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Avoiding Traffic Congestion Based on MHR tree in Carpool Services

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Abstract— Modern economic development has resulted in urban and industrial growth, leading to rapid increases in the number of vehicles on roadways and, thus, severe traffic congestion problems in large cities around the world. Carpooling is one of the most valuable solutions to traffic congestion. Carpooling is the sharing of car journeys so that more than one person travels in a car. In this paper, an advanced carpool system is described in detail and called the intelligent carpool system (ICS), which provides carpoolers the make use of the carpool services via a smart handheld device anywhere and at any time. It is critical to develop algorithmic methods for optimally matching drivers and passengers on the service agency of the ICS system. To give system users the opportunity to obtain carpool matches anywhere and at any time, drivers and passengers similar can use the MC module to perform carpool operations (e.g., requesting and offering rides) via their mobile devices. MHR tree, for efficiently answering approximate string match queries in large spatial databases.

Keywords- *Intelligent carpool service(ICS), Mobile Clients (MC)*

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I. INTRODUCTION

The main aim of carpooling is to provide an effective solution to a traffic congestion problem by allocate their vehicle with one or more drivers whose destinations are identical. It helps environment by decreasing the rate of vacant seats by increasing the rate of occupation. There are a small number of carpooling systems which are already present in the World but they are web based and simply have choice to send a request option for a specific date and time and give a exact result. Some of the carpool use the aspect of several systems feature a digital GIS mapping facility by which to provide a visual tool with exact location information to users. Unfortunately, these systems are neither efficient nor suitable for users who want real-time carpool matches and no security present. An intelligent carpool system which gives proper algorithm using MHR-Tree.Drivers and passengers can immediately access real time carpool service via the structure of ICS, with their current location and other necessary information input by their smart phone or other devices. The mobile computing module is used to perform carpool operations (e.g, requesting and offering rides) via their mobile devices.

II. RELATED WORKS

Smartphone technology enables dynamic ride-sharing systems that bring together people with similar journey and time schedules to share rides on short-notice. Increasing the number of travelers per vehicle trip by effective usage of empty car seats by ride-sharing may of course enhance the efficiency of private transportation, and contribute to reducing traffic congestion, fuel consumption, and pollution. Moreover, ride-sharing allows users to share car-related expenses such as fuel costs. The simulation results suggest that dynamic ride-sharing may represent a useful option to reduce system-wide vehicle miles, reduce trips and save travel costs, even when participation rates are relatively small [1]. A ride-share provider, either private or public, helps people to establish ride-shares on short-notice by automatically matching up drivers and riders. The objectives of the ride-share provider and ride-share users are aligned because both the total travel costs of the users and the external costs to society relate to the total system-wide vehicle-mile[2].

III. PROPOSED SYSTEM

This paper presents a novel index structure, MHR-tree, for professionally answering approximate string match query in large spatial database. The MHR-tree is based on the R-tree increased with the min-wise signature and the linear hashing technique. For a range query r, start from the root and check the MBR of each of its children, then recursively visit any node u whose minimum bounding rectangle (MBR) intersects or falls inside r. When a leaf node is reached, all the points that are inside r are return. R*-trees achieve better performance in general than the original R-trees. This is general view of MHR tree. MHR tree is created using whole dataset given for searching and arranged depending on their ranges. For searching it takes leaves keywords and then search within them (keywords). Here we are using hashing for searching the keywords. For each source passed same key and whenever we give any keyword query then flag values (number of times keywords find out) along with their key values get displayed. Introduces a new index for answering ESAS queries powerfully which embeds min-wise signatures of q-grams from sub trees into the R-tree nodes. The RSASSOL method separates the road network, adaptively search relevant sub graph, and prune candidate points using both the string identical index and the spatial reference nodes. By using the MHR-Tree is able to find the optimum carpool route and matching results both accurately and quickly in accordance with the optimization of all objectives[18]

