



COS60011 TECHNOLOGY DESIGN PROJECT PROJECT DEMONSTRATION

BAO MINH TRAN 104763815

PORNTEERA CHOMTONG 104186894

SYED UMER HASNAN ZAIDI 104776376

WILASINEE MONGKOLSRI 104332341

ZHAO JUN CHIN 105210037

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PRESENTING:
SYED UMER HASNAN ZAIDI

ACKNOWLEDGMENT OF COUNTRY

We Bao Minh Tran, Pornteera Chomtong, Syed Umer Hasnain Zaidi, Wilasinee Mongkolsri and Zhao Jun Chin respectfully acknowledge the Wurundjeri People of the Kulin Nation as the Traditional Owners of the land on which Swinburne's Australian campuses are situated in Melbourne's east and outer east. Our sincere respect goes to their Elders, past, present, and emerging. We are committed to use in a manner that respects and honours the Elders and Ancestors of these lands.

INTRODUCTION

**SYED UMER HASNAN ZAIDI
104776376**

PRESENTING:
SYED UMER HASNAN ZAIDI



PROBLEM DESCRIPTION

Our transportation system currently faces many problems, such as traffic congestion, air pollution, and the lack of governmental intervention to solve such issues.

Traffic congestion is a major problem, clogging up the roads and frustrating drivers from all walks of life.

Air pollution also leaves a devastating effect on our planet and will be very bad for the environment in the long term.

The apathy of local governmental agencies in trying to solve this issue is an issue too as with their help these issues could start being solved.

PRESENTING:
SYED UMER HASNAN ZAIDI



PROJECT INTRODUCTION

Our Project mainly focuses on fixing these problems by introducing a platform for carpooling.

This will reduce the number of people on the roads by ensuring that people will travel in groups instead of going alone and bringing more cars out on the road.

This will also lessen the impact the amount of air pollution generated and also will not require extensive governmental supervision.

Carpooling will also ensure a great environment where our users will form new relationships and connections previously unseen.

PRESENTING:
SYED UMER HASNAN ZAIDI

OUR APPLICATION

DOES



- Matches two suitable people
- It uses an algorithm to find the clusters
- Offers a platform for communication
- Gives the user freedom in their choices
- Shows the benefits

DOES NOT



- It does not store real-time information
- It does not store insurance information
- It does not track the route
- No mobile app
- No price setting or cost splitting

OUR SOLUTION

**BAO MINH TRAN
104763815**

DRIVE2 WEBSITE OVERVIEW

COLLECT USER INFORMATION



- Demographics
- Vehicle Details
- Route Schedule
- Fuel Usage
- Preferences



DISPLAY MATCHES TO USERS

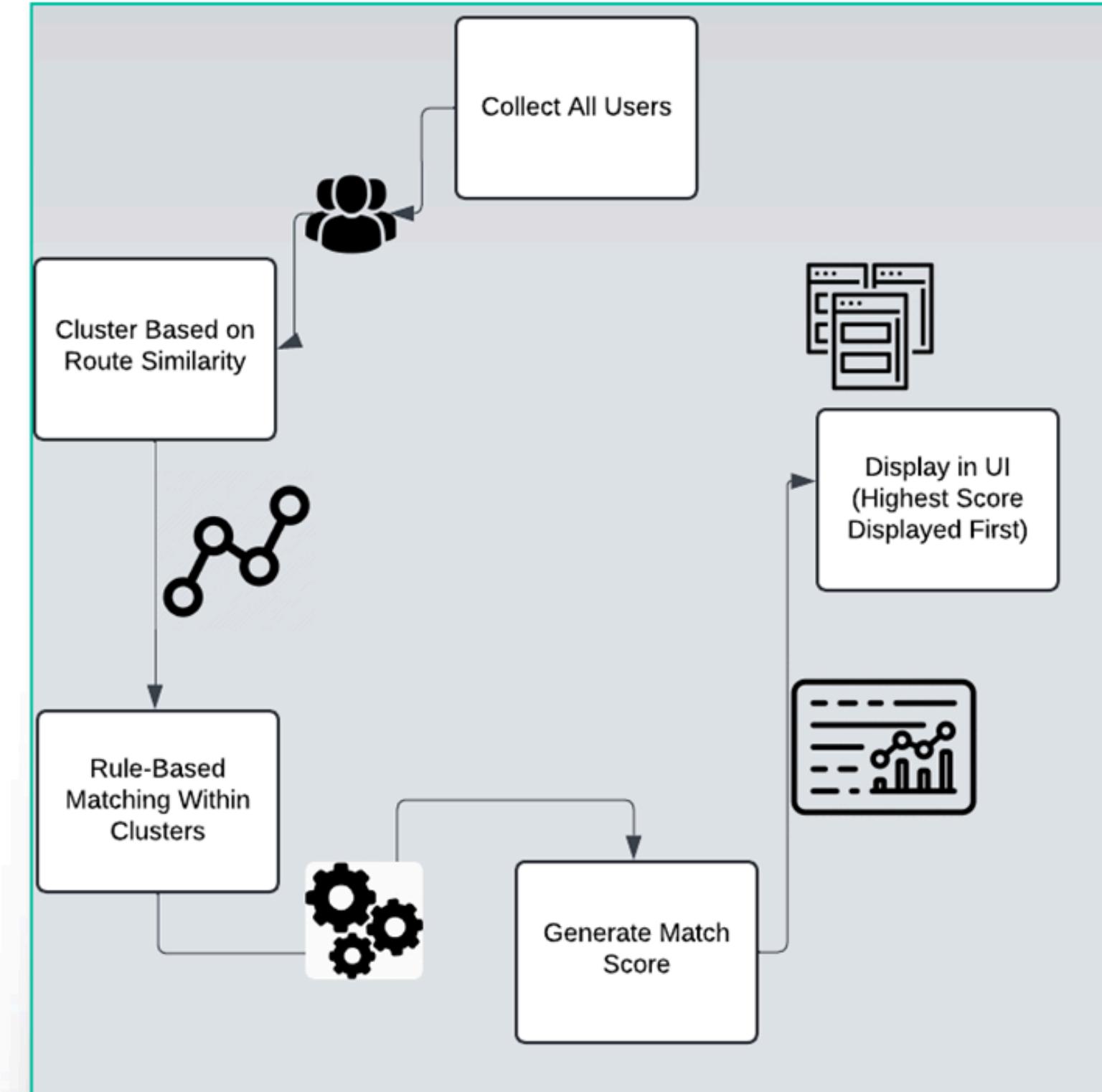


- Chat Feature
- Block Feature

concept clustering

PRESENTING:
BAO MINH TRAN

HOW MATCHING WORKS

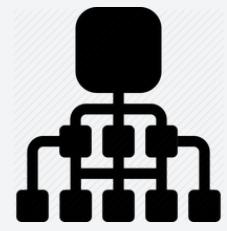


ROUTE SIMILARITY METHODS

DESCRIPTIONS AND KEY POINTS



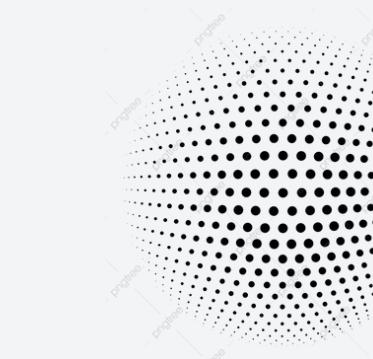
- Use of Polyline Package
- KMeans Clustering



