

----Chanakya University----

BotBrain Project (Week- 1)

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Title

Smart Campus Guide for Chanakya University

Abstract

This project is to develop an intelligent digital guide to assist students, professors, and visitors in navigating the Chanakya University campus. It will model the campus as a graph of buildings and walkways, and employ AI search algorithms (BFS, DFS, UCS, A*) for pathfinding. It will give directions to key locations such as classrooms, hostels, library, canteen, and offices. The objective is to make campus navigation easy, fast, and efficient.

Introduction

Massive university campuses are a maze, particularly to new visitors. Conventional maps or boards don't always make sense, and Google Maps and similar apps typically don't display campus-level information. This project addresses developing a smart campus navigation system that is capable of directing individuals to their destinations by determining optimal routes.

Problem Statement

The Chanakya University campus has many academic and non-academic buildings. Students and visitors often waste time finding the right location. Current solutions like asking people or looking at maps are not efficient. Therefore, there is a need for an intelligent and interactive system that can show the shortest route between buildings.

Objectives

- To Create a graph model of the campus layout.
- To Implement pathfinding algorithms (BFS, DFS, UCS, A*) for route finding.
- To Enable users to pick a source and destination point.
- TO Create a simple chatbot-type interface for convenient interaction.
- To Compare the performance of various search algorithms.

Scope

- The system will support at least 12 principal buildings (hostels, classrooms, library, labs, canteen, administration, auditorium, etc.).
- Users can select a source and destination to receive navigation assistance.
- The project has been restricted to Chanakya University campus only.
- Future scope: Can be enhanced with GPS or mobile app assistance.

Requirements:

Functional Requirements

- Users can choose a source and destination.
- System applies selected algorithm (BFS/DFS/UCS/A*) to determine the path.
- Show the path and the distance clearly.
- Give basic information about each building (name, type, purpose).

Non-Functional Requirements

- Easy to use with clear interface.
- Must provide results quickly.
- Should provide possibility to add new buildings/paths in the future.

Data Requirements

Map of the campus with buildings and walkable paths.

Information about the buildings such as name and category .

Important Location points :

a. University Entry Gate b. Main Security Gate c. Auditorium d. Library e. Admission Block f. Registrar Office g. Finance Department h. Cafeteria i. Lodge j. Academic Block 2 k. Staff Room AB2 l. Food Court m. Hostel Building 1 n. Stationary Shop o. Cricket Ground

Literature Review

Navigation apps such as Google Maps are strong but are not indoor or campus-level navigation. Most current systems only give directions and do not offer users a way to select varied pathfinding algorithms. Studies have proven that BFS, DFS, UCS, and A* are useful for computing shortest paths in graphs. The project integrates these algorithms with a basic user interface to create a campus-specific smart guide.

Tools & Technologies Finalized

- Python – for pathfinding algorithms.
- Flask / Tkinter / PySimpleGUI – for desktop/web interface.
- GitHub – for version control and project management.