drops in performance.

7.2.3 System-Level Performance Metrics

Concurrency Handling

Objective: Test how well the system handles multiple users accessing the map and chatbot simultaneously.

Key Metrics:

Concurrent Users Supported: Number of users the system can handle simultaneously without performance degradation.

Throughput: Measure the number of successful interactions processed per second

Latency Under Load: Analyze how response times (for both map and chatbot) change as the number of concurrent users increases.

Scalability and Load Testing

Key Metrics:

Elastic Scaling: Test the system's ability to scale resources dynamically as user load increases.

Peak Load Performance: Measure system performance during high-traffic periods.

Uptime and Reliability

Objective: Ensure the system remains available and reliable for users. Key Metrics:

Uptime Percentage: Percentage of time the system is operational (e.g., 99.9% uptime).

Mean Time to Failure (MTTF): The average time the system operates without failure.

Mean Time to Recovery (MTTR): The time taken to restore service after a failure.

7.2.4 User Experience (UX) Performance Metrics

User Engagement with the Map and Chatbot

Objective: Assess how users interact with the map and chatbot.
Key Metrics:

Session Duration: Average time users spend interacting with the map and chatbot.

Bounce Rate: Percentage of users who leave without interacting or quickly exit the system.

Chatbot Engagement Rate: Percentage of users who initiate conversations with the chatbot.

User Satisfaction and Error Rate

Objective: Ensure a positive user experience by minimizing errors and maximizing satisfaction.

Key Metrics:

Error Rate: The percentage of interactions where users encounter issues (e.g., incorrect directions, chatbot failures)

Customer Satisfaction Score (CSAT): Measure user satisfaction with the map and chatbot interaction.

Task Completion Rate: The percentage of users who successfully complete tasks (e.g., finding directions, locating buildings).

7.2.5 Security and Data Privacy

Security Analysis

Objective: Ensure the system is secure and user data is protected.

Key Metrics:

Data Encryption: Ensure all communications between the map, chatbot, and users are encrypted (e.g., using HTTPS).

Vulnerability Scanning: Regularly scan the system for security vulnerabilities such as SQL injection, XSS, etc.

Compliance with Data Privacy Regulations: Ensure the system adheres to privacy laws like GDPR or FERPA.

CHAPTER 8

CONCLUSION

8.1 conclusion

In conclusion, integrating AI chat bots into the college map system presents numerous advantages. It enhances user experience by providing real-time, interactive guidance, facilitating smoother navigation for students and visitors. The technology's ability to offer personalized assistance ensures that users' specific needs are met promptly, contributing to a more accessible and efficient campus environment. Furthermore, the data collected through AI interactions can be utilized to improve campus facilities and services continuously. Embracing AI chat bots is not just an innovative step but a practical one that aligns with our commitment to leveraging technology for a better academic experience.

Moreover, the continuous data collection and analysis capabilities of the AI chat bot enable the institution to gain valuable insights into user behavior and needs. This data-driven approach can inform future enhancements, ensuring that the campus evolves in line with the requirements of its community. By integrating advanced technology into the college map system, the institution demonstrates its commitment to embracing modern solutions that improve operational efficiency and user satisfaction.

Ultimately, the AI chat bot represents a forward-thinking strategy that aligns with the institution's mission to leverage technology for the betterment of the academic experience. It underscores a proactive stance in addressing the complexities of campus navigation and reaffirms the college's dedication to fostering an inclusive, efficient, and technologically advanced environment.

AI chat bots can enhance the user experience of college maps. They can provide personalized recommendations, answer questions, and assist with navigation.AI chat bots can help students find information more efficiently. They can search databases of campus resources, events, and academic programs.

