Initial Plan
CM3203 One Semester Individual Project (40 credits)

Ridesharing Android Application
with privacy feature for extending the location range of the picking up and the destination points

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Project Description

These days more and more people are using their cars to commute on daily bases. A research shows that the average car occupancy is 1.5. This shows that commuting is a journey during which the people mainly travel alone in a car which can carry around 4-5 people. This inefficient way of travelling in the cities leads to several big problems that can be noticed. One of the major ones are the traffic jams that can be seen in the hours when the people usually go to work or go home after work. Another very serious consequence caused by the big number of cars on the road is the air pollution in the urban areas.

The application which this project is aiming to develop will try to increase the average car occupancy by allowing people with common destinations (living and working close to each other) to share their ride.

There are already several applications which are trying to resolve this problem, but they all forget one other issue which is of big importance these days - privacy. Most applications allow the user to post their incoming journey to the drivers around them with fixed to the point addresses of the pickup and drop off points, instead of making this available only for the approved driver and making it disguised during the search process. The application that

this project will introduce to the market will have the feature of hiding the real addresses and allowing the users to be a little bit more secure when using such private information.

Project Aims and Objectives

Aim

Design simple and aesthetic user interface.

Steps needed for the aim to be achieved

- Research other similar projects in order to see the strong and weak points of the user interfaces. Check which design elements lead to good user experience.
- Design a sketches of all the screens needed for the application with Sketch.
- Evaluate the design by getting reviews from other people.
- Re-design the initial sketches so that a perfect user experience can be achieved.
- Transform the sketches into views of the mobile application which are then interacting with the back-end services.

Aim

Develop a system which allows user to create a journey by picking up initial and destination points and uploading the journey to a system which distribute it to other users having common start and end points in order two similar routes to be matched.

Steps needed for the aim to be achieved

- Create an API which needs to handle the journeys generated by the users.
- Explore Google Maps API and the different ways that it can be customised for the purposes of the application.
- Develop an algorithm for comparing similarities between the different routes so that two users can be matched together for a journey. (part of the API)
- Write unit tests and test the API with them.

<u>Aim</u>

Add a social network capabilities to the application by allowing each user to add people they like travelling with as "friends". Create a feature for private communication between them.

<u>Steps needed for the aim to be achieved</u>

- Research which one of the following two (Auth0 and Firebase) is better for authentication in our case.

- Authenticate the users and build user profiles based on the user information and habits.

- Add social network capabilities like adding people you like travelling with as a "friends".

- Developing private communication (chat) between the users with Firebase.

- Write unit tests which need to test the speed and the correctness of the modules above.

<u>Aim</u>

Add a private feature which allows the user to disguise the start and destination points by randomly selecting a point within a given range from the original one.

<u>Steps needed for the aim to be achieved</u>

- Research which is the best way to disguise user address without making the masked point too far from the initial one.

- Find a good random function for the purposes of the application.

- Evaluate how well the feature is working.

<u>Aim</u>

Add a feature which allows the application to recognise when two users are together. Can be created by QR codes which are scanned by the users.

<u>Steps needed for the aim to be achieved</u>

- Research which is the best way to recognise when two users are together without the need of GPS or bluetooth. Check what is used by other similar applications for this feature.

- Develop the feature according to the best approach found from the previous step.

The 5 aims given above can be prioritised by the MoSCoW method in the following way:

- **Must** have:

  • Design simple and aesthetic user interface.

  • Develop a system which allows user to create a journey by picking up initial and destination points and uploading the journey to a system which distribute it to other users having common start and end points in order two similar routes to be matched.

  • Add a private feature which allows the user to disguise the start and destination points by randomly selecting a point within a given range from the original one.

- **Should** have:

  • Add a social network capabilities to the application by allowing each user to add people they like travelling with as "friends". Create a feature for private communication between them.

- **Could** have:

  • Add a feature which allows the application to recognise when two users are together. Can be created by QR codes which are scanned by the users.

Work Plan

- 23.01-30.01 - Initial plan

- 31.01-10.02 - Research other similar projects in order to see their strong and weak points of the user interface and design a sketches for the application with Sketch.

- 11.02-14.02 - Evaluate the design

- <u>15.02-22.02 (milestone)</u> - 2-nd stage of sketching & Improving the design

- 23.02-01.03 - Authentication with Firebase or Auth0- Login and register screens and creating the user profile.

- 02.03-05.03 - Explore Google Maps API

- 05.03-12.03 - Plan a journey functionality implementation & Google maps integration

- 13.03 - **Meeting with the supervisor**

- <u>13.03-24.03</u> (milestone) - Develop API which handles the journeys created by the users including algorithm for getting the similar journeys and matching the users.

- 25.03-28.03 - Build user profiles based on the user information and habits.

- <u>28.03-04.04</u> (milestone) - Connect users and add chat functionality

- 04.04-10.04 - Adding privacy feature for the location of the endpoints

- 10.04 - **Meeting with the supervisor**

- <u>10.04-18.04</u> (milestone) - Add system which recognises when two users are together. Can be created by QR codes.

- 18.04-25.04 - Testing and improving

- 20.04-05.05 - Final report writing