

# Carpooling Using Genetic Algorithm

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## Abstract:

Now a day's traffic congestion is a main issue all over the world so we are proposing a carpool system that will increase the no of occupation seats by decreasing the no of empty seats. In carpooling, drivers share their vehicles with one or more additional riders whose destinations are similar. It is good to traffic congestion, but also an environmentally sound transportation method. We are using Genetic Algorithm for matching of which seekers goes with which driver. Genetic algorithm is used for large no of users so it gives proper match. There are 2 models one is android mobile i.e. client and another is database.

**Keywords** — Genetic Algorithm, Android.

## I. INTRODUCTION

Due to increased in economic development in recent times rates of industrialization and globalization increased. As a result of that more no of cars are running on roadways and that led to increase in traffic congestion problems. And it is also affect the environment. In a city area there are different options are available for public transportation but the there are the disadvantage of comfort level. User may travel using personal vehicle but it will used for only one or two person. And it will only lead to the traffic congestion problem. Carpooling helps not only the traffic congestion problem but also it helps to increase the no of occupation rate. So it is an effective solution for our problem. In carpooling, drivers share their vehicles with one or more additional riders whose destinations are similar. This may reduce no of personal Cars.

## II. BASIC CONCEPT

The main motive of carpooling is to provide an effective solution to a traffic congestion problem by share their vehicles with one or more drivers whose destinations are similar. It helps environment by

decreasing the rate of empty seats by increasing the rate of occupation. There are few of carpooling systems which are already present in the market but they are web based and simply have option to send a request option for a specific date and time and give a specific result. Some of the carpool uses the feature of several systems feature a digital GIS mapping ability by which to provide a visual tool with accurate location information to users. Unfortunately, these systems are neither efficient nor convenient for users who need real-time carpool matches and no security present. So we are proposing an intelligent carpool system which gives proper matching using genetic algorithm.

## III. EXISTING SYSTEM

Many carpool service systems have been proposed which can be divided into two broad categories based on their features. The first of these comprises systems which are web-based and which transmit carpool information to an online community platform. One such system is Carpool Global which supplies an interfacing service for willing drivers and passengers. These Systems do not include Location Display of user (GIS) & not real-time. The second category of carpool service

systems provides digital GIS support in order to match requests via location information an example system of this category is the ShareYourRide platform by which users can readily submit carpool requests and offers via its map-based interface. In addition, ShareYourRide supplies a GIS-based routing service. This system has limited functions in situations requiring instant service due to the fact that it cannot support the use of Global Positioning System (GPS) handheld devices which provide pertinent information regarding user location. Many carpool systems have been developed to decrease lessen traffic congestion .Of these, many systems supply simple carpooling functions including the option to send requests for a specified date and time, and search for applicable users. In addition, several systems feature a digital GIS mapping ability by which to provide a visual tool with accurate location information to users. Unfortunately, these systems are neither efficient nor convenient for users who need real-time carpool matches. Our proposed system incorporates mobile communication technology with GIS to create a carpool service which is operable in real time. Subsequently, users can instantly submit carpool requests to the intelligent carpool system which reflect their current locations via the use of smart, handheld, communication devices which feature GPS capabilities. The system will use the carpool matching algorithm to generate and return match results within a short amount of time.

#### **IV. SYSTEM ARCHITECTURE**

Our architecture includes 2 main modules i.e. Android (client) and other is Cloud (Database).

##### **A. Android**

Android mobile is the client which is used by both driver and seeker. In this module there is Google map for showing the client map on their mobile and Location manager for locating their location. Where for communicating with another module we use Communication manger.

Communication manger also used for communicating with all three elements of android

