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Car Pooling

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Abstract

Car pooling has emerged as a sustainable solution to reduce traffic congestion, lower carbon emissions, and save on transportation costs. This paper explores various existing methods and introduces a new approach to improve the efficiency and user experience of car pooling systems. With advancements in machine learning and mobile technology, car pooling can be optimized to provide a convenient, cost-effective, and environmentally friendly alternative to single-passenger driving. By integrating real-time data, user preferences, and dynamic routing algorithms, our proposed method aims to enhance the matching process and optimize travel routes.

Introduction

Car pooling, the practice of sharing a ride with others traveling in the same direction, has gained significant attention in urban mobility solutions. It offers a potential answer to the growing challenges of urban congestion, air pollution, and the ever-increasing number of vehicles on the road. With cities facing overcrowded streets and limited parking spaces, car pooling serves as a practical and efficient method for individuals to reduce travel costs and environmental impact. This paper delves into the concept of car pooling, its significance, and the factors influencing its adoption, aiming to highlight its potential as a smart transportation alternative.

Literature Survey

In the field of car pooling, various studies have been conducted to improve matching algorithms, optimize routes, and analyze user behavior. Research on car pooling platforms has primarily focused on leveraging data-driven techniques to predict the best pooling opportunities based on factors like location, time, and route preferences. Some existing systems use algorithms such as the k-means clustering method or genetic algorithms to match users efficiently. However, despite the promising results, challenges such as real-time traffic adaptation, driver incentives, and rider preferences remain largely unaddressed. This literature review highlights these challenges and the contributions of past research to car pooling solutions.

Existing Method

Current car pooling systems rely on either centralized or decentralized approaches to match drivers and passengers. Centralized systems, often based on mobile apps, collect data from users and make match suggestions through pre-programmed algorithms. These systems consider factors such as geographic proximity, preferred times, and travel routes. However, existing methods often fall short in adapting to real-time traffic changes, dynamic user preferences, and fluctuating demand patterns. Additionally, the incentive structure for drivers and passengers in current systems is often weak, leading to less participation and suboptimal results in terms of cost savings and environmental benefits.

Proposed Method

The proposed method improves upon existing car pooling systems by incorporating machine learning algorithms that learn from user behavior and dynamically adjust to real-time conditions. The system would use GPS data, traffic patterns, and rider preferences to propose optimal routes and match users with greater accuracy. A personalized incentive system would also be introduced, where users can earn points based on the environmental impact of their ride-sharing behavior. These points could be redeemed for discounts or other benefits, thereby encouraging participation and improving system efficiency. The dynamic nature of the system would provide more flexibility, ensuring better service and higher satisfaction levels for both drivers and passengers.

RESULT

In this project we are developing carpooling application which can be managed by two users

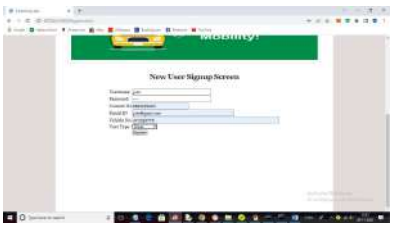
1) Driver: driver can signup and login to application and then enter his location name, latitude and longitude (here note that mobiles will have GPS we can get location from GPS but computer or laptop don't have GPS and we can track from IP but that IP must be registered with DN server and this will not be available so we need to enter location manually) and wait for passenger request. If any passenger in 3 miles distance send request then driver can accept request from multiple users and then click on 'Start Ride' link to start ride and then once ride completed then entered miles travelled to collect fare.
2) Passengers: passenger can signup and login to application and then manual enter their location and share with Drivers and drivers can accept request to start ride. Passenger can give ratings also on the scale of 1 to 5

To run project install Python 3.7.0 and then install MYSQL and give MYSQL password while installation as 'root. After installation open MYSQL console and copy content from 'DB.txt' file and then paste in MYSQL to create database.