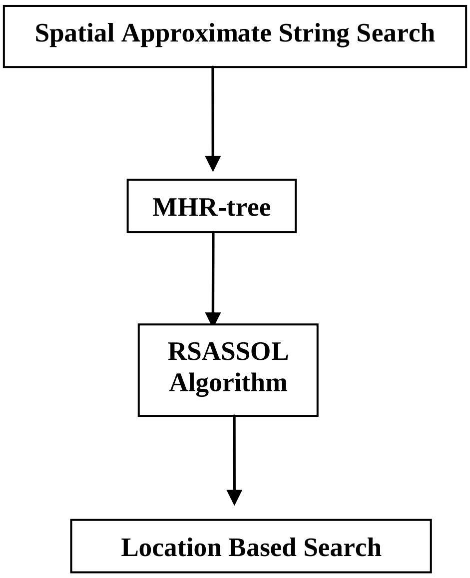

Fig 1. ARCHITECTURAL DIAGARM

A. RSASSOL ALGORITHM

The paper on spatial approximate string search presents a comprehensive study for spatial approximate string queries in road networks. We use the edit distance, cosine similarity as the similarity measurement for the string predicate and focus on the range queries as the spatial predicate. Given a query, the RSASSOL algorithm on road network returns the best objects with shortest path to the query location and textual relevance to the query keyword. [3]

B. LOCATION BASED SEARCH

The location based search is based on the distance between a user specified location and locations that are based on the maps available in the web. The passenger can give the latitude & longitude details that location also viewed by map. The location based search consists of Information Platform it has Information Retrieval, Information Matching, Mutual Selection.

C. INFORMATION RETRIEVAL

Drivers contact the information platform, release carpooling information such as vehicle running time and routes, and query the passenger details. Passengers login the system, submit carpooling applications, namely journey time, location, and route information, and verify the driver information.

D. INFORMATION MATCHING

The information system summarize drivers' time, routes information, and passengers' carpooling require information and match them reasonably. Then the matching result will be feed back to both sides in time so as to complete the next step.

