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A Novel Method to Estimate the Route and Travel Time with the Help of Location Based Services

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Abstract

Location-based services (LBS) allow mobile users to query the points-of-interest (e.g., restaurants, cafes) on various features (e.g., price, quality, and variety). Additionally users require accurate query results with up-to-date travel times. Lacking the monitoring infrastructure for road traffic, the LBS may obtain live travel times of routes from online route APIs in order to provide accurate results. Our aim is to reduce the number of requests issued by the LBS significantly while preserving accurate query results. Initially, we suggest exploiting recent routes requested from route APIs to answer queries accurately. Then, we design successful lower/upper bounding techniques and ordering techniques to process queries conveniently. Also, we study parallel route requests to further reduce the query response time. Our experimental evaluation shows that our solution is three times more successful than a competitor, and still achieves high result accuracy

Keywords- ***Time Dependent Service Graph; Spatial Data Mining; LBS, Elapsed Time***

I. INTRODUCTION

Wireless network is one of the significant technologies in this up growing world. It is one of the important factors for the roaming users during their travel across the networks. In today's World, Smartphone becomes widely used device. Location of user or an object is its geographical position on the earth and such location data is traceable and real time. This information can be categorized as per longitude, latitude and street address used on the geographical domain. With the enhancement of mobile technology people are often required accurate and efficient query processing in mobile networks. Users of mobile devices tend to often have a need to find nearby points of interest from a Location Based Application (LBA) provides Location Based Services (LBS) by using queries called Location Based Queries(LBQ). The resultant of these queries is based on location of mobile user. LBS are one of the fastest growing areas of computing. There is rapid demand to accurately and quickly find the location of a mobile at low cost. Location-based applications are becoming popular and available and provide the user with information based on their location. Location Based Service (LBS) providers such as Google, Yahoo! and Microsoft, are accessed by the company's own mobile client applications. Shortest path computation is a significant function in modern car navigation systems. They always were growing popularity of online map applications and their wide deployment in mobile devices and car navigation systems, increase number of client search for point to point fastest paths and the corresponding travel times. On static road networks where edge costs are constant, this problem has been largely studied and many efficient speedup techniques have been developed to compute the fastest path in a matter of milliseconds. For many users, this constitutes an unacceptable violation of privacy, and efforts should be made to avoid it. As location technology becomes common place, users will become increasingly aware of and concerned about location privacy. Not only are privacy and personal safety important considerations, but recent advances in mobile advertising have even opened the possibility of location-based spam. The LBS server must not learn the user's exact location. It may only analyze a general region that is huge enough;

in terms of area and the number of POIs it contains, to confer a sufficient level of privacy to the user's satisfaction. There must be no third parties, trusted or otherwise, in the protocol between the user and the server. The implementation must be computationally successful on hardware, such as smart phones, which are resource constrained. A user may be expected to permit a delay of no more than several seconds for any kind of query. Some existing works focus on retrieving individual objects by specifying a query consisting of a query location and a set of query keywords. These system define and categorize indoor distance between indoor uncertain objects and derive different distance bounds that can facilitate the join processing and better decision making which is also based on the shortest route. Indexing on road networks have been extensively studied in the existing. Various shortest path indices have been developed to support shortest path search only. After analyzing some existing system, all system only concentrated on the routes and traffic flow. But our proposed system gives better search like nearest services. The proposed system is used to find the nearest neighbour query and service. Based on the location and preference of the user the query answering can made. The proposed system develops a new rapid data access method called traffic based service selection. That is used to extend the road way in multidimensional method with the best algorithm. For example hotel details (food, price, room availability), theatre (name of the films, ticket availability, etc.), etc

II. EXISTING WORK

The existing works focus on retrieving individual objects by specifying a query consisting of a query location and a set of query keywords. Each retrieved object is associated with keywords relevant to the query keywords and is close to the query location. Various shortest path indices have been developed to support shortest path search efficiently. Some existing system studies how to process range queries and KNN queries over points-of-interest, with respect to shortest path distances on a road network. The evaluation of range queries and KNN queries can be further accelerated by specialized indices. Two other relevant studies concentrates on ranking queries that combine both the spatial and text relevance to the query object. Several techniques have been proposed for identifying candidate strings within a small edit distance from a query string.

