ABSTRACT

Today traffic congestion, air pollution, has been a serious problem in many areas around the world. Carpooling is one of the most effective solutions of this type problem. Carpooling means sharing of car journey. It also known as lift sharing or ride sharing. Carpooling will help in reducing the problems of traffic, toll cost, also help in controlling pollution and resulting in green environment. In this paper, an improved carpool system is described in detail and called carpooling using genetic algorithm (CUGA) which provides car poolers the use of the carpool services through an android phone device anywhere and at any time. We apply advanced genetic-based carpooling route and matching algorithm for finding optimal solution within a time. Genetic algorithm are also used for finding intermediate route. We use intermediate route for solving the problem of empty seats. Intermediate route means route within a route. It is a mobile application that runs on android enabled mobile phone. It interacts with a central server and provides processed information to the users. Carpooling being a mobile application provides portability and requires low maintenance. It reduces cost of travel, traffic on the road, air pollution and ultimately global warming.

Keywords— Android, Carpooling, Comment, Genetic Algorithm, Intermediate route, Rating,

I. INTRODUCTION

Recent economic development has resulted in many urban areas and industrial growth leading to rapid increases in the number of vehicles on roadways and, thus, serious traffic congestion, air pollution problems in large areas also fuel problem around the world. Severe traffic congestion can have many detrimental effects, such as time loss, air pollution, increasing toll cost and increased fuel consumption. Public transportation systems have the capacity to decrease traffic congestion, air pollution but offer less flexibility, comfort, freedom and not useful for intermediate route. However, each car usually transports just one or two individuals, resulting in many empty seats. This represents an underuse of available transportation resources, a problem whose solution will require considerable effort. Carpooling (also called as car-sharing, ride-sharing, lift-sharing), is the sharing of car journeys so that more than one person travels in a car. By having more people using one vehicle, carpooling reduces each person’s travel costs such as fuel costs, tolls cost, and the stress of driving. Carpooling is seen as a more environmentally friendly and sustainable way to travel as sharing journeys reduces air pollution, traffic congestion on the roads, and also reduces parking spaces. Authorities often encourage carpooling, especially during high pollution periods and high fuel prices.

In carpooling system intermediate system are used for solving the problem of empty seats. User or driver share their cars with one or more people who have similar transportation routes. By using intermediate route system we can reduce number of empty seats in these vehicles, occupancy rates are significantly increased. Consequently, fewer vehicles would be required to transport the same quantity of commuters to their respective destinations, resulting in substantially fewer cars on the road. Other carpooling benefits include reductions in travel cost, parking, and vehicle emissions.

Through the use of android devices, drivers and passengers can instantaneously access real-time carpool service via the structure of CUGA, driver and passenger uses android phone for accessing real time carpooling system. Genetic based route matching algorithm are very useful for obtaining optimal result within a reasonable amount of time.

Carpooling system uses genetic algorithm for route matching. It is also used for searching intermediate route.

II. LIMITATIONS OF PREVIOUS SYSTEMS
There are many websites and application are available for carpooling but these application or websites fail during the actual working. Carpooling websites are not flexible. The current carpool application is not able to fulfil the requirement which are listed below:
- Intermediate route are not present
- User rating
- Optimized journey search
- Android application
- User can select no. of seat
- Security issues.

There are different websites which help in carpooling but fails at some level while dealing with issues like payment, intermediate route, security and real-time tracking.

III. PROPOSED SYSTEM

To overcome the drawbacks of previous applications or system, we proposed a application for android users. In our system we are mainly dealing with security issues and empty seat which resulted in failure of previous systems. To deal with security issues we are using a feedback and rating system and empty seat for we are using intermediate system. The both user are given a provision to rate and comment each other. The system will be communicating with cloud database server which is having Mysql database. The system will work in a two-way communication between driver and passenger and thus creating a flexible environment. The details which are given by passenger will be displayed on driver android phone and vice-versa. The user can booked the seats by using android phone device. The reason behind choosing Android system is it is more popular among users and is less expensive. Android is a linux based operating system. The applications can be easily downloaded from the Google Play or internet and can be used whenever want. Inspired by the use of android applications in different sectors, we tried to develop an application which will help in conserving environment and also in reducing traffic congestion problems toll cost problem.

Fig. show how the system actually works and interacts. The main module are the admin module, cloud module and user module.

1) User Module

Carpooling is an android based mobile application that works on all android enabled phones. As it is a mobile application it is easily portable, handle and requires low maintenance.

There are two type of user in our system one is passenger and another is driver. The android application will be installed on both the use devices and they will interact with each other. In this we are giving a detailed description about how exactly the user and passengers will interact each other. The passenger and driver has to register themselves if they are using the application for first time. User need to provide certain mandatory information about identity such as driving license, identity card etc. for security purpose. After registration successfully system provide login id and password for both the user. If they are already registered they have to login using their login id and password. After login, they have to select whether they are driver or passenger. If he/she is a driver then the details of carpool will be filled and it will be stored in cloud database. If he/she is a passenger then the details will be displayed on their respective android phones. After successful completion of journey, the driver as well as passenger will rate and comment and this will be stored in cloud database.

2) Cloud Module

Cloud module are use for storing the information of user module. In cloud module genetic based route matching algorithm are present for matching both the user driver and passenger information.

Genetic algorithm consists of two important categories: 1) Evolution initialization (EI) and 2) Genetic evolution (GE).
1) Evolution initialization (EI)

The EI module initializes chromosomes using chromosome representation and greedy population initialization to effectively generate initial solutions to the carpooling. Carpooling requirement properties are expressed by the EI module through the chromosome representation procedure, according to driver and passenger requirements. Those candidates of the initial population pool that are determined to be feasible matches are then generated by the greedy population initialization procedure via distance based heuristics. Upon generation of effective initial solutions in the EI module.

Fig. 2: Genetic Based Carpool Route and Matching Algorithm

2) Genetic evolution (GE)

Genetic evolution use to find optimal solution by taking the output of EI module as input. The proposed GE module accurately determines optimum solutions to the route matching by heuristically simulating natural evolution through six proposed procedures: First, the route and matching evaluation takes place, after which elitist chromosome selection occurs. Then, exceptional trait crossover is implemented, followed by optimization-oriented mutation and invalid chromosome repair. Finally, the early stop option is employed.

Chromosome Evaluation procedure calculates the fitness value and to determine the quality of each chromosome. We will find the most efficient route for picking up and dropping off driver for each corresponding passenger, from that we can calculate fitness value. In chromosome Selection procedure selects chromosome for next generation according to fitness value. Chromosome Crossover is utilized to recombine the chromosomes of selected parents thus generate a more suitable carpooling match. Chromosome Mutation is used to maintain population genetic diversity.

Cloud module are use for following purpose-
- Authenticate user
- Process user request
- Apply genetic algorithm
- Find optimum journey

3) Admin Module

Admin module are use monitoring and controlling of the system also it manages user information. It is used to adding retrieving new user. It also helps for managing cloud database. Admin module are use for following purpose-
- Add or manage location
- Add or manage user
- View route and route information

IV. CONCLUSION

In this paper, we presented a solution to an increasing traffic problems. It is an application aimed at reducing fuel consumption, travelling cost, toll cost and reduce the air pollution. It is also help for solving parking space problem. It also helps to meet new people and helps in reducing stress from Driving.

REFERENCES