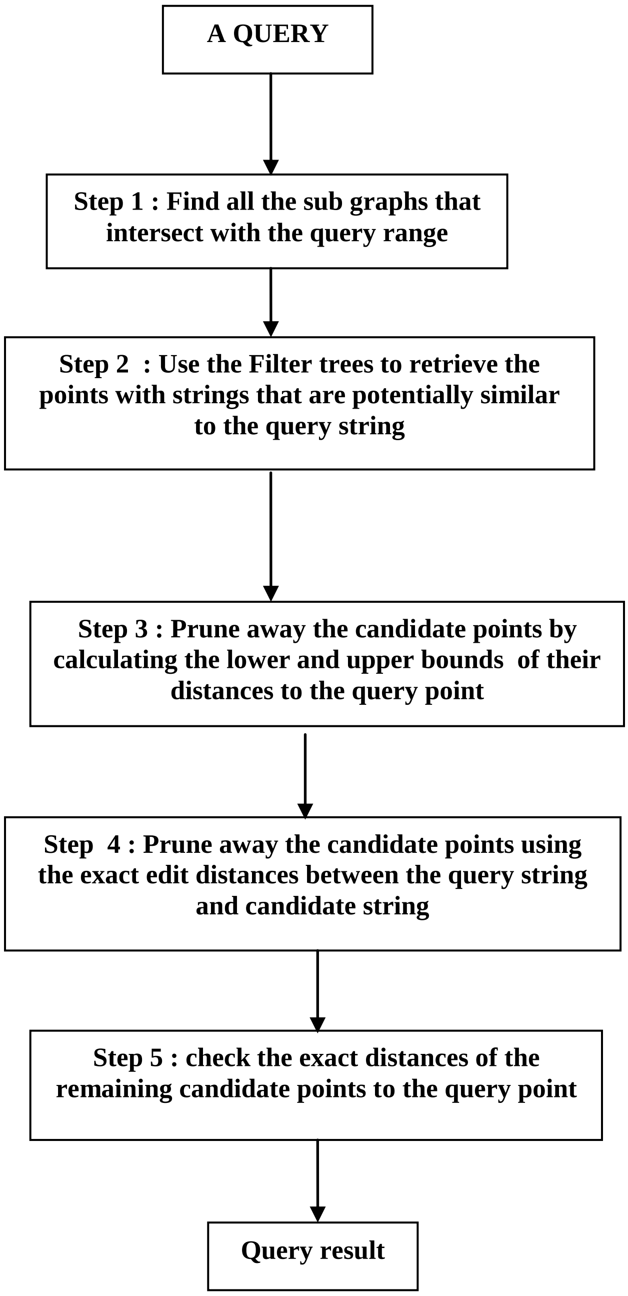

FIG 2.RSASSOL ALGORITHM

E. MUTUAL SELECTION

Drivers (passengers) choose passengers (drivers) according to their own requirements and the initial matching details; if they select each other, then the matching will be successful. Otherwise, the system will maintain matching details. The carpooling information will be processed by the platform once released by both sides. The system will send the matching details to drivers and passengers for mutual selection. Passengers judge the driver's driving skill and the vehicle condition. Drivers check the number of passengers, the working place, and time. If fulfilling mutual selection cannot be reach, the system will match information again until both sides are satisfy with the matching results so as to understand the humanized carpooling and improve the carpooling efficiency.

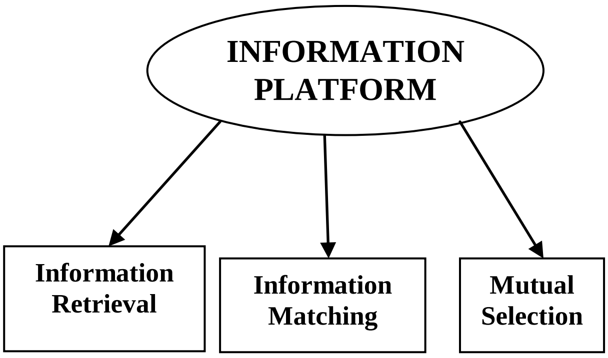

FIG 3.LOCATION BASED SEARCH

F. MC Module

The MC module is a mobile application built on sophisticated mobile operating system such as ios, Android, Windows Phone, and so on. It features an included GPS receiver and capability for mobile communication. Because of this, users can obtain information about their present locations by automatically accessing the GPS signals of satellites and can also retrieve geo resource map images over the Web Map Service (WMS) application programming interface (API) to precisely pinpoint their pickup and destination location. Using the MC module, users can both offer carpool rides as drivers and send carpool requests as passenger. When drivers and passenger are in the same regional range, a group of users' offers and requests will help them find proper carpool partners[17].

IV. METHODOLOGY

A. The query algorithm for the MHR-tree

The query algorithms for the MHR-tree generally follow the same principles as the related algorithms for the spatial query component. However, we would like to incorporate the pruning method based on q-grams and set resemblance estimation without the explicit knowledge of Gu for a given R-tree node u. We need to achieve this with the help of s(Gu). Thus, the key issue boils down to estimating |Gu ∩ Gσ| using s(Gu) and σ. The details of estimating |Gu ∩ Gσ| is demonstrated in Section in [4].The SAS range query algorithm is presented in. One can also modify the KNN algorithm for the normal R-tree to derive the KNN-MHR algorithm. The basic idea is to use a priority queue that commands objects in the queue with respect to the query point using the MinDist metric. However, only nodes or data point that can pass the string pruning test will be inserted into the queue. Whenever a point is detached from the head of the queue, it is inserted in A. The search terminates when A has k points or the priority queue becomes empty[16].

