

USER CENTRIC DYNAMIC RIDESHARING ANDROID BASED APPLICATION WITH ROBUST PROTECTION SYSTEM

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Abstract— “Social Commute Sharing” is an android application that enables the commuters to share their commute with his/her friends from the commuter’s phonebook. This application provides features like creating rides for friends, finding available rides in a certain kilometer radius, requesting for a ride, in-app chat system through which you can communicate with the driver before taking the ride, SMS based helping system (SOS) for emergencies, and much more. SMS based helping system (SOS) enables user to alert family, friends, police and anyone in predefined km radius in case of danger at a press of a button. The main objective of this application is to enable carpooling with much more security through integrated SOS alert solution and at the same time it addresses problems like air pollution, traffic congestion and economical concern of commuter.

Index Terms— Ridesharing, Social, Commute, Carpool, Android, SOS.

I. INTRODUCTION

The purpose of this application is to help employees, students, co-workers commute in a user friendly and cost-effective way. Anybody who travels together or share the same route can take the advantage of this application and can ensure the safety too. There is a chat window for users to communicate with each other and also has the feature of broadcasting the messages.

- This application is helpful for all the age groups who work at same place or who study in same college or who travel to the same place.
- User interface for users to interact with their friends or other users.
- User interface for seeing the users who are moving.
- User interface for broadcasting rides.
- Option to send an SOS (Save Our Souls) to emergency contacts.

There is an inbuilt GPS functionality which will help the device to connect with the GPS and store the location data in the android internal database. This functionality will store the GPS co-ordinates in the centralized database but won’t be visible to the user for the confidentiality purpose. Chat messages will also be stored in the centralized database but for the time limit of 10 days.

II. SCOPE & RELEVANCE

There’s nothing wrong with asking for help from your friends. Social Commute Sharing Application lets you broadcast your intent / request to commute to everyone in your contact list of the application and instantly connect with people looking to reduce cost of their commute or who are heading in the same direction. The people driving you around or travelling

with you are your friends or friends of friends within your own social networks. You get to communicate directly with the person you’ll be sharing a car / public transport with for peace of mind and sense of security ^[1].

Our payment options are negotiated directly between drivers and passengers in case of private vehicles, which gives you the flexibility to split a tank of fuel, have parking fees covered or work out a barter system that suits everyone. Of course you can still exchange cash if you like – but you determine how much you’re paid, when and how you get your money ^[1].

To improve air quality and mobility, new approaches need to be taken to make alternative forms of transportation attractive and affordable to commuters. Approaches such as carpooling, that move more people using existing infrastructure and vehicles more efficiently, are an option. Traditional carpooling, however, is too limiting to accommodate the unconventional schedules of today’s workforce, where many commuters will only respond to flexible commuting options ^[5].

Some of the major objectives of the proposed application are as follows:

- To develop a cost effective commute system.
- To provide a safe way to commute for women who work late shifts.
- To provide an environmental friendly way to commute.

The application has been designed after careful research in simplicity and user experience so that even a lay person can use the application without any problem. The plan is to include all modes of transportations like auto-rickshaw, taxi, car, bikes and so on.

A comprehensive categorization of the obstacles deterring greater rides haring participations is provided in [3]. These are a series of economic, social behavioral, institutional, and technological

challenges. Economic challenges include imperfect information, high transaction costs, subsidies favor in got her transport modes, and decreasing costs of vehicle ownership.

The points such as “how the changes in the technology infrastructure of our society may soon make it possible to reduce some of the barriers that have limited the appeal of instant ride sharing” is discussed in [4]. The changes are, namely, the wide spread use of smartphones and the GPS systems integrated in them, the increasing computational power “for dynamic route matching of drivers and riders”, and “the development of reputation systems on the Internet for maintaining trust among strangers”.

III. PROPOSED SYSTEM

The users will have our developed carpooling android application installed in their android smart phones. The carpool process will be initiated by registering the users using one time passwords (OTP). Then users will be able to create and share rides. The android application consists of the following activities.