Note: run both driver and passenger module in different browsers or different tab means driver in one browser and passenger in other browser or other tab

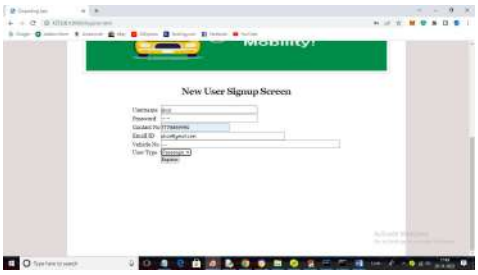
Now double click on 'runServer.bat' file to start python WEB SERVER and then open browser and enter URL as 'http://127.0.0.1:8000/index.html and press enter key to get below page

In above home page click on 'New User Signup Here' link to add new users like driver and passenger

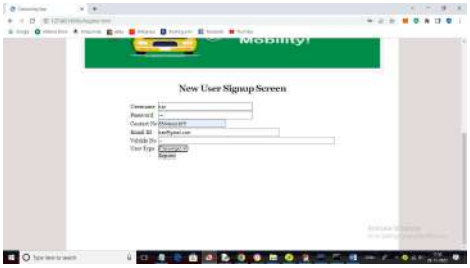


In above screen I am adding one user 'John' as driver by selecting user type as Driver and then press button to complete signup process and get below output

In above screen in blue colour text we can see signup completed and similarly you can add other drivers and passenger



In above screen I am adding 'alice' as the passenger



In above screen I am adding 'ben' as the passenger so total 3 user added where one is driver and other 2 are the passenger and now click on 'Driver/Passenger Login' link to login as Driver

In above screen driver is login and after login will get below page

In above driver home page click on 'Enter Your Location' link to allow driver to publish his locations so passenger can book ride

In above screen driver entering his location with latitude and longitude and then press button to get below page

In above screen we can see driver ride details added with ID 1 and all passenger request will arrived here so let this screen running and no open other browser or tab and login as user

In above screen passenger is login and after login will get below page

In above passenger home page click on 'Share Location' link share location with diver and get below page

In above screen user is entering his location and press button to get list of drivers in 3 miles distance and get below page

In above screen user got one drive as 'John' in 3 miles distance and user can click on 'Click Here to Share Location' then driver will get this chat notification

In above screen user ride request is booked with ID 1 and this request will sent to driver at below driver page

In above screen driver can see 'Alice' is requesting for ride and now driver can click on 'Click Here to Accept' link to accept request and get below page

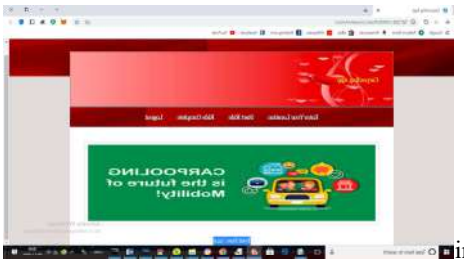
In above screen alice request accepted and driver will wait for other users and now will send request from Ben

In above screen driver got request from Ben also and he will accept request and then click on 'Start Ride' link to start ride and get below page

In above screen in blue colour text we can see 'Ride Started' and now driver can click on 'Ride Completed' link to get below page to collect fare

In above screen driver will select Ride Id and Passenger Id and then enter miles travelled and press button to get fare amount

In above screen I selected Ride ID as 1 and passenger ID as 2 and then miles travelled as 12 and then press button to get below Fare amount



in above screen in blue colour text we can see fare amount is 12 and now in user page click on 'Giving Rating' link to get below page

In above screen passenger will select Driver name and then select rating and then press button to get below output

In above screen we can see 'Rating Accepted'. Similarly by following above screens you can add multiple users and test the application

Conclusion:

Car pooling has the potential to revolutionize urban mobility by offering an effective, sustainable, and efficient transportation alternative. The proposed method seeks to enhance existing car pooling systems by integrating machine learning and real-time data analysis to improve user experience and optimize routing. By addressing the limitations of current methods, such as static matching and weak incentives, this approach provides a more dynamic and personalized solution to the car pooling challenge. As cities continue to grow and face mounting traffic issues, innovative solutions like the one proposed in this paper will be key to creating smarter, greener, and more efficient transportation systems

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