VISUAL REPRESENTATION



- Polyline Visualization
- Clustering Visualization



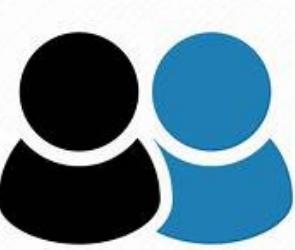
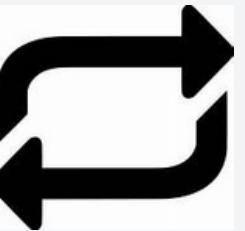
PRESENTING:

BAO MINH TRAN

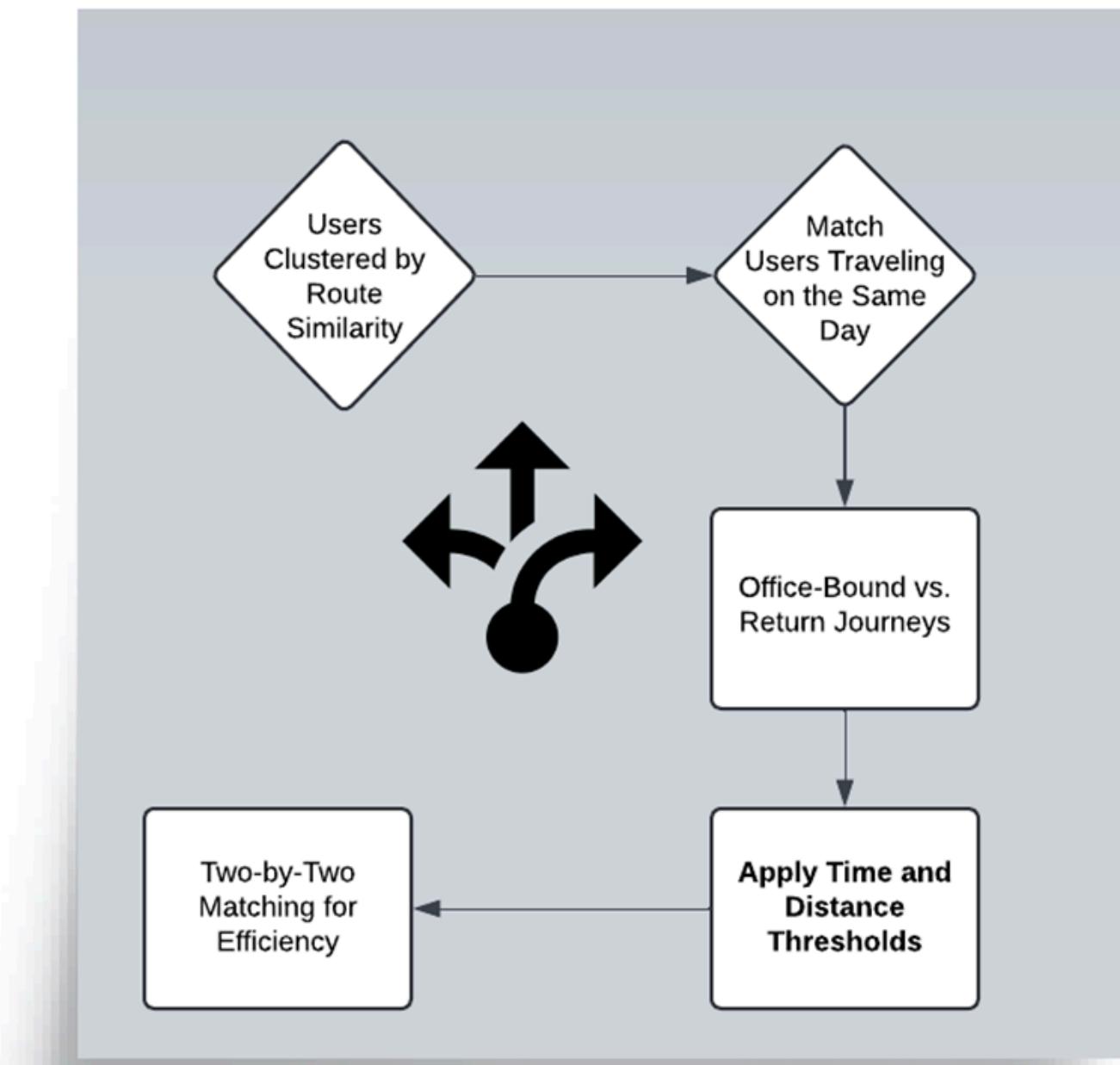
RULE-BASED ALGORITHM WITHIN CLUSTERING

RULE EXPLANATIONS

- Match Users Traveling on the Same Day
- Separate Matching for Office-Bound and Return Journeys
- Apply Time and Distance Thresholds
- Two-by-Two Matching for Efficiency



DECISION TREE DIAGRAM



MATCHING SCORE

MATCHING SCORE EXPLANATION



- Define Matching Score
- Formula:

$$\left(1 - \frac{\text{match-time-difference}}{\text{time-threshold}}\right) * \left(1 - \frac{\text{match-distance-difference}}{\text{distance-threshold}}\right)$$

USER INTERFACE DISPLAY EXAMPLE

- User Profile Picture
- User Name
- Matching Score

FUEL AND ECONOMIC SAVING

EXPLANATION OF SAVINGS CALCULATION

- Define Fuel and Economic Savings
- Formula for Savings



Reduction in CO₂ Consumption = Fuel_{saved} · Carbon saving factor

Economic Saving = Fuel_{saved} · Fuel price per litre

Fuel_{saved} = Fuel_(Person1, No carpool) + Fuel_(Person2, No carpool) - Fuel_{Carpool}

$$\text{Fuel}_{\text{Person 1 saved}} = \text{Fuel}_{\text{saved}} \cdot \frac{\text{Distance by Person 1}}{\text{Distance by Person 1} + \text{Distance by Person 2}}$$

$$\text{Fuel}_{\text{Person 2 saved}} = \text{Fuel}_{\text{saved}} \cdot \frac{\text{Distance by Person 2}}{\text{Distance by Person 1} + \text{Distance by Person 2}}$$

CARPOOLING NOT ONLY SAVES MONEY BUT ALSO BENEFITS THE ENVIRONMENT, MAKING IT A WIN-WIN SOLUTION!

