EagleNAV
Software Design Document

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Contents

Version History

User	Date	Reason for Changes	Version
Jesse Saroca	12/5/25	Update for snapshot 1	1.0
Jesse Saroca	12/11/25	Update for snapshot 2	1.1
Jesse Saroca	12/11/25	. Update for snapshot 2	1.2

1 Introduction

1.1 Purpose

The purpose of this document is to provide a detailed description of the EagleNAV. This document will outline the system architecture, user interface, and intended audience for the application.

1.2 Intended Audience

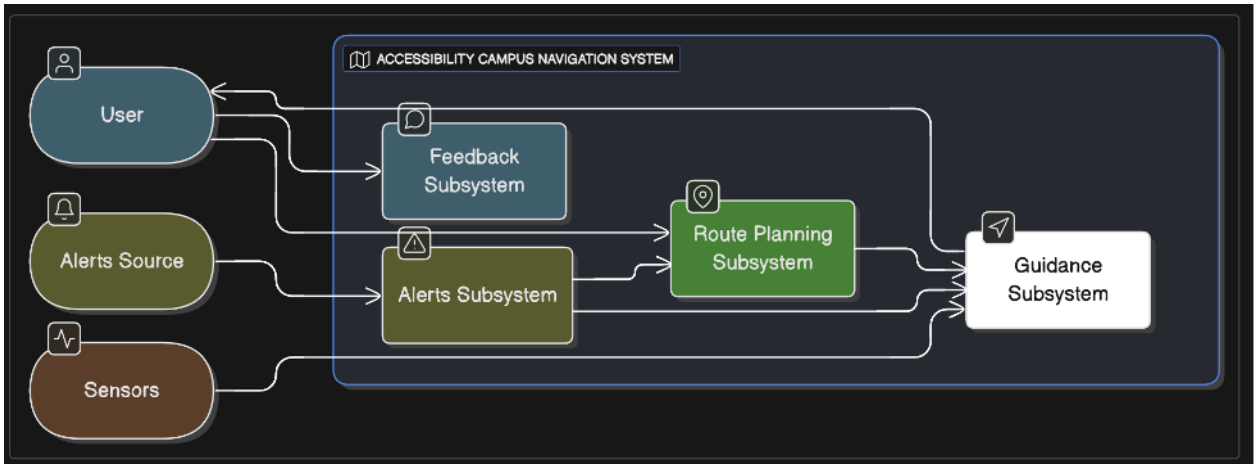
The intended audience for this document includes:

- Software Developers: This document will allow people to understand the system architecture and application UI of the software to understand and build on what was already created.
- Project Managers: This document will allow people to understand how the architecture's components interact with each other in order to better plan tasks and resources.
- Testers: This document will allow people to understand the architecture before making test cases that will search for all possible bugs and issues before being fully released.
- Stakeholders: This document will people to understand what is being built in the system architecture to have more faith in the project.

1.3 Overview

The EagleNAV will be a mobile application that allows users to use their phone camera to navigate through their college campuses. The application will provide a user-friendly interface and clear instructions that will guide the user.