Integrating a college map with an AI chat bot offers an innovative and interactive way for students, faculty, and visitors to navigate the campus with ease. By combining real-time location services with personalized assistance, the chat bot can provide directions, building information, and event details while adapting to the user's specific needs. This seamless fusion of technology enhances the campus experience by reducing confusion, improving accessibility, and promoting efficiency. As AI continues to evolve, the potential for expanding these capabilities—like integrating academic resources or personalized tour suggestions—promises to make campus life more connected and user-friendly.

8.2 Future Enhancements:

Augmented Reality (AR) Integration: Users could access an AR view through their smart phones, where the AI chat bot provides real-time directions and overlays useful information on campus landmarks, helping users visually navigate their environment.

Personalized Recommendations: The chatbot could offer tailored suggestions based on user preferences, such as study spots, nearby amenities, or events related to their academic or extracurricular interests.

Sustainability and Accessibility Features: The system could include eco-friendly route suggestions, like walking or cycling paths, and ensure ADA-compliant navigation, guiding users through wheelchair-accessible entrances or paths.

Personalized Recommendations: The chatbot could offer tailored suggestions based on user preferences, such as study spots, nearby amenities, or events related

to their academic or extracurricular interests.

Sustainability and Accessibility Features: The system could include eco-friendly route suggestions, like walking or cycling paths, and ensure ADA-compliant navigation, guiding users through wheelchair-accessible entrances or paths.

Crowdsourced Feedback and Collaboration: Students and staff could contribute by submitting feedback or reporting inaccuracies, allowing the AI system to improve its data and provide better, more accurate guidance.

Integration with Academic Resources: The AI chatbot could link directly to course schedules, library catalogs, or tutoring services, allowing students to not only find buildings but also access academic resources on the go.

Social Features: Community building: The chatbot could be used to connect students with each other and campus resources .Event planning: The chatbot could help students plan and organize campus events

Enhanced understanding of context: The chatbot could better understand the context of a conversation, allowing for more nuanced and relevant responses.

SAMPLE SCREENSHOTS:

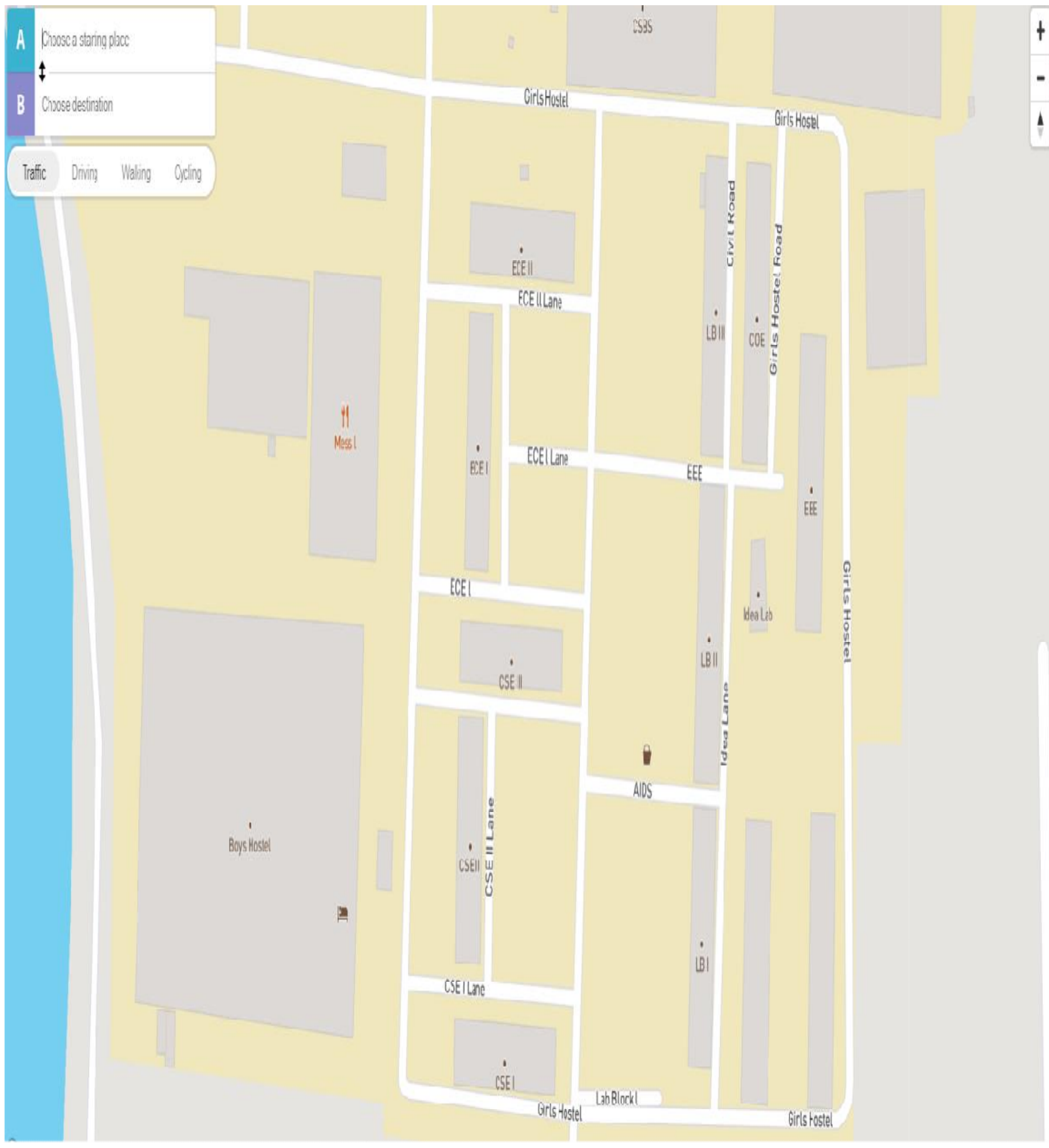

Figure 9.5 map

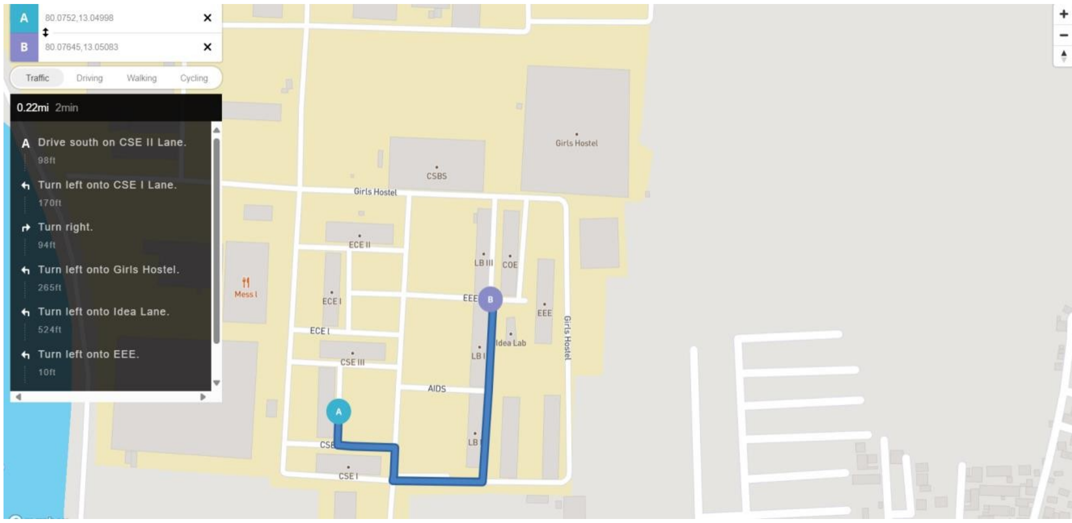

Figure 9.6 direction of map