EXAMPLE CALCULATION OF SAVINGS

BASED ON MATCHING ID

Fuel Consumption Results

Driver ID: 2

Passenger ID: 32

Fuel Calculations

Total Fuel without Carpool (liters): 0.5

Total Fuel with Carpool (liters): 0.29

Fuel Savings (liters): 0.21

Carbon Emission Savings

Total Carbon Savings (kg): 0.48

Carbon Savings for Driver (kg): 0.26

Carbon Savings for Passenger (kg): 0.22

Cost Savings

Total Cost Saving (\$): 0.39

Cost Saving for Driver (\$): 0.21

Cost Saving for Passenger (\$): 0.18

PRODUCT DEMO

ZHAO JUN CHIN
105210037

REGISTRATION PROCESS

The screenshot shows a web browser window titled "Consent Form - DRIVE2" with the URL "127.0.0.1:5000/consent". The page features the Drive2 logo at the top left and a "Back" button at the top right. The main content is titled "Consent Form" and includes a sub-section titled "Consent Article". The article text welcomes users to DRIVE2 and outlines the terms and conditions of using their carpooling service. It includes three numbered sections: 1. Introduction, 2. User Responsibilities, and 3. Privacy and Data Protection. At the bottom of the article, there is a statement: "I agree to the terms and conditions: ". Below this is a red "Continue to Registration" button. The bottom of the screen shows a taskbar with various icons and system status information.

Consent Form

By registering, you agree to our terms and conditions. Please read and accept the consent form below.

Consent Article

Welcome to DRIVE2. This consent form outlines the terms and conditions of using our carpooling service. Please read the following information carefully.

1. Introduction
DRIVE2 is a platform that provides an innovative solution for carpooling. By registering with DRIVE2, you agree to comply with the following terms and conditions. These terms apply to all users of the platform, including drivers and passengers.

2. User Responsibilities
As a user of DRIVE2, you are responsible for ensuring that the information you provide is accurate and up-to-date. You must use the platform in accordance with all applicable laws and regulations. DRIVE2 reserves the right to suspend or terminate accounts that violate these terms.

3. Privacy and Data Protection
Your privacy is important to us. We collect and process personal data as described in our Privacy Policy. By using our platform, you consent to the collection, use, and sharing of your personal information as outlined in the Privacy Policy.

I agree to the terms and conditions:

Continue to Registration

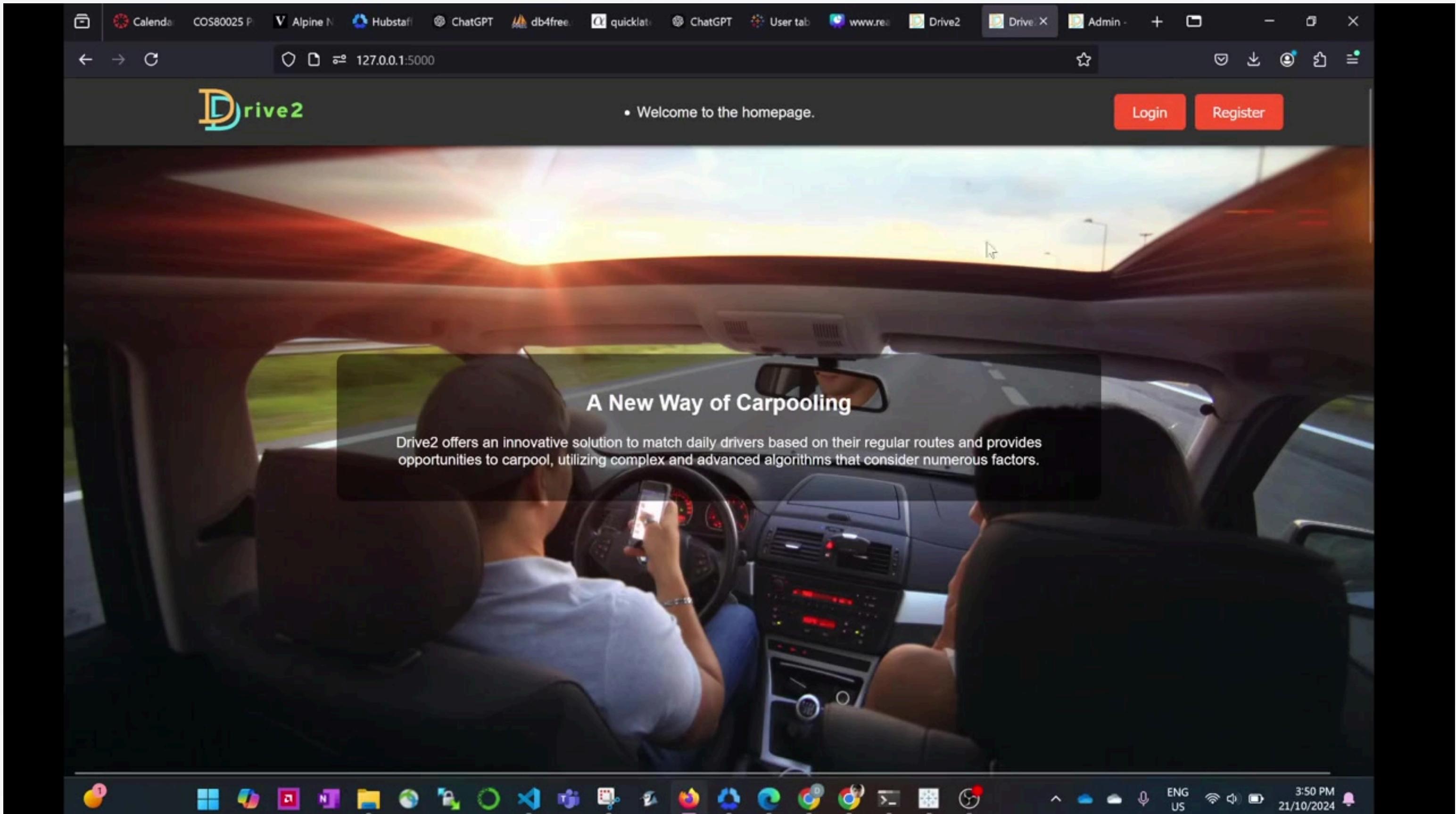
© 2024 DRIVE2. All rights reserved.

