

AI-Powered Decentralized Ride Hailing Platform

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1 Domain

The project domain primarily focuses on transportation and logistics. Logistics involves the process of planning and executing efficient transportation from a source to a destination. Efficient transportation and logistics carry huge potential to be used in ride hailing, where the clients are drivers and common folks. Here, anyone can book a ride to his/her preferred location and pay a fixed fare rather than bargaining fares in a traditional system.

2 Problem Statement

The currently operating ride-hailing platforms have remained the same from a long period of time, and they have full-control over their drivers and their customer data. They have the ability to know about every user in their platform, and the trips that happen in real-time. This is a major problem in terms of privacy and trust that is required for an end-customer to use such a platform.

Further, these platforms have their primary focus on making profits and generating revenue, and look for ways to optimize in doing just that, which often involves misuse of the passenger data. Thus, these platforms often have long waiting times for customers, unhappy drivers, and unfair prices for trips.

Our platform aims to solve these problems by providing the customers with a decentralized ride-hailing platform, where they have complete control over their data, and will ensure that they have a seamless and friction-less experience when choosing to use our platform.

Our platform will carry out payments through cryptocurrency and ride-booking powered entirely by smart contracts thus ensuring decentralized ride-booking and peer-to-peer payments, and will also focus on ensuring reduced waiting time at various locations by making use of AI algorithms that ensure that there are always sufficient vehicles present across various locations that guarantee minimum waiting time for the end-customers. Further, our platform will also involve an AI based dynamic pricing model that is used for calculating the fares of these trips.

3 Objectives

Overall, our platform aims to achieve the following objectives:

- Building a decentralized system that enables people to book rides and make payments through cryptocurrency.
- Building an AI model to reduce the waiting time of customers by making use of clustering to find the high-demand regions and allocating certain number of vehicles to it.
- Building an AI model capable of estimating the price of the trips also taking into account of supply, demand to ensure fair compensation.
- Building an overall web application that enables users to book rides in a decentralized manner and handle all the operations involved in ride booking.

4 Expected Outcome

A web application that is built on top of the Polygon blockchain that aims to perform decentralized ride booking along with friction-less cryptocurrency payments, complete with all the necessary features and operations required to carry out ride-booking.

An AI model which clusters users based on their ride bookings and allocates drivers to each cluster accordingly.

An AI model that performs dynamic pricing based on demand and availability of drivers to ensure fair compensation.

References

- [1] Kudva, Sowmya, et al. "Pebers: Practical ethereum blockchain based efficient ride hailing service." 2020 IEEE international conference on informatics, iot, and enabling technologies (iciot). IEEE, 2020. pp: 3100-3112
- [2] Xiang, Ding et al. "Dynamic Price Discrimination In Demand Response Market: A Bilevel Game Theoretical Model." 2018 IEEE Global Conference on Signal and Information Processing (GlobalSIP). 2018.
- [3] Jani, Kruti, Om Prakash, and C. Bala Subramanian. "Developing Secured Peer to Peer Ride Sharing Services based on Blockchain Technology." Design Engineering (2021): pp: 3924-3930.
- [4] Srinivas, Rishi, B. Ankayarkanni, and R. Sathya Bama Krishna. "Uber Related Data Analysis using Machine Learning." 2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS). IEEE, 2021.
- [5] Battifarano, Matthew, and Zhen Sean Qian. "Predicting real-time surge pricing of ride-sourcing companies." Transportation Research Part C: Emerging Technologies 107 (2019): pp: 444-462.
- [6] Gupta, Rajan, and Chaitanya Pathak. "A machine learning framework for predicting purchase by online customers based on dynamic pricing." Procedia Computer Science 36 (2014): pp: 599-605.
- [7] Gaži, Peter, Aggelos Kiayias, and Dionysis Zindros. "Proof-of-stake sidechains." 2019 IEEE Symposium on Security and Privacy (SP). IEEE, 2019.
- [8] <https://polygon.technology/lightpaper-polygon.pdf>