A. User account creation

In order to use the application, user has to create an account which consists of following steps:

Step 1: Enter name, email and mobile number as input to the android application in the given text boxes and then click on “NEXT” button.

Step 2: These details will now be stored in the server and the server will generate an OTP.

Step 3: Server will send SMS to the user which will contain OTP.

Step 4: The android application will automatically detect the SMS and will automatically enter the OTP in the application. Incase if it fails to detect the SMS then user have to manually enter the OTP in the text box of the verification screen.

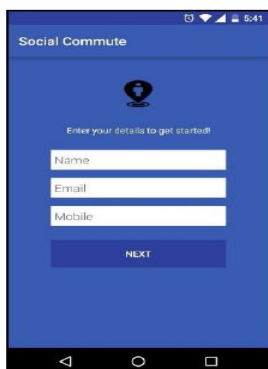


Figure 1: Registration Screen

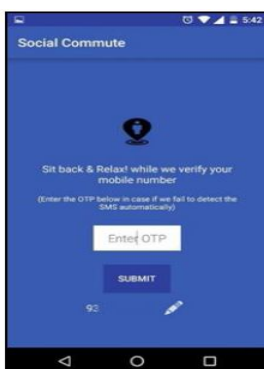


Figure 2: Verification Screen

Step 5: Server will check in the centralized database and will see if user’s entered OTP matches with the database OTP or not. If it matches then the user account will be successfully created.

B. Home Screen (Commuting Tab)

Home screen consists of all the user’s friends with their profile picture and name, who are using this android application along with a message saying “Near You” or “Travelling”. If user’s friend is not moving and within 10 km distance then “Near You” message will be displayed else if the user’s friend is moving then “Travelling” message will be displayed. Along with that the application will show the distance between the user and his/her friend. If the distance between user and his/her friend is less than 1 km then it will not show the exact distance rather it will show “< 1 km”. If none of the user’s friends is within 10 km radius then a message will be displayed saying “No Friends within 10 km range”.

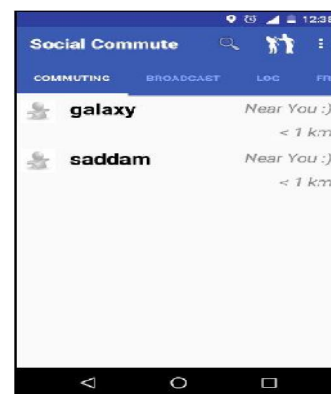


Figure 3: Commuting Tab

C. Creation of ride

The creation of ride consists of following steps:

Step 1: Car owner will enter the source, destination, starting time, mode of transport and available seats as input to the android application.

Step 2: This ride creation request will be transferred to the server and will be stored in the centralized database.

Step 3: Now ride is created and ride seekers are able to see the broadcasted ride.

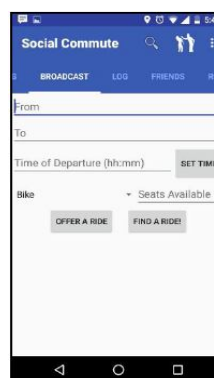


Figure 4: Creating ride

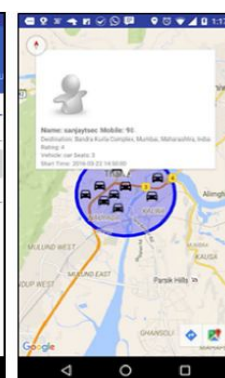


Figure 5: Finding ride

D. Requesting ride

Requesting a ride can be done as follows:

Step 1: Ride seeker will click on the “Find Ride” button in the “Broadcast” tab.

Step 2: This will open google maps and will pinpoint all the available broadcasted rides within 3 km radius and will have all the information about it.

Step 3: The ride seeker can choose to call, chat with the broadcaster and / or send him a ride request.

Step 4: The ride broadcaster will get notified about the ride request through in-app notification and SMS.