Range- MHR(MHR-tree R, Range r, String σ, int τ)

1. Let B be a FIFO queue initialized to ∅, let A = ∅;
2. Let u be the root node of R; insert u into B;
3. while (B 6= ∅)
4. Let u be the head element of B; pop out u;
5. if (u is a leaf node)
6. for (every point p ∈ up)
7. if (p is contained in r)
8. if (|Gp ∩ Gσ| ≥ max(|σp|, |σ|) − 1 − (τ − 1) ∗ q)
9. if (ε(σp, σ) < τ) Insert p in A;
10. else
11. for (every child entry ci of u)
12. if (r and MBR($_{wi)}$ intersect)
13. Calculate s(G = G_{wi} ∪ Gσ) based on s(G_{wi}), s(Gσ) and Equation 4.1;
14. Calculate |G_{wi} ∩ Gσ| using Equation 8 in [37];
15. if (|G_{wi} ∩ Gσ| ≥ |σ| − 1 − (τ − 1) ∗ q)
16. Read node $_{wi}$ and insert $_{wi}$ into B;

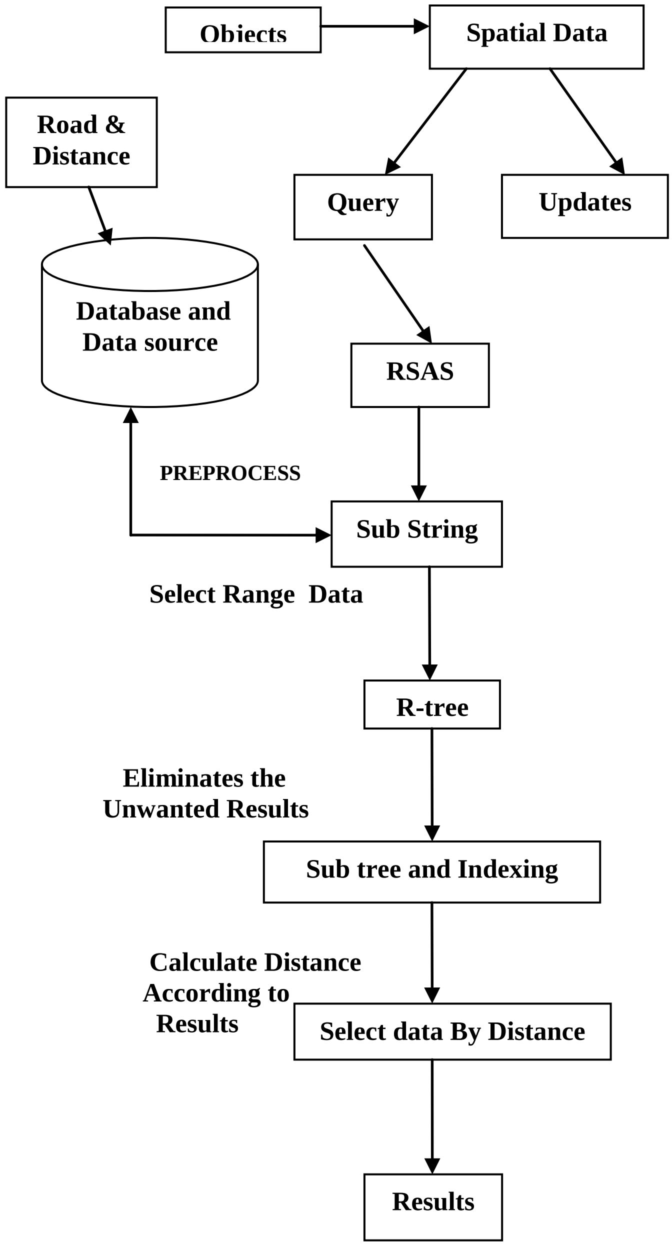

FIG 4.WORK FLOW DIAGRAM

V. CONCLUSION

In this paper carpooling Services based on fixed time and routes. The MC module enables the drivers and the passengers to respectively send their carpooling requests via a mobile application on their mobile devices. MHR-Tree is to control an adaptive algorithm that discover reasonable partitions of nodes from R-tree-based index based on spatial as well as string information in R-tree nodes. To support well-organized approximate string search on a gathering of strings, which is employed as a module in query algorithm**.** The drivers and passengers also have the option of rating each other after their ride is over to share their experiences with each other and such ratings can also viewed by future potential carpooling partners.

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