

AI ML PROJECT :WEEK 1 REPORT

TITLE

NAVIBOT: Intelligent Campus Navigator for Chanakya University.

ABSTRACT

NaviBot is a chatbot-based system designed to simplify navigation across the University campus. By modeling campus buildings and paths as a graph and integrating classic search algorithms, the system interacts with students and visitors to provide optimal routes and location details, which enhances campus accessibility and reduces confusion.

INTRODUCTION

Navigating a large university campus can be challenging, especially for new students and visitors. Locating classrooms, offices, and facilities under time constraints often leads to delays, missed appointments, and unnecessary stress. Current solutions like paper maps are static and do not offer context-aware assistance.

An intelligent digital with efficient search algorithms can efficiently address these challenges, providing users with instant directions and facility details.

PROBLEM STATEMENT

Students and visitors frequently struggle to navigate the university's extensive campus. The absence of a interactive navigation system results in delays, missed classes, and frustration. Without real-time guidance, users face challenges in locating buildings and accessing up to date facility information. This leads to inefficiency and limits the overall campus experience for students and visitors.

OBJECTIVES

- Designing and developing a graph-based campus navigation system for Chanakya University.
- Modeling campus buildings and pathways to enable optimal route finding.
- Implementing search algorithms like BFS, DFS, UCS, and A* to identify the shortest paths.
- Providing building and facility information through an interactive chatbot.
- Enhancing student and visitor experience by reducing navigation time and confusion.

SCOPE

In Scope:

- Mapping campus buildings and walkable paths as a weighted graph.
- Implementing BFS, DFS, UCS, and A* algorithms for campus navigation.

- Delivering building level information (ex : department, services, operational hours) through the chatbot.
- Creating a text-based interface for user queries.

Out of Scope:

- Room-level indoor navigation.
- External campuses or locations beyond Chanakya University.

DATA REQUIREMENTS

- Campus Map: A digital representation of the campus layout.
- Location Data (Graph Nodes): A list of all key locations on campus, including:
 - Main Gate
 - Flag post
 - Admin block and academic block 1
 - Auditorium
 - Library
 - Cafeteria
 - Registrar office
 - Academic block 2
 - Food court
 - Sports complex
 - Cricket ground
 - hostel
- Path Data (Graph Edges with Weights): Connections between locations with corresponding distances (weights). This will be extracted from the provided map image.
- Department Details: Information about offices, services, and contacts within each building .
 - Departments in Admin block :
 - School of Art, humanities and social sciences
 - School of management sciences
 - School of mathematics and natural sciences
 - School of law , governance and public policy
 - Departments in Academic block 2 :

FAQs: A list of frequently asked questions and their answers related to campus navigation and services, for example :

- How do I get from Main Gate to the Library?
- What is the shortest route from Academic Block 2 to the Canteen?
- Can you show me alternative routes from the Main Gate to the hostel?
- Are there any one-way paths on campus I should know about?
- How long does it take to walk from the Hostel to the Auditorium?

TOOLS & TECHNOLOGY LIST

Core Technologies

- Language used: Python
- Frontend/UI Framework: One of the following will be selected:
 - Streamlit: For building interactive web applications using Python
 - Dialogflow: For building intelligent conversational agents with natural language understanding.
- Search Algorithms:
 - Depth First Search (DFS)
 - Breadth First Search (BFS)
 - Uniform Cost Search (UCS)
 - A*
- Database : A simple database (MYSQL) to store location and path information.