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Leveraging Route Saver Based On Location Service in Carpooling System Using K-NN Algorithm

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Abstract: *Travel time forecasting is considered as theme of Intelligent Transportation System(ITS) particularly in the topics of advanced traffic management systems (ATMS) and advanced traveler information systems(ATIS). Interests of travel time forecasting model is revived due to LBS(location based service) which is rapidly increasing. Carpooling is also an environment friendly app based on LBS also known as car-sharing in which one can travel to their destination while sharing the vehicle with other passengers. The logic behind this carpooling is, vehicle owner deploys the vehicles sharing application and any passengers like to share can consume it .When more people travel together in one vehicle it give the impact that fuel costs, tolls and the stress of driving will be reduced .Additionally, it frees from earthly gases in the air and traffic congestion.. During high fuel prices and high pollution periods, making use of the car pooling system is an intelligent decision. This proposed system has three modules like user module, LBS module and route saver module. First module allows users to register with destination point they want to reach, number of seat needed along with their payment option. LBS module cluster the user details based on destination point, and matching payment option. The last module frames the intermediate route for the destination point and display the reservation chart of the vehicle allotted to the user using k-NN algorithm .Thus, pre-registration ensures security as only identified people get into the vehicle so that trust can be established. Thus the proposed carpooling system will be effective in reducing environment pollution and save a lot of space in the Parking lot*.

Keyword: *Carpooling*; *K-NN Algorithm; location based service*; *online Location API; Route saver;*

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1. INTRODUCTION

The Vehicular Ad-hoc Network (VANET) entails vehicles that have the intention to use wireless communication technology. In recent trends, VANET

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highlight the category of vehicles [4] control and safety precaution in software development pinned mainly to humanizing road safety, traffic efficiency, and maximizing the benefits of road users.

The carpooling application is intended for travelling people especially who prefer the best services in least amount, a cheaper affair and for girls safe who travel in night time. This application will permit the user to choose his/her role i.e. driver or passenger and then allow them to login the passenger and the driver will enter his location, destination and time of travel.

Transport management problem prevailing in capitals of India like Mumbai, Delhi, Kolkata and Chennai, should be finely tuned to remove the congestion, death rate due to accident and air pollution. As changes prevail in day to day life activity with increase in number of vehicles in proportional to its utilization, standard steps have to be taken in case mobility problem. The population also increases in which Delhi stands first and then follows the next cities. Additional to vehicles and population, the initiative steps should to be taken reminding the city's infrastructure, transport facilities availability, personalized regular vehicles utilization and its physical [8] appearance. Due to heavy traffic congestion, the drivers are crawling slowly which leads to consumption of oil, discharge of air pollution and enlarges the economic expenses.

Additional feature taken care to improve its facilities are:

- Independent location services(same app that survey for any [9] location living customer
- App enabled using social media accounts (like facebook, yahoo, twitter)
- Payment through mobile banking
- Location trips using Map Pickers

2. LITERATURE SURVEY

In this [1] proposal carries to furnish the concepts of clustering and security concerns in regards to optimization. Clustering in vehicular ad hoc networks (VANET) is subpart of the control schemes worn to make VANET global topology less dynamic. Our technique takes the sharing efficient parameter to create relatively constant cluster structure. The degree of the sharing among neighboring vehicles is the key criterion for constructing relatively stable clustering structure.

In general, vehicles uses the position data embedded in the periodic messages to build their neighborhood relationship. Usually, all the vehicles broadcast their current state to all other nodes within their transmission range (r). Therefore, two vehicles can be considered as neighbor if the distance between them is less than the total number of r-neighbors of a given vehicle is called the nodal degree of the vehicle. Our system is initiated with the slowest vehicle, later all the neighboring vehicles of this slowest vehicle that satisfy the sharing rules will be in the first cluster. The remaining vehicles will follow the same cluster formulation process to create other clusters. By extracting the velocity data surrounded in the periodic messages, any vehicle can determine whether it has the slowest velocity among all its neighbors within the communication range. The vehicle working slowly will negotiate to commence the cluster by sending a cluster creation to applicable one and confirm only its stable neighbors participate in this process.

Similarly the remaining vehicles do form the clusters depending upon the speed and direction. In order to execute the cluster algorithm, each vehicle is inferred to maintain and update the two sets of database that contain the IDs of the steady neighbors. At any time, among its stable neighbors, vehicle whose speed is the slowest is clustered.

2.1 Carpooling system KwiGo:

The carpooling system taken care to contain the entity like passenger modules and driver modules. Both the modules would share the common function registration, profile, trip checking and social media. Passenger modules has provision for trip checking for the categories like frequent, regular, reserved and driver payment details, whereas drivers has the administrator [9] option to create the trip categories they offer and passenger payment details.