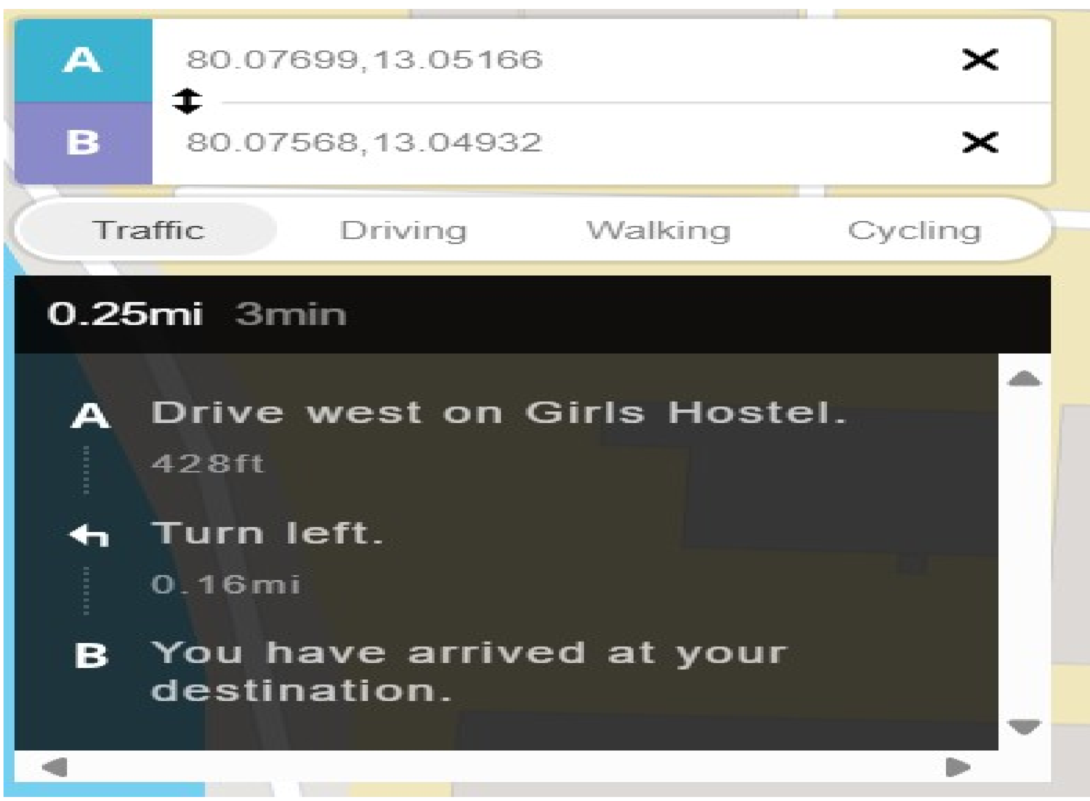

Figure 9.7 direction of map

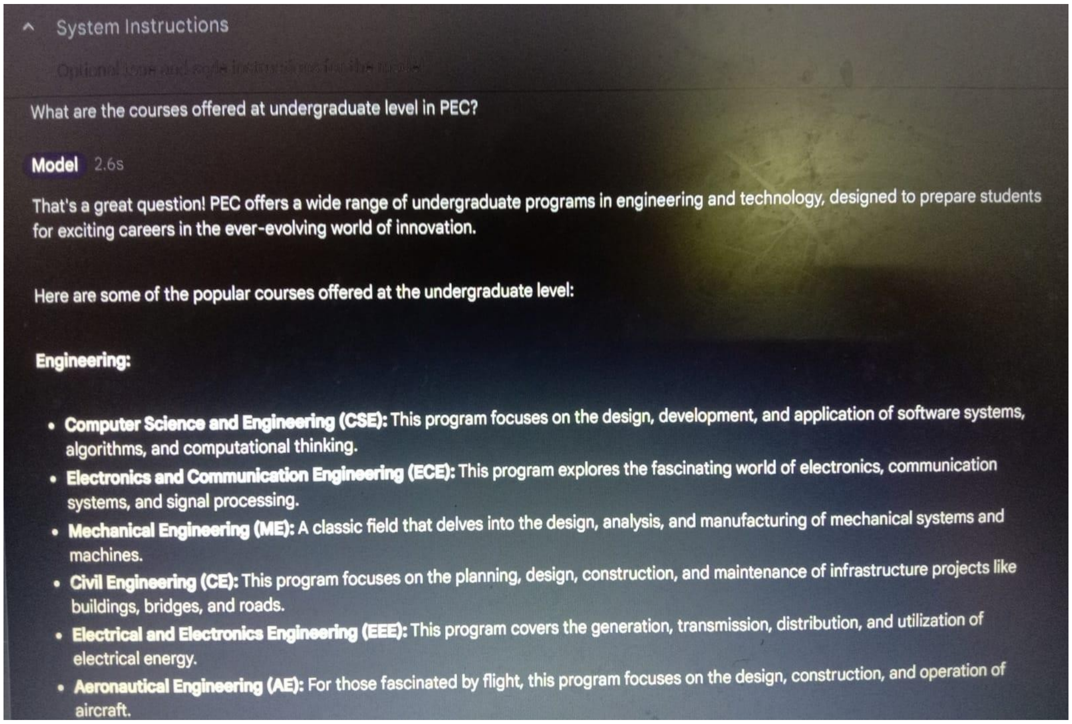

Figure 9.8 Ai chatbot