13°C Partly cloudy

11:52 PM
ENG US
20/10/2024

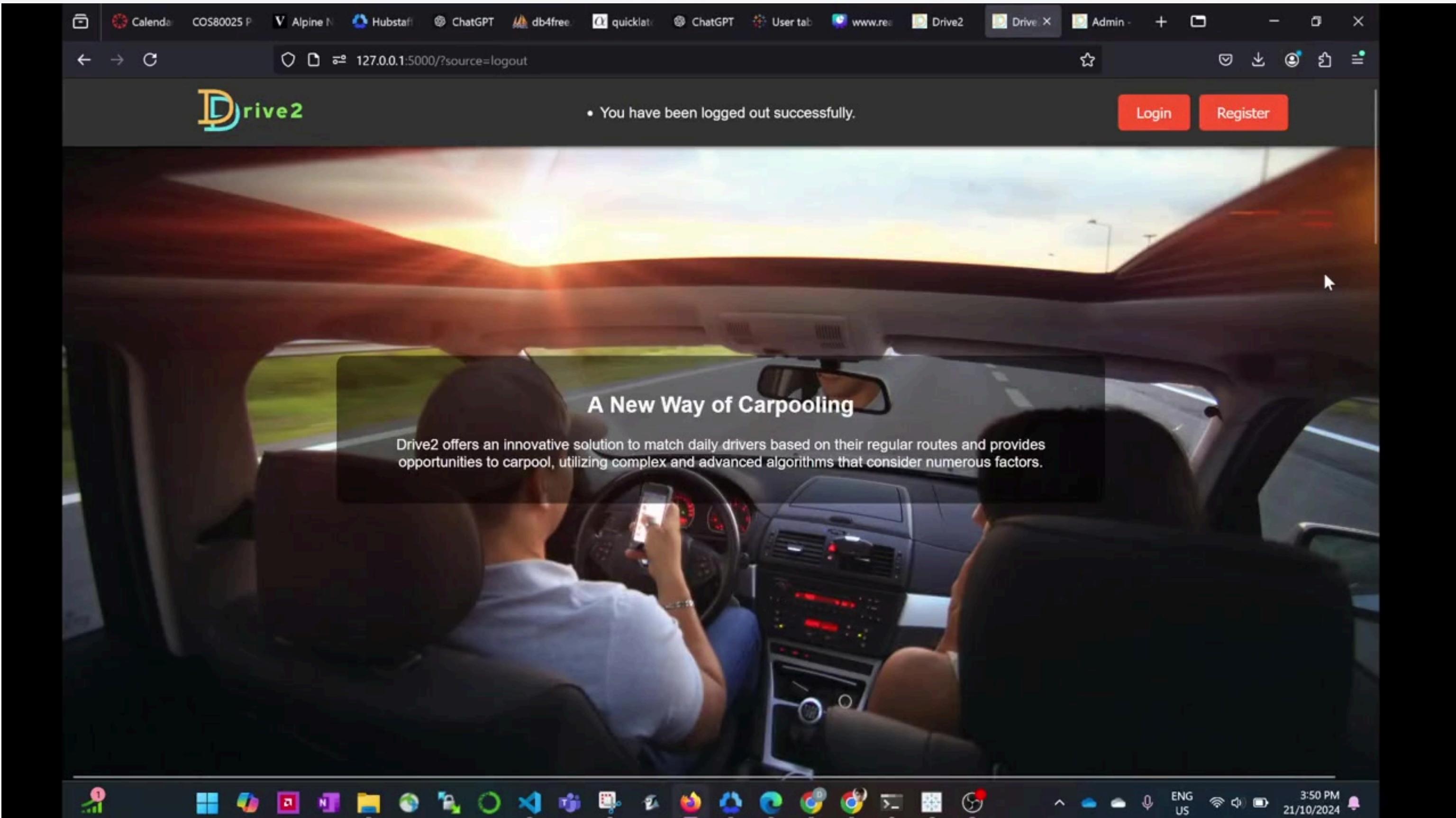
PRESENTING:
ZHAO JUN CHIN

USER INTERFACE



PRESENTING:
ZHAO JUN CHIN

ADMIN MONITORING



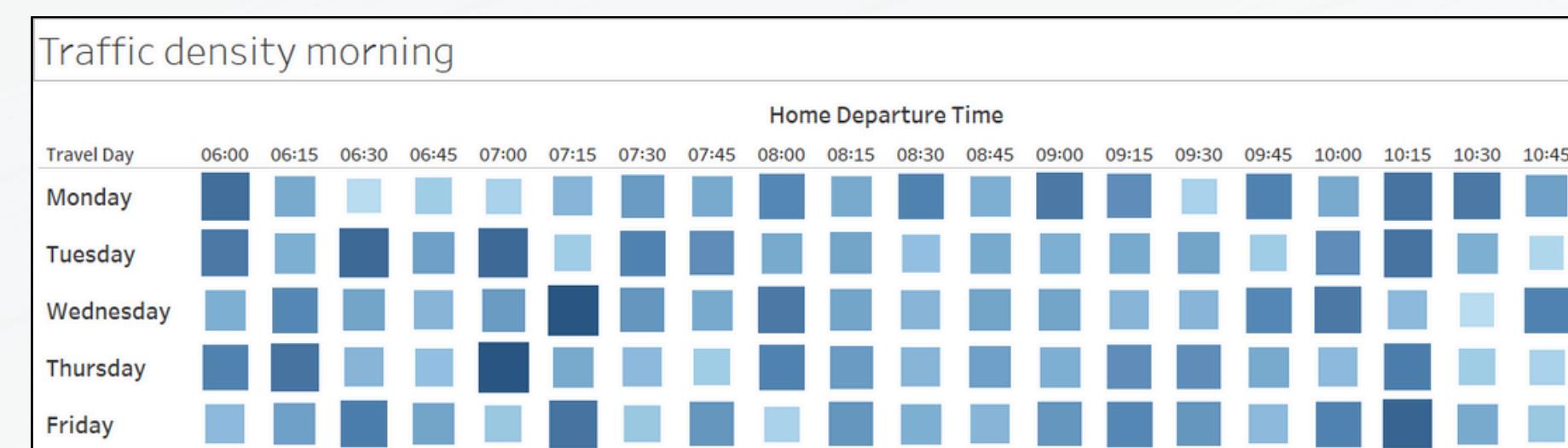
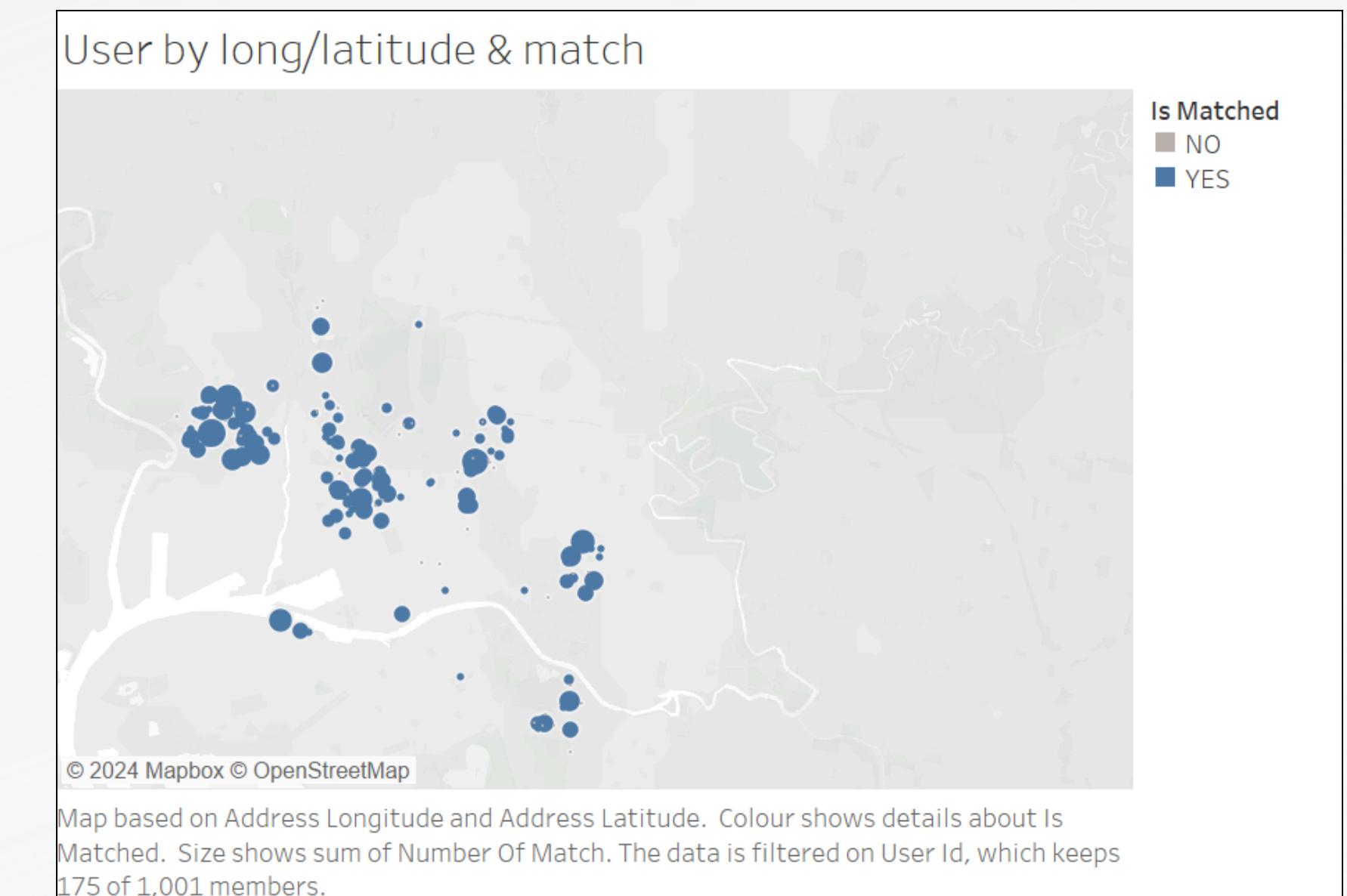
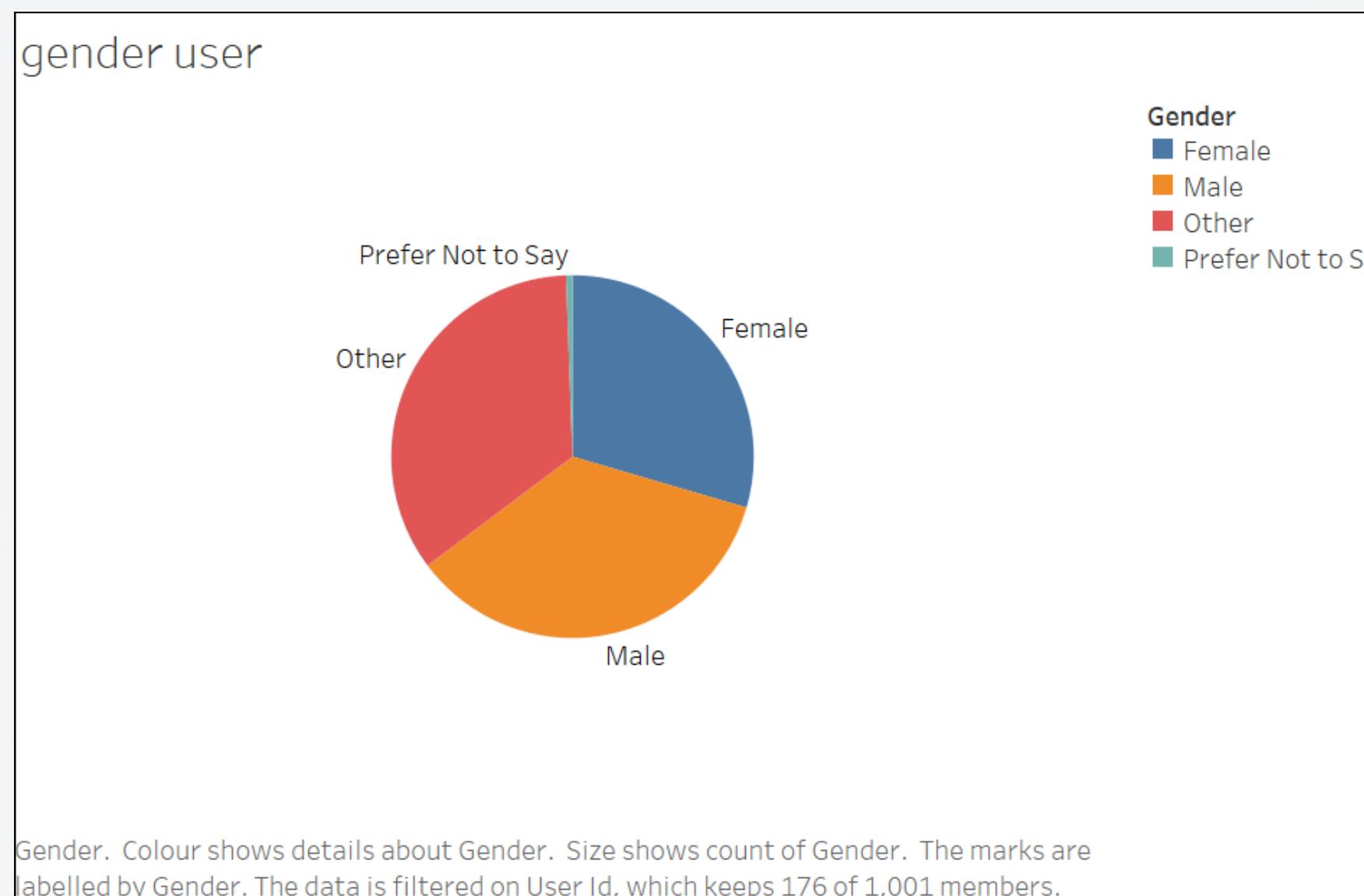


