Literature Review

CSNAVBOT

- Lai Ke Wei
- Reem Idres
- Ibtism Gul
- MD Raffaul Islam
- Azizar Mohammad Sadmam Sobhan
- Surayia Rahman

Voice-based Mobile Application for Indoor Navigation (Fernando G.S., 2019)

GuideMe App: IBM Watson-powered mobile app for indoor navigation at IBM Madrid using voice/text input

- Location Services: Utilizes updated internet-connected services to overcome the limitations of traditional maps, focusing on indoor navigation challenges.
- IBM Watson Integration: Employs IBM Watson's cognitive services for improved voice recognition and processing.
- Voice/Text Input: Users can interact with the app using both voice and text inputs.

Buvana et al. (2021)

Deep Learning Based Campus Assistive Chatbot

- Aim of Work: To implement a web-based chatbot named EVA for a college website, enhancing accessibility and user experience.
- EVA integrates features like natural language processing, campus navigation via Google Maps, and a menu of frequently used links
- Success: achieving an efficiency rate of 89% and providing concise answers and relevant information to users' queries.

Dimo, Goodman & Jansen van Vuuren, J.C. & Jansen van Vuuren, Anna-Marie. (2022). Using a Smart Chatbot System as a Communication Tool for Campus Navigation.

1. Hybrid Technology: Utilizes both natural language processing (NLP) and image processing to enhance navigation accuracy.
2. Multimodal Interaction: Supports text inputs and image uploads for location determination.
3. High Accuracy: Achieves 75% accuracy in identifying correct locations, indicating effectiveness.

UniBS4All: A Mobile Application for Accessible Wayfinding and Navigation in an Urban University Campus (2018)

Alberto A., Simone B. ,Francesca Brignoli

- The project aims to improve campus accessibility through a mobile application that customizes navigation paths.
- Tailors routes for individuals, accommodating various transportation modes including walking, driving, and public transit.
- Utilizes Google Maps API and Google Directions API.

Internal Navigation and Crowd Management System for a University

Piyumantha H. P. A. H; Prabhash, D V, S; Weerasinghe, T K; Weerasiri R. T. K; De Silva, D I. International Research Journal of Innovations in Engineering and Technology;

1. **Challenges: Navigating campuses is difficult for newcomers; an integrated system providing location-based service information and personalized recommendations is needed.**

2. **Proposed Solution: A system using:**
   - **Bluetooth Beacons: For accurate user location.**
   - **Augmented Reality (AR): For interactive navigation.**
   - **Object Detection: For real-time crowd density data.**
   - **Natural Language Processing (NLP): For user-friendly, personalized interactions.**

3. **Goal: To enhance navigation and crowd control in universities by integrating advanced technologies.**

Dsouza, Rebecca & Sahu, Shubham & Patil, Ragini & Kalbande, Dhananjay. (2019). Chat with Bots Intelligently: A Critical Review & Analysis. 1-6. 10.1109/ICAC347590.2019.9036844.

- Bot Interaction Dynamics: Examines chatbots' ability to understand and respond to human language, leveraging advancements in natural language processing.
- Ethical Considerations: Discusses privacy, algorithmic bias, and developer accountability in the context of intelligent chatbots.
- Future Trends & Challenges: Explores upcoming trends like multimodal interactions and emotional intelligence in chatbots, addressing key challenges in AI-driven development

Techniques Used

CSNAVBOT

Keyword based NLP

Keyword-based NLP involves analyzing and extracting important words or phrases from text to understand its meaning or context. These keywords serve as fundamental units for tasks like text summarization, sentiment analysis, or information retrieval.

System Flow

- In this NLP-based project, we'll employ keyword extraction to parse user inputs for course codes, locations, and events.
- Using natural language understanding, the chatbot will analyze these keywords to determine the user's intent and provide navigation guidance to lecture halls or event information based on the extracted context.
- Additionally, event-related queries will trigger the chatbot to generate links to the main website for further details, leveraging keyword-based retrieval for relevant information dissemination.

CSNavBot ARCHITECTURE

1. Frontend Interface

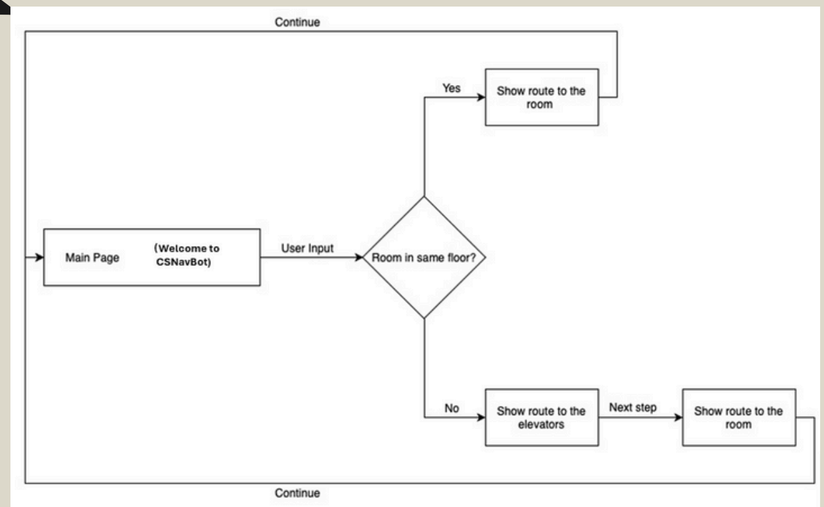
- Develop a basic frontend interface using HTML, CSS, and Python
- Users can input queries and receive responses from the chatbot
- Responses from chatbot include: direction to the classrooms and the latest events details

2.Chatbot Backend

- Create a lightweight backend server using a Flask framework.
- Implement basic natural language processing (NLP) functionalities like text summarization, sentiment analysis, and information retrieval to process user queries and generate responses

3. Database

- Use Google Sheets as the primary database for your chatbot application.
- Organize data into different sheets within the Google Sheets document, with each sheet representing a different type of information (e.g., class schedules, events, FSKTM map)
- Retrieve data from the Google Sheets document based on user queries to generate responses



4. User Feedback Mechanism

- Implement a basic feedback mechanism within the app to allow user make a report if they face any problem.

5. Deployment

- Localhost

6. Documentation

- A simple documentation will be created to guide users on how to use the chatbot

7. Ethics

- Transparency and Trustworthiness
  - Be transparent with users about how their data is collected, used, and stored within the chatbot application.
  - Provide clear and understandable explanations of the chatbot's capabilities, limitations, and data processing practices to build trust with users.
- Accountability and Oversight
  - Provide channels for users to report ethical or privacy issues and take prompt action to address and resolve any identified problems.