

Project Report

Title: Intelligent Ridesharing System

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Abstract

The Intelligent Ridesharing System project aims to develop an efficient and intelligent platform for managing ridesharing operations in a dynamic urban environment. This report provides a comprehensive overview of the project, its objectives, methodology, implementation, results, and conclusions.

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1. Introduction

The rapid growth of urban areas has led to increased demand for ridesharing services. This project addresses the need for an intelligent and dynamic system that optimizes the allocation of vehicles to passengers while considering real-world constraints and traffic conditions.

2. Project Overview

2.1 Objectives

The primary objectives of the project include:

- Designing a ridesharing platform.
- Developing scheduling algorithms.
- Implementing route optimization.
- Simulating ridesharing operations.

2.2 Scope

The project focuses on simulating ridesharing operations in a controlled environment. The system will optimize van allocations, routes, and schedules based on passenger requests and traffic conditions.

3. Methodology

3.1 Data Structures

The project employs a graph-based data structure to represent the road network and van locations. We use NetworkX to create the graph and implement routing algorithms.

3.2 Algorithm Design

The core algorithms include:

- Pickup and drop-off assignment.

- Route optimization using Dijkstra's algorithm.
- Van parking and scheduling.

4. Implementation

The system is implemented in Python. It comprises classes for vans, passengers, and the simulation environment. We simulate ridesharing requests, van movements, and scheduling.

5. Results

The project provides insights into the efficiency of ridesharing operations. Metrics include:

- Average distance traveled.
- Number of trips per day.
- Impact of changing the fleet size and graph connectivity.

6. Discussion

We discuss the challenges faced during implementation, such as handling dynamic traffic conditions and managing customer waiting times. Potential improvements are explored.

7. Conclusion

The Intelligent Ridesharing System project successfully demonstrates the feasibility of an intelligent ridesharing platform. It offers valuable insights into optimizing van allocations and routes in dynamic urban environments.

8. Future Work

Future enhancements may include:

- Real-time traffic data integration.

- Advanced route optimization algorithms.
- Mobile application development.

9. References

- [Author, A. (Year). Title of the publication. Publisher.]