STATS AND VISUALS

**PORNTEERA CHOMTONG
104186894**

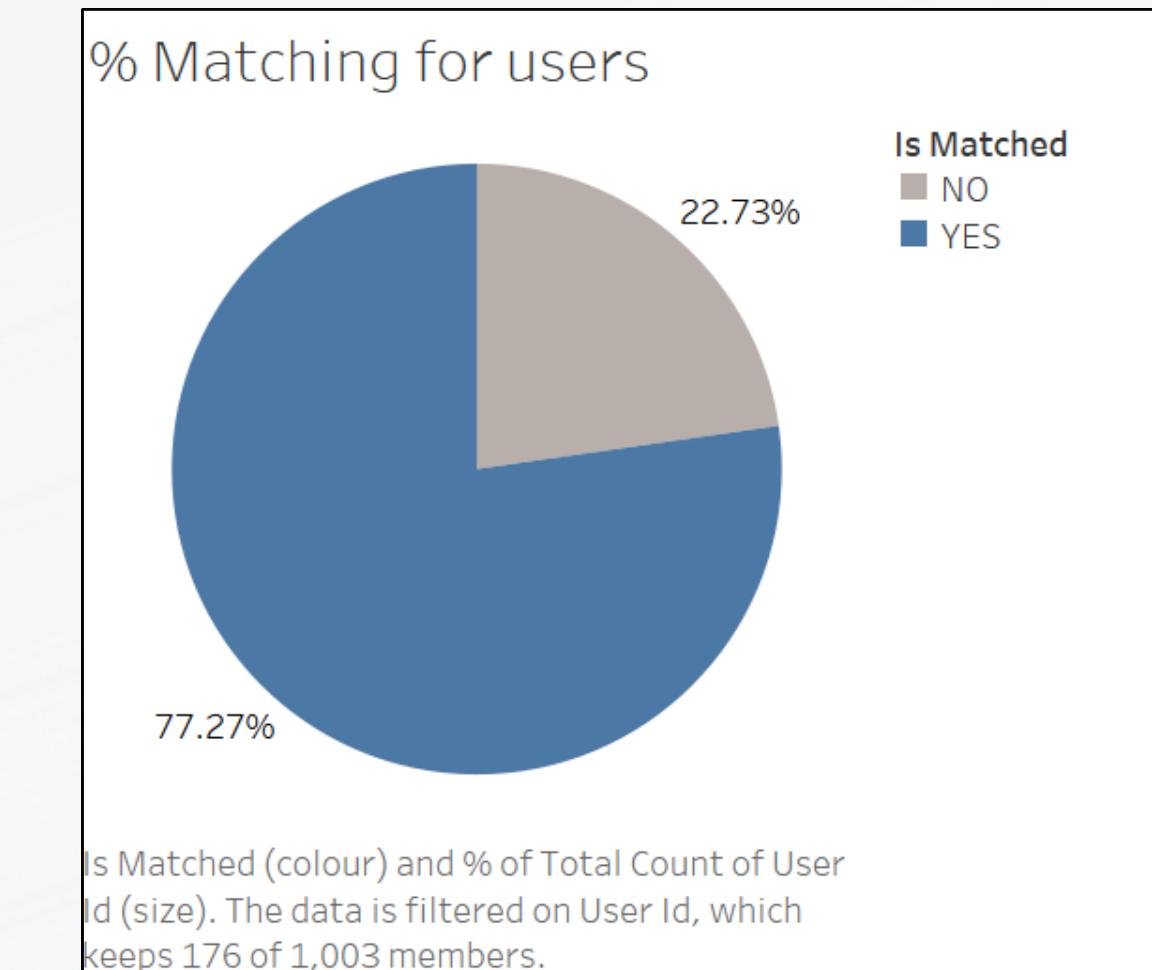
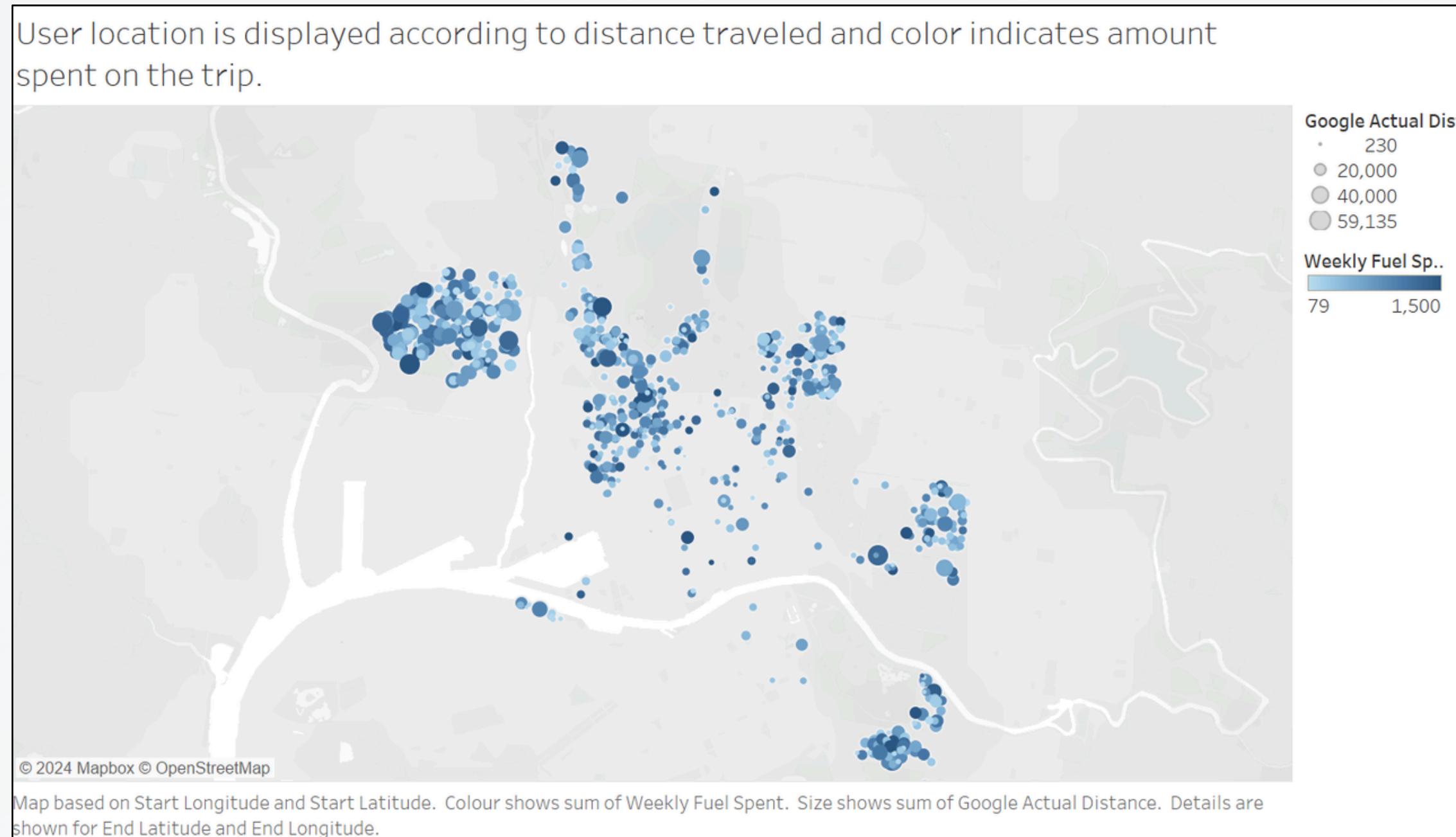
PRESENTING: PORNTEERA CHOMTONG