III. LITERATURE SURVEY

Jinfeng Ni and C.V. Ravisankar proposed a PA-Tree: A Parametric Indexing Scheme for Spatio-temporal Trajectories, 2005 [1]. It propose many new applications involving moving objects require the collection and querying of trajectory data, so efficient indexing methods are needed to support complex spatio-temporal queries on such data. Current work in this domain has used MBRs to approximate trajectories, which fail to capture some basic properties of trajectories, including smoothness and lack of internal area. Juyoung Kang and Hwan – Seung Yong proposed a Mining Spatio-Temporal Patterns in Trajectory Data December 2010. It proposes spatio-temporal patterns extracted from historical trajectories of moving objects reveal important knowledge about movement behavior for high quality BS services. Existing approaches transform trajectories into sequences of location symbols and derive frequent subsequences by applying conventional sequential pattern mining algorithms. However, spatio-temporal correlations may be lost due to the inappropriate approximations of spatial and temporal properties. They address the problem of mining spatiotemporal patterns from trajectory data. The temporal information will decrease the mining efficiency and the interpretability of the patterns [2]. Mohammad Kolahdouzan and Cyrus Shahabi proposed a Voronoi-Based K Nearest Neighbor Search for Spatial Network Databases. It Proposes A frequent type of query in spatial networks (e.g., road networks) is to the K nearest neighbors (KNN) of a given query object. Object distances depend on their network connectivity 149 Int. J. Engg. Res. & Sci. & Tech. 2015 R Larajenifer et al., 2015 this article can be downloaded from 2015.php#1 and it is computationally expensive to compute the distances between objects. This

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approach is based on partitioning a large network to small Voronoi regions, and then pre-computing distances both within and across the regions. By localizing the pre computation within the regions save on both storage and computation and by performing across-the-network computation for only the border points of the neighboring regions, distance computation by up to one order of magnitude [3]. Swarup, Vishanath and Sridhar proposed a Selectivity Estimation in Spatial Databases. Selectivity estimation is a critical component of query processing in databases. Despite the increasing popularity of spatial databases, there has been very little work in providing accurate and efficient techniques for spatial selectivity estimation. Spatial data differs so significantly from relational data that relational techniques simply do not perform well in this domain [4]. Sattam, Alexander and Chen Li proposed a Supporting Location-Based Approximate Keyword Queries. It proposes an index structure called LBAK tree to answer locationbased approximate-keyword queries. We showed how to combine approximate indexes eminently with a tree-based spatial index. We developed a cost based algorithm that selects tree nodes to store approximate indexes. Moreover, we improved the techniques to exploit the frequency distribution of keywords, further reducing the index size and query times. Finally, we conducted extensive experiments to show the eminency of our techniques [5]. In a fore mentioned works various issues are there such as poor pruning when such indices are using parametric space indexing for historical trajectory data, decrease the mining efficiency and the interpretability of the patterns, computationally expensive to compute the distances between objects, relational techniques simply do not perform well in this domain [6]. According to above issues, the existing system is very difficult to give efficient results and have performance issues. We propose effective search with performing well in domain, get accurate results and decrease the requests from users by using the meaningful spatio - temporal region search, to propose new techniques for spatial selectivity estimation and conducting the extensive experiments [7].

IV. PROPOSED SYSTEM

The proposed system performs the click point based location access system, which eliminates the necessity of GPS in computer devices. The system gets the latitude and longitude of the location and find the nearest neighbor query and service. Based on the location and preference of the user the query answering is made. This work deals with the rapid nearest string search in large spatial databases [8]. Especially this investigates the spatial associated queries improved with a string similarity and geographically nearest search predicate in both Euclidean space and road networks. The proposed system develops a new rapid data access method called traffic based service selection that extends the conventional inverted index to cope with multidimensional data, and comes with enhanced and best algorithms that can answer nearest neighbor queries with keywords in real time along with the summarized data.