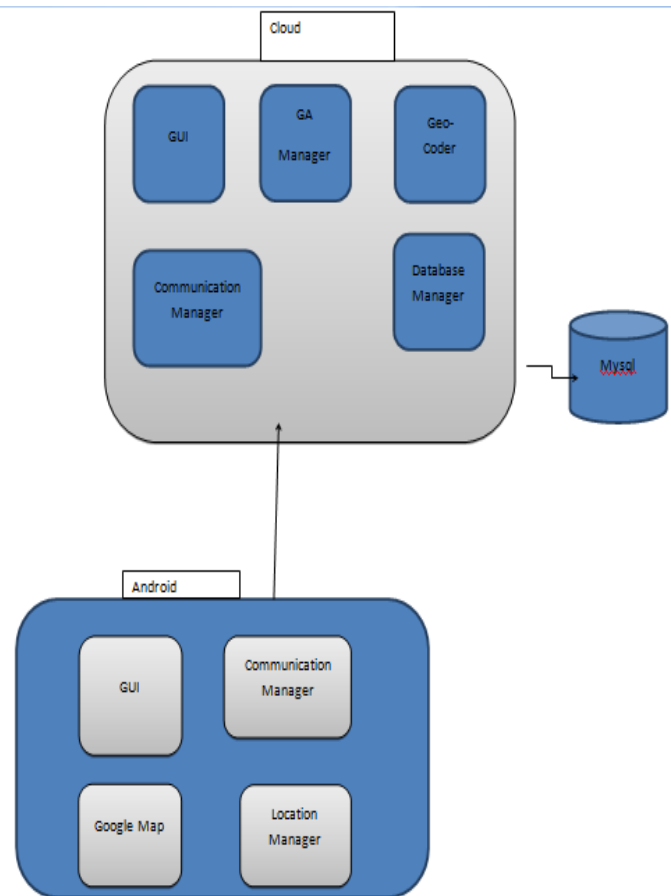


Figure 1 System Architecture Diagram

module.

GUI is Graphical User Interface for Driver and Passenger. Through Communication manager Android can communicate with Cloud.

##### **B. Cloud**

This is 2<sup>nd</sup> and main module in our architecture. Communication manager used to communicate with Android. GA manager is genetic algorithm which we are using for matching of drivers and seekers. Geo Coder is nothing but used for finding Latlong of user. Database manager is used for maintaining database and MySQL is database.

All the manipulation is done in this module. Here all the constraints of users are tested and matching is done by GA manager.

## V. ALGORITHM

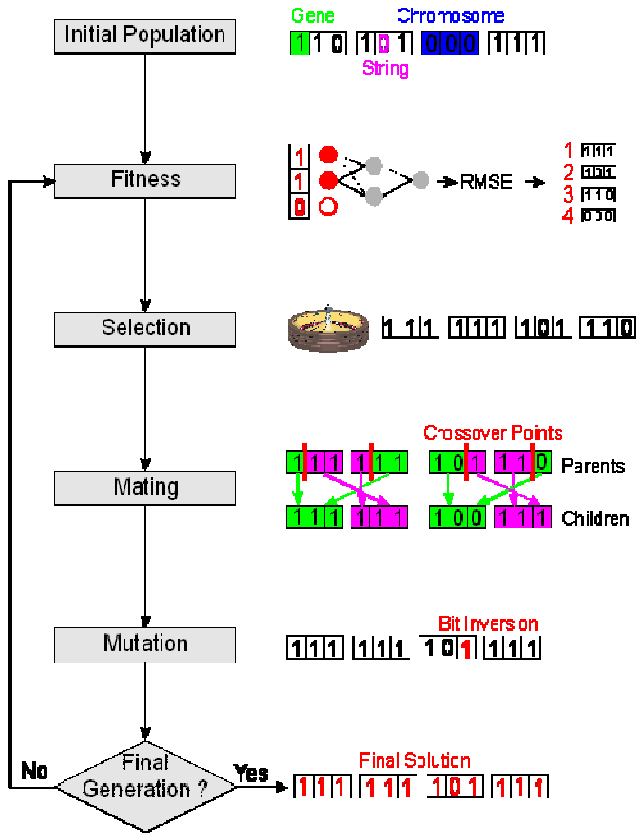


Figure 2 Genetic Algorithm

The figure shows the Genetic Algorithm. It has 5 steps.

### A. Initial Population

In the initialization procedure, each passenger is randomly chosen and assigned to a driver in the assignment layer of a chromosome. The chosen passenger is marked to prevent the passenger from being assigned twice.

### B. Fitness

To find the quality of the chromosomes in the population the *fitness function* is used to determine the travel cost for each driver.

To calculate the fitness value we need to find the most efficient route for picking-up and dropping off passengers for each corresponding driver.

### C. Selection

The first phase involves sorting the chromosomes into a descending order according to their fitness values, And selecting those with the highest values in the population. This gives with the highest fitness values from one generation to the next

### D. Mating

After the optimal chromosomes have been selected, the chromosome crossover procedure is utilized to recombine the chromosomes of selected parents to simulate the natural process of evolution.

### E. Mutation

It is used to change the allocation of the passengers mutually.

## VI. CONCLUSIONS

This paper proposes an intelligent carpool provides an environment in which users can readily search for and locate carpooling alternatives in any location and at any time. The system is developed to provide the service-oriented carpool computing, and integrates abundant global geographical information provided by web services of open GIS for increasing the applicability. After receiving the carpool requests of drivers and passengers from the MC, the respective requirements of drivers and passengers in corresponding radial regions will be matched through the carpool route and matching algorithm of the carpooling.

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