USER DEMOGRAPHY



**PRESENTING:
PORNTEERA CHOMTONG**

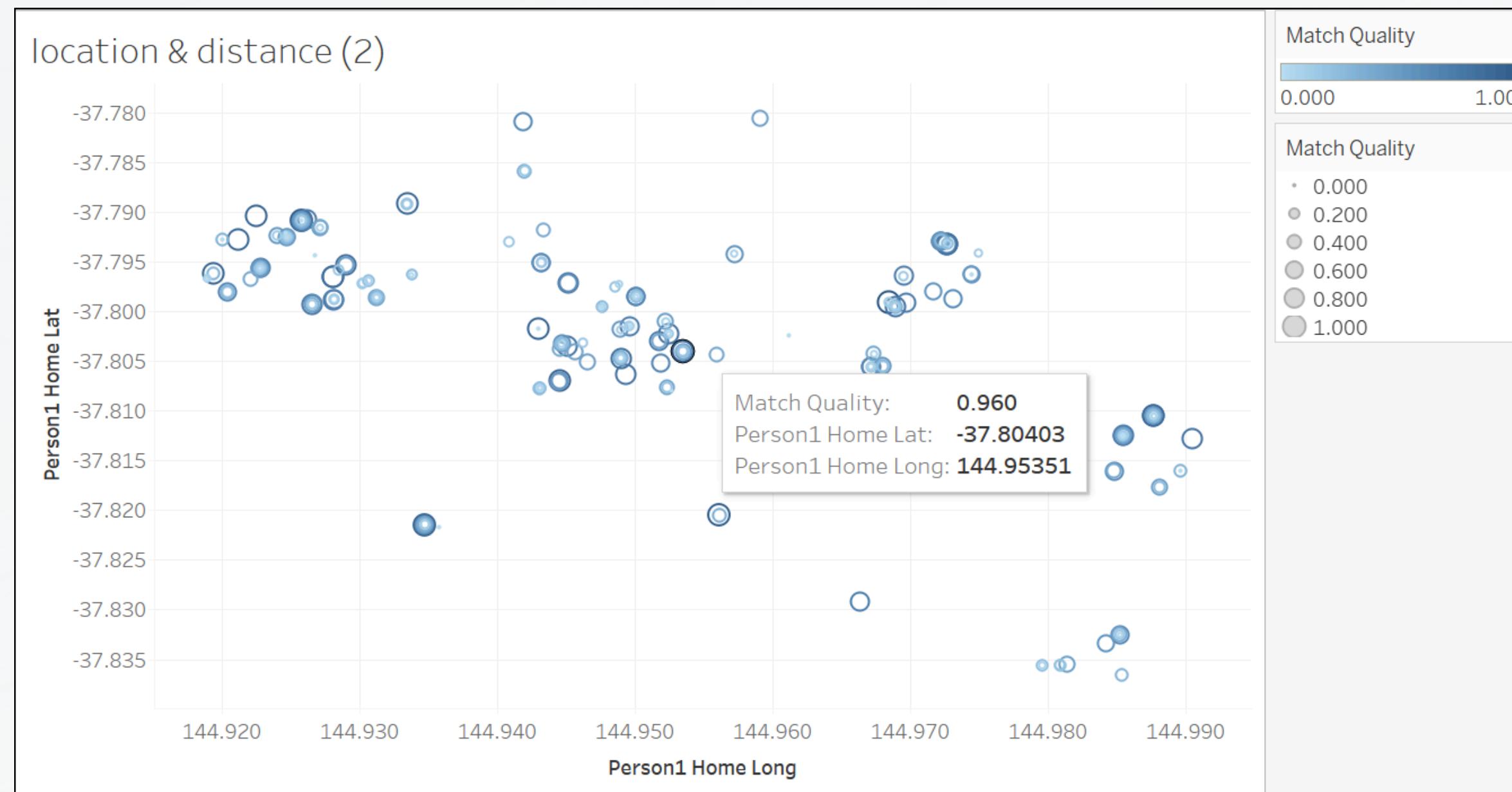
STATISTICS FOR CLIENT



PRESENTING:
PORNTEERA CHOMTONG

MATCHING EFFECTIVENESS

		Matched Day					
Match ..	Status	Match Direction	Monday	Tuesday	Wedne..	Thursd..	Friday
type_1	active	go	0.1930	0.1775	0.2150	0.3029	0.1900
		return	0.3736	0.4346	0.4259	0.3794	0.4539





LIMITATIONS AND FUTURE WORK

WILASINEE MONGKOLSRI
104332341

LIMITATIONS AND FUTURE WORK

Algorithm

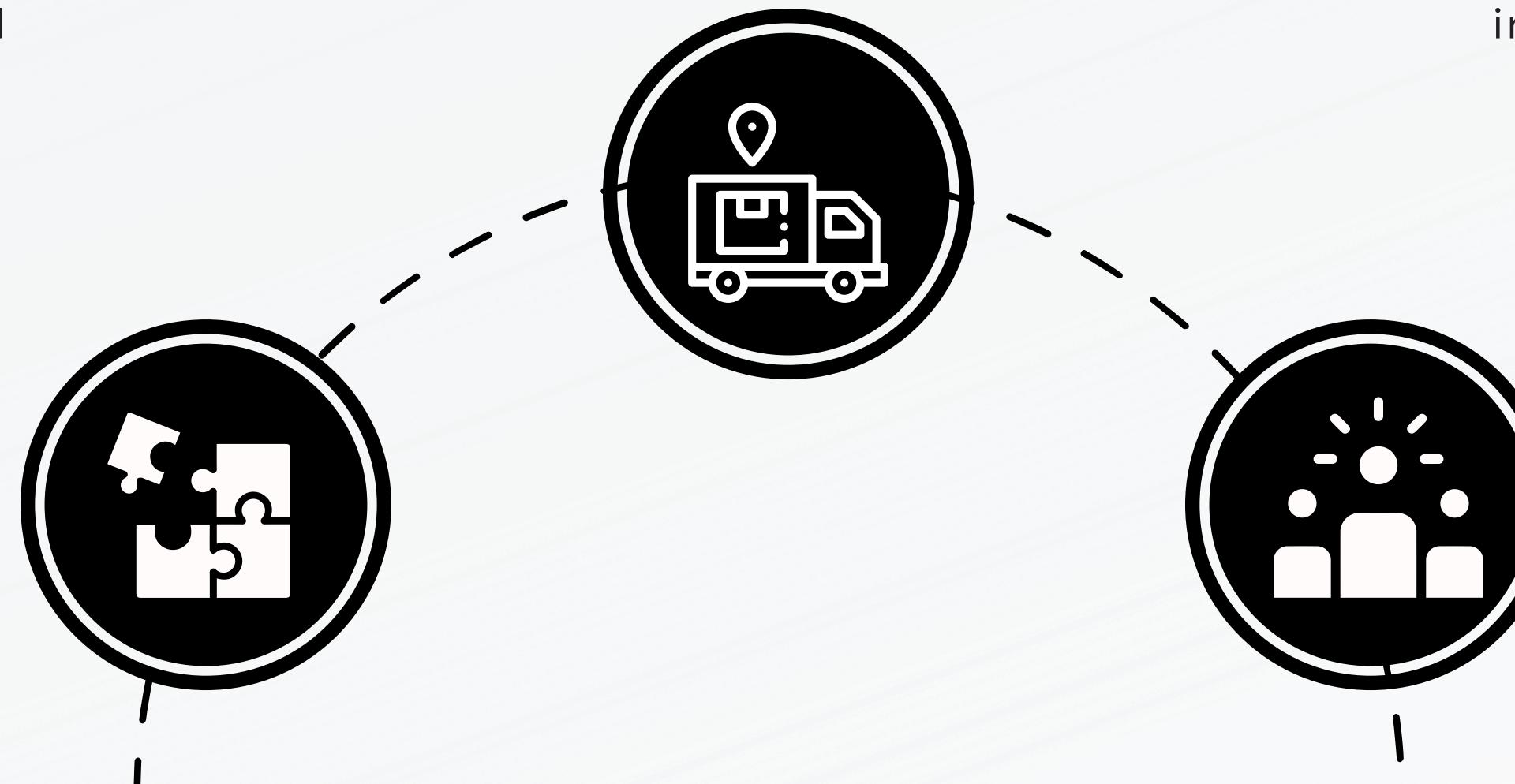
The algorithm is designed to match users by analyzing key variables such as time, location, and preferences.