2.1.1 Technology trailer:

1. *Google maps:* It provide map and direction service which gives the GPS coordinates of any location and distance between the GPS coordinates needed for further travelling and payment decision respectively.
2. *Social media:* for login, profile updation, location and individual authentication assurance.
3. Client and server side technology

2.2 Examples of Carpooling system

Additional examples for Carpooling application are Carma, BlaBlaCarand, CarSawari and HopWays app.

2.2.1 Carpooling System: Bla-Bla Car

It is designed for inter-city car sharing system using android by Frederic Mazzella at the year of 2006. It have four phases like registration carried with face book account, authentication with 2-D effects, location mapping held by person location entry [10] and payment is processed by online.

2.2.2 Carpooling System: CarSawari

It is designed to overcome issues in Bla-Bla car application and mainly aimed to deviate the plan from inter-city to intra city car sharing .It rectifies the pre-

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vious app with initiating registration modules carries the layout needed to login without social media account. Next modules uses 3 tier authentication facilities followed with adopting GPRS for land marking and cash payment services.

2.3 K-nearest neighbor algorithm

K-nearest neighbors (KNN) algorithm belongs to families of Machine Learning Techniques. It is used for both classification and regression that can be mapped to a supervised learning algorithm.

The algorithm K- number of nearest neighbor region basically states:

KNN ALGORITHM:

i. From the user get the K value
ii. Based on the K value , it give out the nearest neighbor region
iii. K nearest region is computed from the point where the user requested
iv. By comparing all the point give out the correct result.

K- Number of nearest neighbor region

3.EXISTING SYSTEM

Many proposed carpool service systems [6] can be divided into two broad categories based on their features. The first one is web-based that comprises systems to 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 never include Location Display of user (GIS) & not real-time. The next 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 Share Your [5] Ride platform by which users can readily submit carpool requests and offers via its map-based interface. In addition, Share Your Ride supplies a GIS-based routing service.

3.1 Drawbacks:

- 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 not been developed to decrease lessen traffic congestion.
- Many systems supply simple carpooling functions including the option to send requests for a specified date and time, and search for applicable users.

4.PROPOSED SYSTEM:

When person desire to know target place i.e. destination, information based on consumer's requirement, as an example, user needs to reach nearest ATM or hospital. He can get ATM or hospital information using internet service provider. However he wishes effective result with respect to travel time and fee (i.e. nearest route).

KNN-Route analysis [3]:

Convey the common man needs and relatively design application that supplies all of the expertise the roadman desires in convenient and efficient manner. This method also known as car-sharing because while one travel to their destination they can also share the vehicle with other willing passenger and so their expenses reduce from normal charges. These exploit the reduction in fuel costs, tolls and the stress of driving when sufficient number of people travels together in one vehicle. Carpooling applications nowadays become environment friendly app and assure to save our mother nature by gently adopting to use it.

It reduces traffic congestion and other toxic gases in the air. Along with these benefits, it saves much space in parking allotted room. During high fuel prices and high pollution periods, making use of the car pooling system is an intelligent decision. An car pooling application designed to allow passengers to collaborate with other willing people to plan out their journey using the user interface of the app after proper login in to it. It enables passengers to share expenses and not be anxious about reaching late while making new alternative connections. K-NN [7] Based Route Analysis mainly focus on Location-Based [2] Service/Server.

It provides mobile users with query services on a data set P, whose POIs (e.g., restaurants, cafes) are specific to the LBS's application. The LBS may store a road network G with edge weights as spatial distances, however G cannot provide live travel times. In case P and G do not fit in main memory, the LBS may store P as an R-tree and store the G as a disk-based adjacency list.

ADVANTAGES:

- Our proposed system incorporates mobile communications technology with Grid Mapping to create a carpool service which is operable in real time.
- Users can submit requests to the intelligent carpool system which automatically echo their current locations via the diverse technology driven palmtop, smart and handheld devices which have feature to focus on road side mapping capabilities.
- The system will use the carpool matching algorithm to generate and return match results within a short amount of time.
- Better time saving.

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- Improved cost saving both car owners and passengers.

4.1 WORKING PRINCIPLES:

4.1.1MULTIPLE PEER SIMULATION:

The multiple peer simulation modules concurrently model a predefined number of mobile hosts. It implements all the functionality of a single mobile host and provides the communication facilities among peers and from peers to remote spatial database servers.

4.1.2 SERVER MODULE

The server module is responsible for storing car booking users of interest indexed by an R-tree structure. It performs K-NN queries from peers with pruning bounds and records the I/O load and access frequency of the spatial database server.

4.1.3 ROUTE SAVER BASED NEAREST NEIGHBOUR QUERY VISUALIZATION MODULE

The route saver based nearest neighbor query visualization module render the result after verification of sharing-based K-NN query in a next proceeding step. Users can arbitrarily select a mobile host and launch a location-based K-NN query within the selected region. It provides mobile users with query services on a data set, whose POIs (e.g., restaurants, cafes) are specific to the LBS's application.