Step 5: If the ride broadcaster approves the request the ride will be confirmed.

E. Chat

In-app chat system which allows a user to communicate with the driver before initiating with the ride. So, that the user (i.e. ride requester) can know how much money he/she has to pay. User can also know some specific details like whether pets are allowed for the ride or not, smoking is allowed or not, etc. User can chat with his/her friend through the in-app chat system by just clicking on the name of his/her friend either from the "Commuting" tab or from the "Friends" tab. User can also view the profile picture of his/her friend by clicking on the name of his/her friend from the chat window.



Figure 6: Chat Screen

F. Log Tab

The "Log" tab allows the user to keep track of all the rides that he/she has taken or is pending for acceptance. "Log" tab contains a list which has ride details and these ride details consists of driver name, mobile number, source (from), destination (to), starting time of the ride, rating of the ride, and a message to notify the user whether the ride is accepted or rejected.

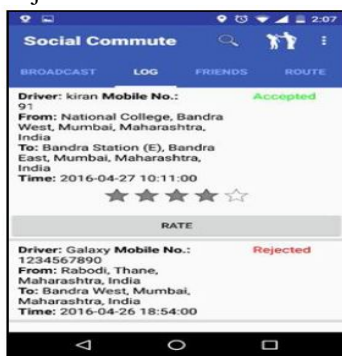


Figure 7: Log for accepting/rejecting ride requests and rating the rides.

G. Rating a ride

Ratings is one of the key factor in knowing whether the driver (i.e. ride broadcaster) is a trustable and good driver or not. The more the ratings of a driver the better and safer is the driver. You can see the ratings of the driver in the "Find Ride" window which is discussed above. The maximum rating a driver can get is 5. Only ride requester can rate a ride. In order to rate a ride, the user (i.e. ride requester) has to follow the below steps:

Step 1: As soon as the ride broadcaster approves the request of ride requester/seeker, a rating section will be visible in ride seeker's "Log" tab.

Step 2: Ride seeker can give rating to the ride broadcaster out of 5 by selecting stars and then clicking on "Rate" button.

Step 3: Ride broadcaster can now see how much rating he/she had got.

H. Friends Tab

"Friends" tab contains a list which consists of all the friends of the user who is using this application. The application takes the contact list of the user from the phonebook of the user's mobile device and checks in the centralized database of the server for existing users. The server then sends back the list of existing users which are there in the user's contact list and then the android applications store this list and displays it to the user in the "Friends" tab. If this list is empty then there will be a text displayed saying "No Friends found".

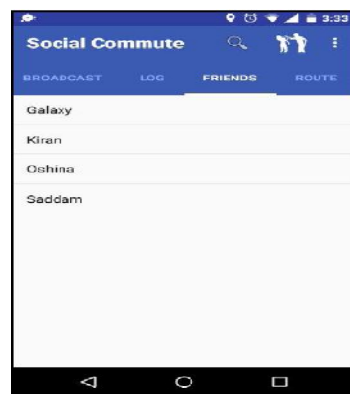


Figure 8: Friends tab

I. Route Tab

The "Route" tab serves the purpose of finding the best route to travel between the source and destination. "Route" tab consists of a text box in which the user can enter its desired destination and then can click "Find Route" button. By doing this, the application will automatically open the google maps driving navigation from the user's current location to the desired destination. Along with that, the "Route" tab also consists of a text box where the user can enter vehicle number of the driver's vehicle in which the user is currently commuting. This vehicle number is useful for emergency purpose which is described in the next section.