2 System Architecture



2.1 Workflow

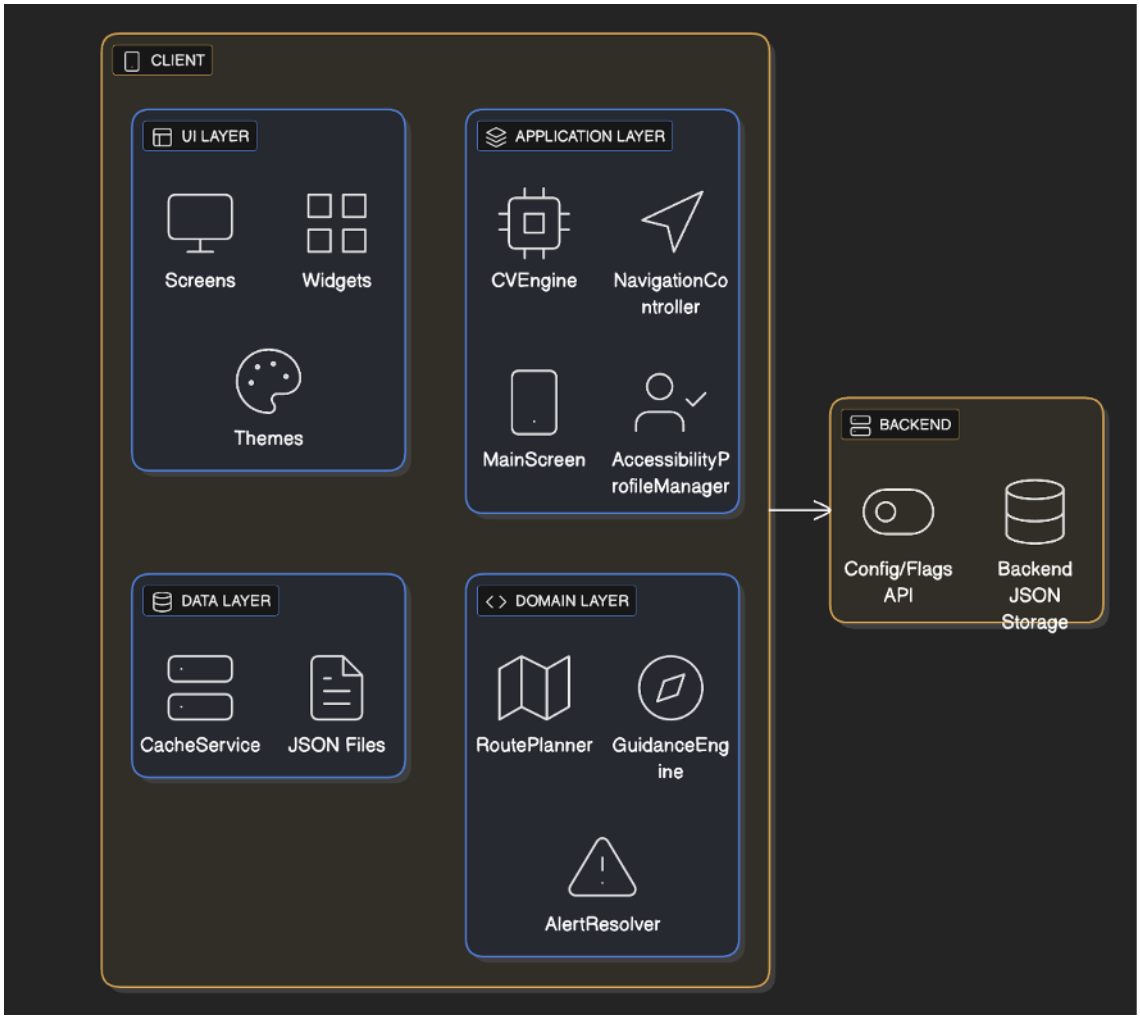
The user workflow of the EagleNAV will consist of:

- User authorization to use location and camera
- User submission of destination choice
- EagleNAV sends a routing request
- EagleNAV directs user towards their destination

2.2 App Breakdown

The Accessibility Campus Navigation System is divided into several key areas:

- Route Planning Subsystem: Uses the local routing server and Route Planner Engine provide the assembled route.
- Guidance Subsystem: Uses sensors to give a consistent direction to the inputted location.
- Alerts Subsystem: Uses campus records to indicate obstructions in routes to find a new faster route.
- Feedback Subsystem: User inputted feedback reports.



2.3 Data Flow - New Audit

3 User Interface

3.1 How to Use

- Map: Includes a search bar and current location.
- Camera: Find the navigation arrow in the augmented reality space.
- Favorites: Saved places.
- Alerts: List of active campus impacts in order to re-route user.
- Settings: Change text size, contrast, haptic intensity, or captions.

3.2 Database Explanation

The database for EagleNAV is stored in json files:

- bookmarks.json - stores saved routes
- points.jeojson - stores POI and custom landmarks
- depth_estimator.tflite - ML model that can guess distances from objects in frame
- object_detector.tflite - ML model that can detect objects in frame

Glossary

AR - Augmented Reality

NAV - Navigation

POI - Point of Interest

ML - Machine Learning

References

Ascent - Project. (2025-2026). Cysun.org. https://ascent.cysun.org/project/project/view/248