EzParking - Real Time Parking Lot Recommendation System

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Abstract

Driving is one of the preferred means of transportation for modern people, and vehicles have brought people a lot of conveniences.
Finding a parking space is also a problem that every driver must face.

A suitable parking space near the destination is very important for people, it can shorten the walking time for users to reach the destination.

Therefore, it is necessary to have software that can query the nearest suitable parking space for the user. It saves the user time to find a parking space and avoids unnecessary walking distance for the user.

EzParking software is dedicated to recommending the nearest parking space through pre-set data and real-time data. Calculates the results and sends them to the client application to recommend which parking lot the user goes to, resulting in the shortest walking distance.

Objective

Our parking lot recommendation app is designed to make parking simple, easy, and hassle-free.

With our app, users of all age group and backgrounds can quickly find the best available parking lot with shortest walking distance.

Our app is designed to be intuitive and user-friendly, with a clean and straightforward interface that allows anyone to use it with ease. Whether you're a tech-savvy young adult or a senior citizen unfamiliar with mobile apps, our product is accessible to everyone.

Our app is also highly efficient, using advanced algorithms and data analysis to recommend the most convenient parking options based on your destination. You'll never have to waste time circling the block or struggling to find a spot again.

And with its versatile design, our app is ideal for use in a wide range of settings, including universities, malls, hospitals, and more.

Whether you're a student trying to find a parking spot on campus, a shopper looking for a convenient place to park, or a patient visiting a hospital, our app has you covered.