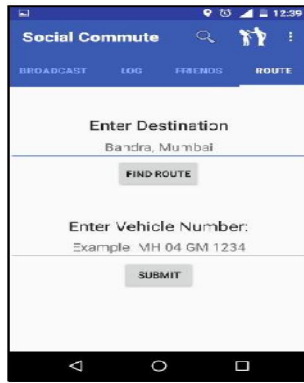


Figure 9: Route tab

J. SOS request

SOS (Save Our Souls) is a distress signal used to help someone in danger. If by any chance the user (i.e. ride requester) senses some danger from the driver, then the user can use the SOS feature of the application. This SOS feature will send SMS to all the emergency contacts that the user had saved, police helping number and to all the users of this application who are within 1 km distance from the user who had asked for help. Sending SMS to emergency contacts also is quite important as there may be a scenario when the police helpline number is getting too many SMS and they cannot respond to it immediately. In such scenario, the emergency contacts which can be user's parents, friends, or someone who the user trusts the most will try their best to help the user and remove the user from the danger. Also, this application covers one more scenario where the emergency contacts or police helpline are not able to help immediately. In such case, the user can get help from the people around him/her who are willing to help the user who is in danger because the application also sends SMS to all the people who are using this application and are within 1 km distance from the user which is in danger. In case of emergency the following steps can be performed:

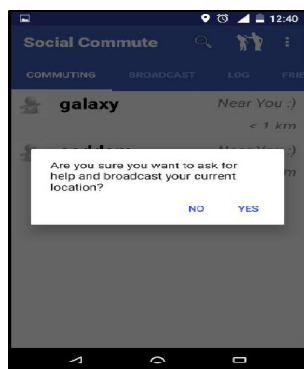


Figure 10: SOS request confirmation

Step 1: The user can click on the SOS button which is there at the top of the application's screen.

Step 2: The android application now prompts the user for confirming whether he/she wants to send SOS request.

Step 3: SOS request is sent to the server and the server sends SMS to all the users who are in 1 km proximity to the SOS requester, emergency contacts and also to the police helpline number. The SMS consists of SOS requester's name, number, tentative latitude and longitude, driver's vehicle number (optional), and a link to the google map pinpointing the location.

K. Search Friends

User can click the search icon to search for his/her friends who is using this application and is in his/her contact list. When a user clicks the search icon, a text box appears on the left hand side of the search icon which says "Enter Friend's name". In that text box the user can enter his/her friend name and a new window will open which will contain the search results.

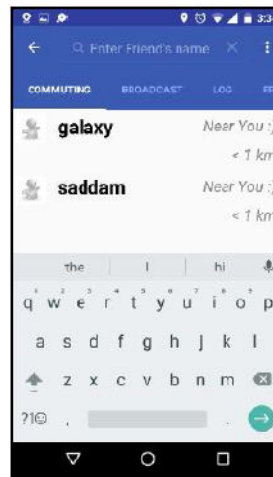


Figure 11: When user clicks search icon



Figure 12: Search results



Figure 13: Settings screen



Figure 14: Add Emergency Contacts screen

L. Settings

There is a settings icon (i.e. 3 dots icon) on top of the application's screen. When a user clicks this icon, a dropdown list will appear which consists of 3 options:

1) *Feedback*: If a user wants to send a feedback regarding this android application then the user can

click on the “Feedback” option from the dropdown list and the application will open the user’s email client and then user can send an email to the developer of this android application.

2) *Suggest Place*: This option lets the user know about the popular ride taker spot which is near the user’s current location.

3) *Settings*: Settings option will open a new window which consists of options such as Profile, About and Add Emergency Contacts. “Profile” option lets user set a profile picture for his/her account. “About” option displays the application’s icon along with the current version of the application. “Add Emergency Contacts” option opens a new window which allows the user to add emergency contacts which will be notified by SMS by the application when the user is in danger and uses SOS feature. User can add upto 5 emergency contacts.

CONCLUSION

The participation in the ridesharing programs is low due to the factors such as safety and lack of proper incentives which has been addressed by our application. There are also significant economic, social, and institutional issues that any ridesharing program has to address and overcome in order to be successful. We believe that our ridesharing application carefully tailors to customers concerns and needs. Also, by integrating social networks, targeting universities and highlighting social benefits, there is an opportunity to successfully and widely implement our creative ridesharing application with a possible business cases.

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