A. System Model

Following diagram is the system architecture of our proposed system. It is mainly explaining about various databases in it.

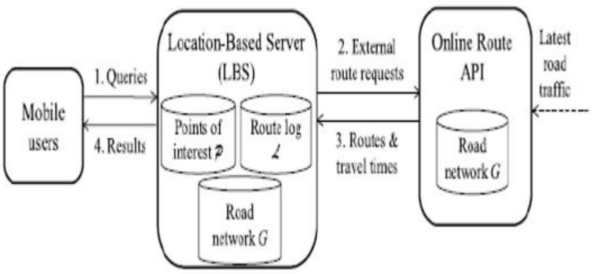

Figure 1. System Architecture

Our System Flow Diagram explains the process of the proposed system. User gives the requests based on the spatial. It search based on the two main terms such as query and location points. The Location point connected with location based service (LBS). LBS stores the data source service details and location validating by route guide algorithm. It can retrieve data based on user query from LBS using Location Point Based Tree with inverted index [9]. Finally, it will give

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the results to the client as the availability of services, paths with traffic, nearest services and other details

B. Query processing

Algorithm 1:

Location Point based Tree (LPT with Inverted Index): The location point tree saves the location points along with the service details. The service identifies the service by using the spatial POI which will be stored on the LPT_II. To speed up itinerary process in this indexes all the objects' subspace spatial scopes by an LPT tree where the subspace spatial scopes are stored in the leaf nodes as data entries. Additionally, to support service recommendation, this follows mapping module and KNN search [10]. In the diagram p1, p2, p3, p4, p5…p7 are the service points. In the proposed system every service point will be stored with an

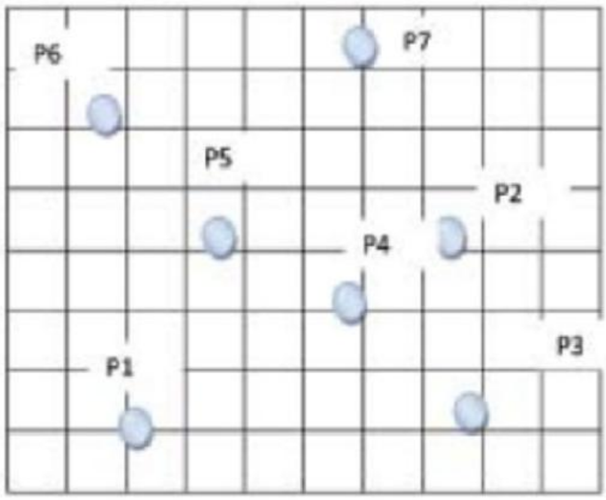

Figure 2. Points of Interest

Algorithm 2:

LPT_II maintenance tree Steps The following table represents the location point and available service details in the location. The service can able provide appropriate services for the user interest based on the location point based service list. This helps in two ways. One is the retrieval time has reduced. And the next is fast search in the LPT helps to avoid the unavailable services [11].

POI	Services (S)
P1	S1,S3
P2	S4,S6
P3	S5,S4
P4	S4,S7
P5	S2,S8

Figure 3. LPT II maintenance tree Steps

1. Initial location source with respect point p1,p2..pn 2. For every point in the source P do a. Initialize service S1…Sn for respective points. b. Set service and code for every service 3. Get rank for each service and store into the ascending order. 4. Store the node in the top level based on the rank 5. Prune the other items from the LPT.

V. CONCLUSION

Using the LocationPoint Based Tree (LPT) algorithm, the retrieval time has reduced. In this algorithm, structure can be maintained in the form of tree called as maintenance tree. This tree gives the fast search and avoids the unavailable of services. In this approach it is adapted to the user's convenience because comparing to the existing system, it return the solution and also it return another solution if nearest services is not available or if it have any issues.

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