Location tracking

This feature provides real-time location data to monitor user movement and determine travel routes.

User experience

The system focuses on user interactions like login and navigation, providing a basic interface for accessing features.



PRESENTING:

WILASINEE MONGKOLSRI

ALGORITHM

Current Status:

- Users are matched based on location and nearby users using displacement.
- Displacement is periodically aligned with real roads.

Future Improvements:

- Match users based on actual travel routes and traffic conditions.
- Consider time periods, traffic variations, and travel times to avoid inefficient matches (e.g., users on different coasts or separated by obstacles like mountains).



PRESENTING:

WILASINEE MONGKOLSRI

LOCATION TRACKING

Current Status:

- No user location tracking in place.

Future Enhancements:

- Add location tracking to record user movements after matching.

Benefits:

- a. Use real travel data to refine the algorithm.
- b. Analyze matching results to evaluate impact on traffic, energy use, and environmental benefits from shared travel.



PRESENTING:

WILASINEE MONGKOLSRI

USER EXPERIENCE

Current Status:

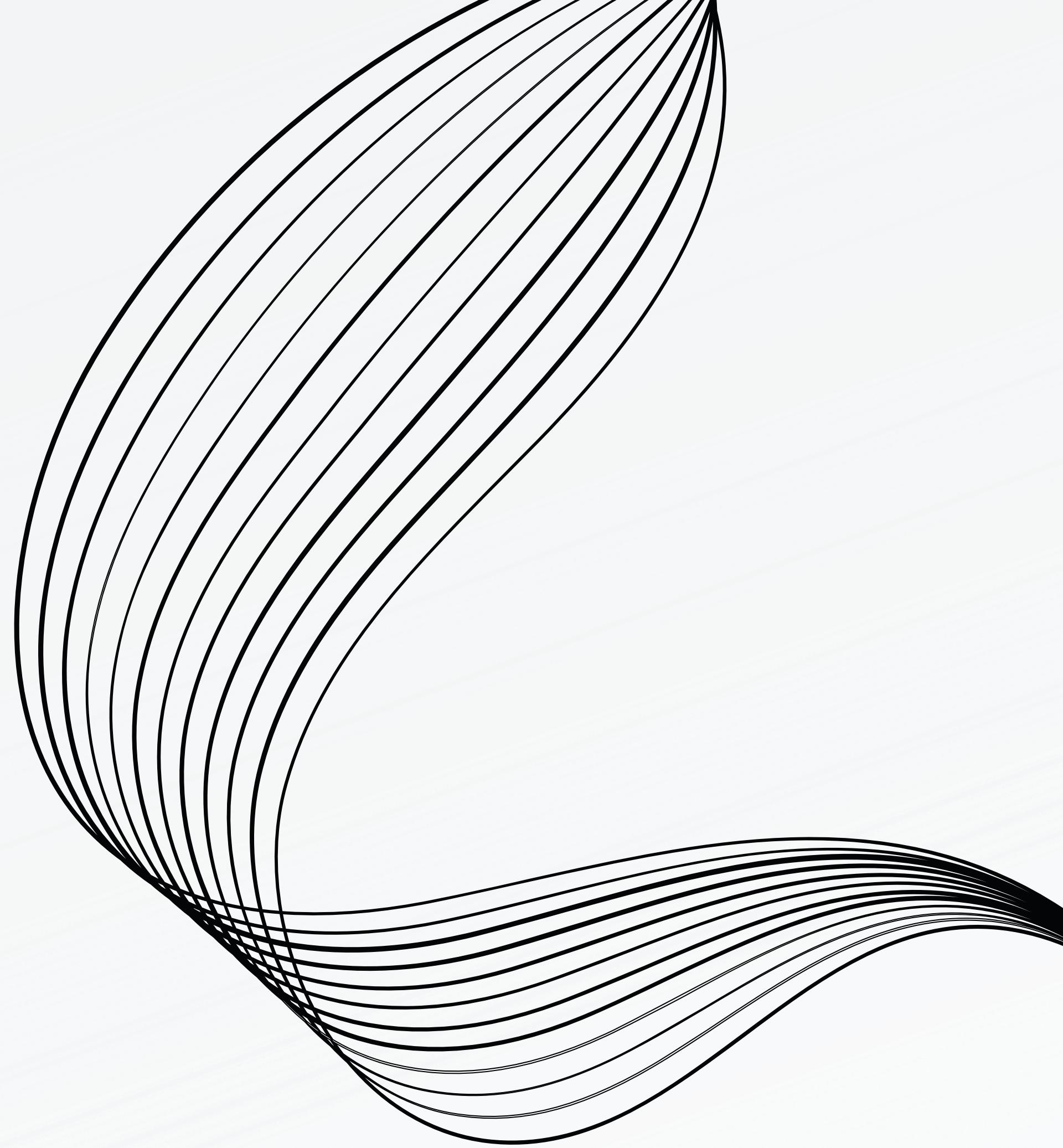
- Developed a screen for web usage.

Future Improvements:

- Add mobile or app support for easier access.
- Enhance user engagement by introducing reward points for traveling with others.
 - Points can be redeemed for skins or product discounts, encouraging energy-saving and eco-friendly behavior.
 - Potential collaboration with sponsors to offer rewards.



THANK YOU



Q & A