Experience the convenience and efficiency of our parking recommendation app today and never struggle to find parking again!
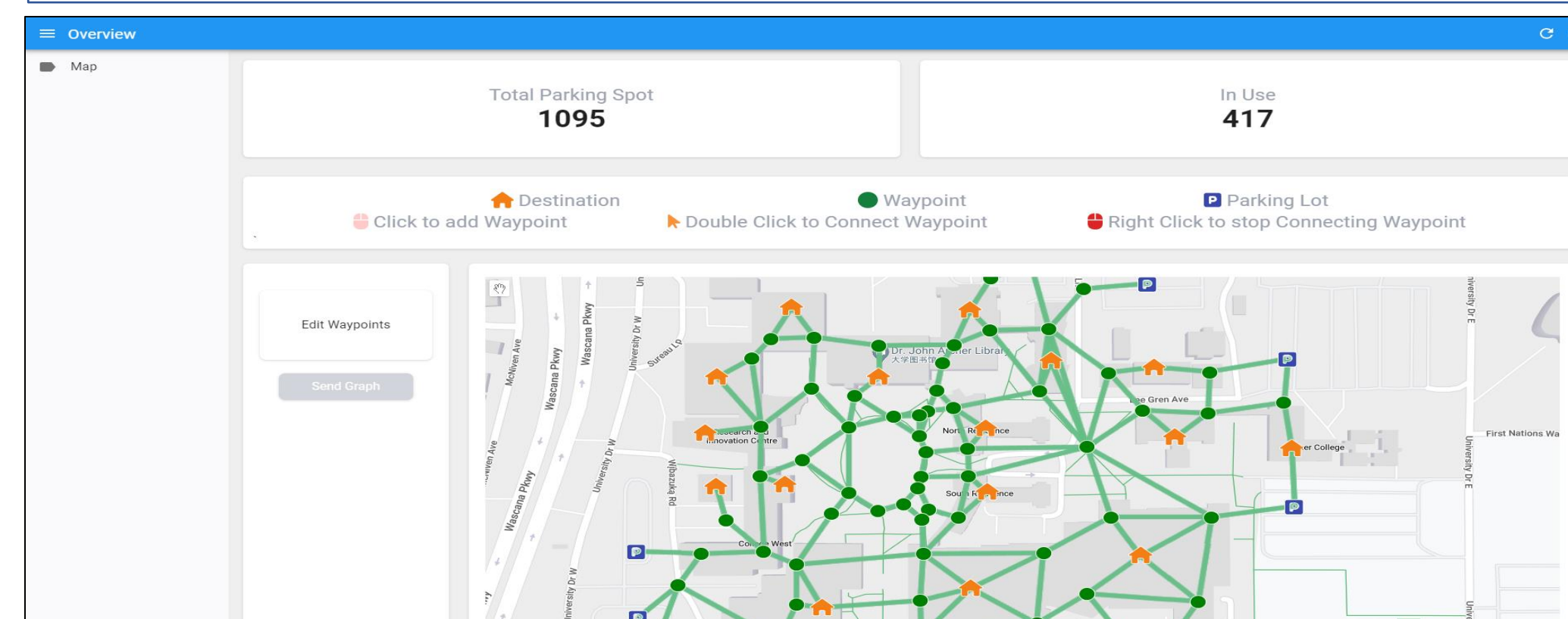
Workflow Diagram
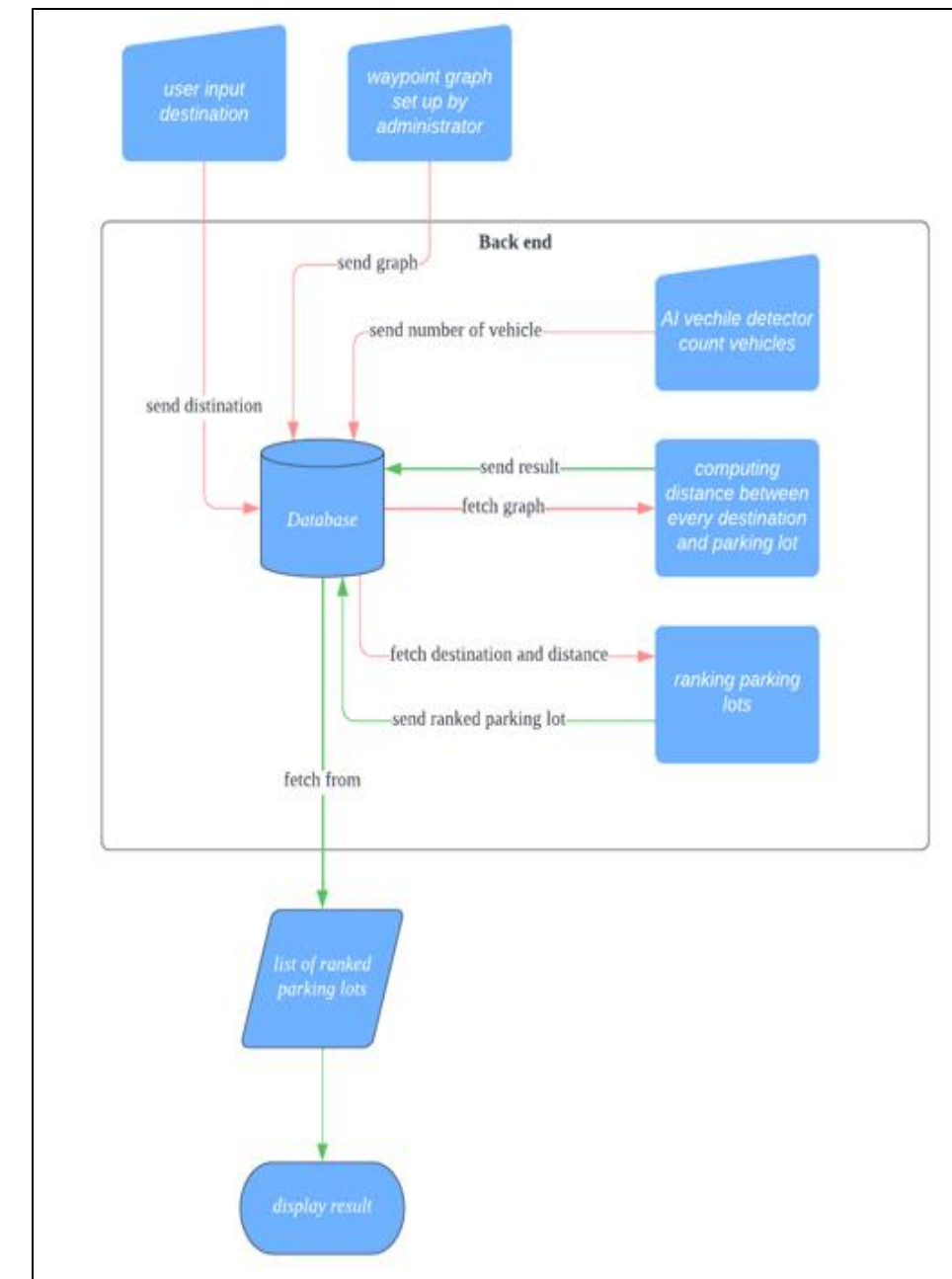
The main operation logic of our software is shown in the figure below. It is very easy to use, and users can get the results they want with just three simple clicks.
But behind the simple surface, our system is complex

Tech Stack

At the heart of the EzParking project is the backend, which offers a variety of services, including retaining data from the MyAdmin application and the AI detector, calculating the shortest paths from each parking lot to every destination, and responding to requests sent from the client application. With its functions of storage, response, and computation, the backend plays a crucial role in the overall functionality of the EzParking project.

The EzParking AI detector application is responsible for detecting vehicles as they enter and exit parking lots and updating the relevant numeric information in real-time to the project's database. By providing this important service, the AI detector ensures that the database remains up-to-date and accurate, which in turn helps to streamline the overall user experience.