The LBS [4] may store a road network G with edge weights as spatial distances, however G cannot provide live travel times. In case P and G do not fit in main memory, the LBS may store P as an R-tree and store the G as a disk-based adjacency list.

4.1.4 ONLINE CAR USER ROUTE API MODULE

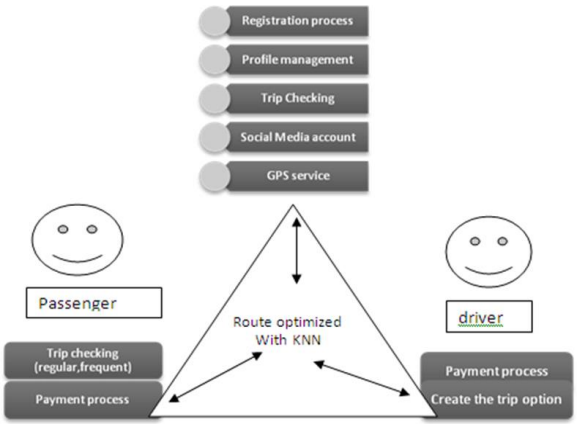

Figure 1 Carpooling system shareit

This module is to computes the shortest route between two car booking users on a road network, based on live traffic. It has the latest road network G with live travel time information of mobile user. Using a mobile device (smart phone), the user can acquire his current geo-location and then issue queries to a location-based server. In this module, we consider range and KNN queries based on live traffic.

Carpooling system shareit pictorial view shown in Figure. 1. It contains common responsibilities module along with passenger and driver module. In addition, last module that is very smart to express the routing decision taken by appropriate KNN algorithm

4.2 CAR POOLING ANALYSIS:

Short term: CPNS=CarPoolNotshare,
CPS=CarPoolshare,
RPC=registeredcount,
URPC=unregisteredcount,
Spc=Sheetpercar

Initialization:

Source=x;
Destination=y;
Spc=α;
Thresholdtrafficrestrict=β;

Procedure: Car Pooling shareit

```
For (time=opening; time<peek; t++) {

        V (t) =RPC/Spc;
        V1 (t) =RPC%Spc;

   If V1 (t)>1
        Carneed (t) =V(t)+1;

else
        Carneed (t)=V(t);
        CountofvehicleCPNS=URPC-family joining;
        CountofvehicleCPS=carneed (t);

//sharing car

   If (countofvehicleCPS-β)<0) No Traffic for this
   time;

else
         Traffic (rare) alert should be implemented;

//Not Sharing

   If (countofvehicleCPNS-β)<0 )
        No Traffic for this time;
else
      Traffic alert improper;
      ExcesstrafficCPNS%= countofvehicleCPNS-β/β
      ExcesstrafficCPS%= countofvehicleCPS-β/β

      }
```

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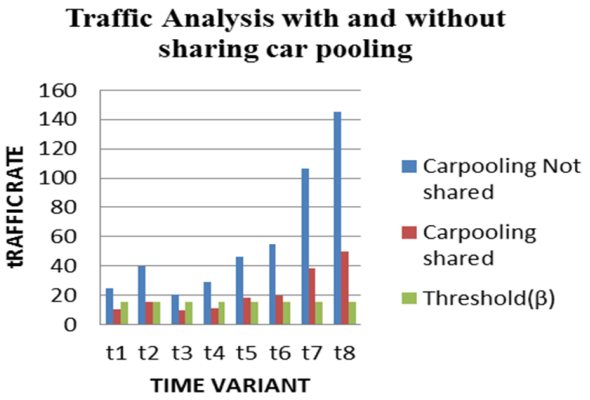

Figure 2 Traffic analysis of shareit

Percentage ratio between ExcesstrafficCPNS and ExcesstrafficCPS (Figure.2) varies at least 30 to 60. Sharing reduce the fuel, traffic controlled, protection taken care as it is registered, especially for girls.

5. CONCLUSION

Carpooling system is very effective means to reduce pollution and the congestion of vehicles in cities. It also provides an eco-friendly way to travel. It also provides an opportunity to meet new people. As today most people prefer private vehicle to travel due to delay caused in public transport system and luxuries provided by private vehicles. Pre-registration ensures security, as only identified people get into the vehicle so that trust can be established. The people registered in shareit system can be allotted specific days and time on which share the public vehicle, so that no inconvenience is caused to its registered passengers for daily commute. Thus the proposed carpooling system will be effective in reducing environment pollution.

We have considered the problem of Route Saver Query Processing Data by K-NN data retrieval on data horizontally distributed over a Mobile network. Centralizing all the data to a single machine to run a centralized Route Saver Query Processing Data by K-NN is not a feasible option. Thus, in this dissertation, an attempt was made to implement two approaches for approximate Route Saver Query Processing Data by K-NN data retrieval without centralizing the data. Neither of these requires network-wide synchronization and both can approximate the results of centralized data retrieval at reasonable communication cost.

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