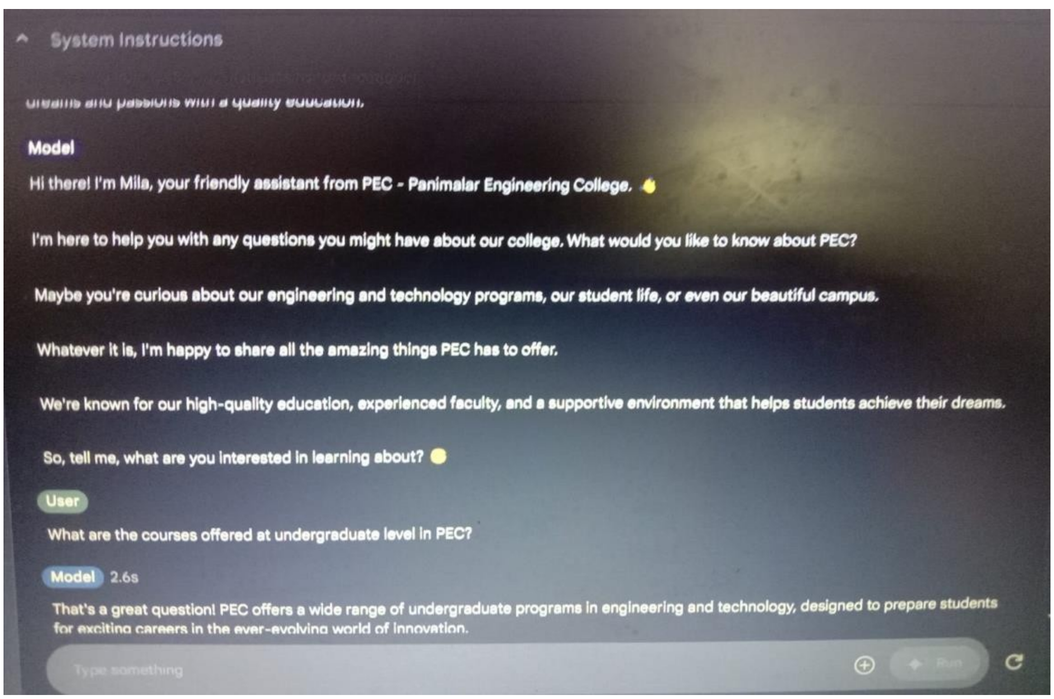

Figure 9.9 Ai chatbot

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