Finally, the client application serves as the primary user interface for the EzParking project. It allows users to select their desired destination, and then provides a list of the five most optimal parking lots, ranked from the best on the top. Upon selecting their preferred parking lot, users can commence navigating toward the designated parking space. Thanks to its intuitive user interface and flawless integration with other project components, the EzParking application operates with utmost efficiency and is fully equipped to deliver its intended services.
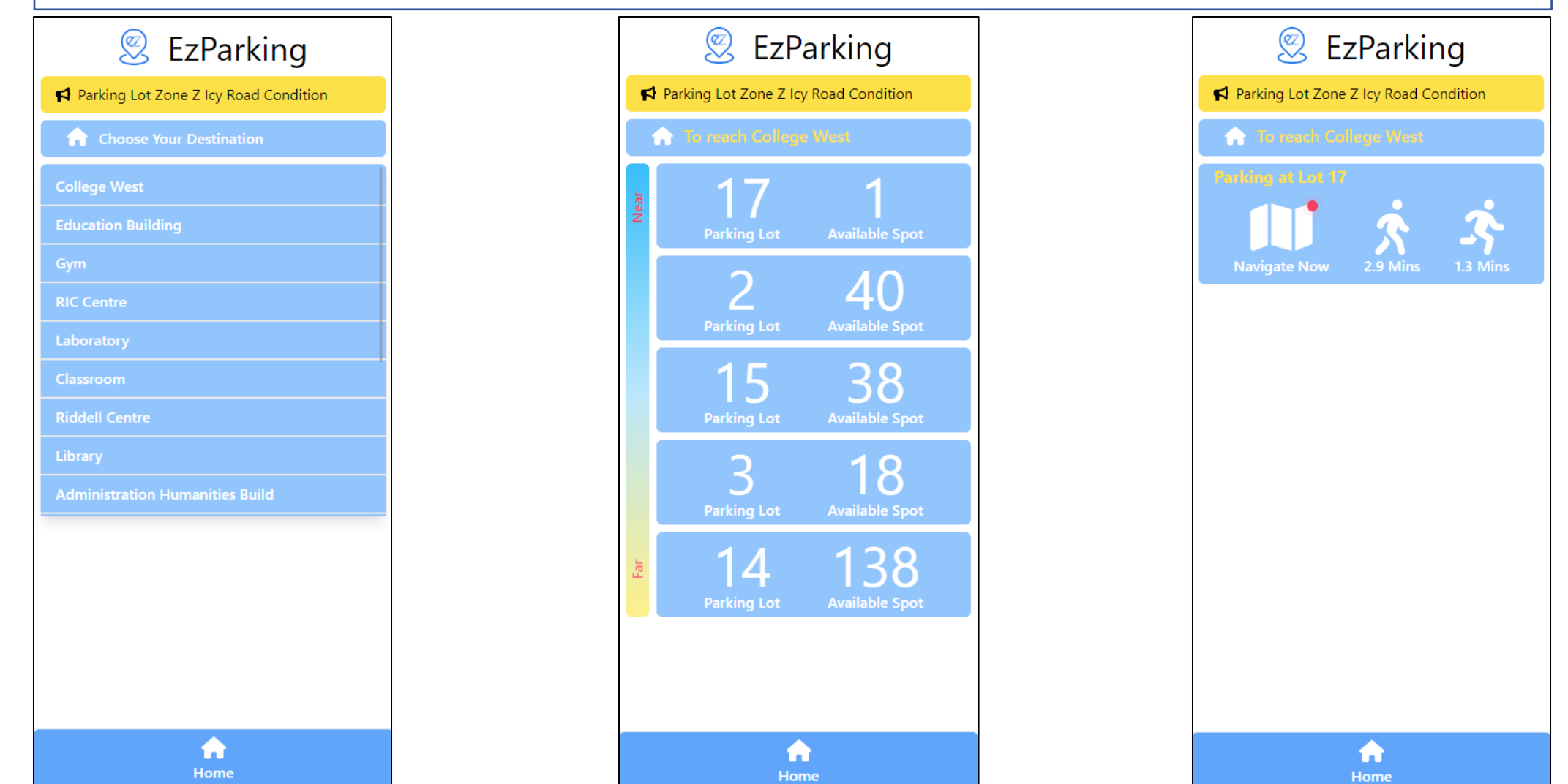

Results

The MyAdmin application was created to streamline the management of waypoints in the EzParking project. This includes the management of destinations, parking lots, and uploading maps. By providing users with the flexibility to add, delete, and name waypoints according to their specific needs, MyAdmin simplifies the process of managing these important elements.

Conclusions

EzParking is a system that recommends parking spaces in real-time. It consists of three parts, React, Java backend, and Python AI backend. The React front-end interface is responsible for user interaction functions. The Java backend is responsible for the background operation logic of the system, such as path calculation, parking lot recommendation, authorization authentication, etc. The AI backend is responsible for detecting vehicle entry and exit and sending it to the Java backend to change the real-time status of the parking lot in the database.

MyAdmin allows the administrator to easily draw the traffic map of a certain area on the map, connect each parking lot easily by adding waypoints, and finally generate the shortest path of each building road parking lot with one click.

The client page maintains a simple style and simple operation and is easy to use. It only takes three steps to find the parking lot with the best distance from the user's destination.

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