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A Survey on Location Based Service

E.Anitha[1], Dr.M.Sornamageswari[2]

M.Phil Scholar, Dept of Computer Science, Government Arts College (Autonomous), Coimbatore[1]

Asst Professor, PG & Research Dept of Computer Science, Government Arts College (Autonomous), Coimbatore[2]

Abstract: Mobile technology is one of the fast growing technologies to improve the communication among the people. With the tremendous growth in mobile technology, people of the mobile user want to know the information regarding their needs which is based LBS (Location Based Service). LBS enable mobile users to query points-of-interest (e.g., ATM, restaurants) on various features (e.g., category, price, quality, and variety). They manage points-of-interest (POIs) specific to their applications, and enable mobile users to query for POIs that match with their preferences and time constraints and also it secures a user identity and locality within basic mobile communication services. For this approach this paper provides the survey about various techniques for providing the accurate and efficient query for the mobile users.

Keywords: Wireless Network, Mobile technology, LBS, Accurate and Efficient Query ~~Processing.~~

I. INTRODUCTION

Wireless network is one of the important ~~technology~~technologies -in this up growing world. It is one of the important factors for the roaming users while they travel across the networks. In today's World, Smartphone becomes widely used device. Location of user or object is its geographical position on the earth and such location data is traceable and real time. This information can be classified as per longitude, latitude and street address used on the geographical domain. With the improvement of mobile technology people are often required accurate and efficient query processing in mobile networks. Users of mobile devices tend to frequently have a need to find nearby points of interest from a Location Based Application (LBA) provide Location Based Services (LBS) by using queries called Location Based Queries(LBQ). The result of these queries is based on location of mobile user. LBS are one of the fastest growing areas of computing [1]. There is an escalating demand to accurately and quickly determine the location of a mobile at low cost. Location-based applications are flattering 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 an important function in modern car navigation systems [2]. 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 extensively 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 commonplace, users will become increasingly aware of and concerned about location privacy [3]. 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 identify a general region that is large 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 efficient on hardware, such as ~~smartphones~~smart phones, which are resource constrained. A user may be expected to tolerate a delay of no more than several seconds for any kind of query [4, 5]. For this approach this survey shows various authors' approaches and their technique~~s.~~

II. LITERATURE REVIEW

Nowadays mobile technology and wireless network are interconnected together. Wireless transaction are done through Public atmosphere so the user can get the information easily at the same time they were face many issues, this section of this survey shows various author approaches and their discussion.

Yan Sun, Thomas F. La Porta and Parviz Kermani proposed a Location-Based Services System (LBSs) for location sharing in social networks. LBS system is used to secure the privacy of the user locations. It secures a user identity and locality within basic mobile communication services. This paper focuses on following aspects: User should be control the access to location information at different levels of granularity and with different levels of user control, user has to describe the cluster of entity that are allowed to access its location information and the main goal of location information is to provide intelligent services to the other users and servers. LBS support location privacy control by the user. It supports user control and scalability. It provides Instant Messaging service for server and clients [6].

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Chunlin Jiang , Weijia Jia and Ke Gu proposed a anonymous authentication protocol based on anonymous proxy signature for wireless communication systems. With the rising number of wireless network with numerous users requires anonymous authentication while roaming among different areas in different networks. Roaming user does not like to identify and tracker their own information to other user, they also want to secure their information while roaming from home network to foreign network [7].

Monitoring personal location under un trusted server may cause the privacy problem for the user in wireless sensor network. For this issue Chi-Yin Chow, Mohamed F. Mokbel, and Tian propose a preserving-privacy location monitoring system to provide better security to the user. Chi-Yin Chow et al propose a two in-network algorithm, which are resource and quality-aware algorithms used to protect the location information of the user [8]. Both these algorithms are well established in k-anonymity privacy model to indistinguishable among k person's aggregate locations. Each aggregate location is a cloaked area. This method presents a high quality for monitoring services for the locations of system user. Hence this approach provides a high quality location monitoring. The resource-aware algorithm is one which is used to reduce communication and computational cost, while the quality-aware algorithm is used to reduce the size of cloaked areas in order to generate more accurate aggregate locations. Here they use spatial Histogram model to analyze the aggregate locations from sensor node to estimate the monitored objects. Hence this approach reduces the quality of monitoring services; it requires high quality services for larger areas and less privacy protection.

Jeppe Rishede et al study the importance of the Web search is ubiquitous in our daily lives. Caching has been broadly used to diminish the computation time of the search engine and reduce the network traffic beyond a proxy server. An additional form of web search, known as online shortest path search, is trendy due to progress in geo-positioning. Nevertheless, existing caching approaches are unsuccessful for shortest path queries. This is because of numerous crucial differences between web search results and shortest path results, in familiar to query matching, cache point overlapping, and query cost difference. Motivated by this, they identify several properties that are essential to the success of effective caching for shortest path search. Our cache exploits the optimal sub path property, which allows a cached shortest path to answer any query with source and designation nodes on the path. They exploit statistics from query logs to approximation the advantage of caching a specific shortest path, and they employ a greedy algorithm for placing beneficial paths in the cache. Also, they propose a compressed cache structure that ropes efficient query corresponding at runtime. Empirical results on real datasets confirm the effectiveness of our proposed techniques [9].

Femi Olumofin et al analyze the Mobile smartphone users frequently need to search for nearby points of interest from a location based service, but in a way that conserves the privacy of the users' locations. We present a technique for private information retrieval that allows a user to repossess data from a database server without informative what is in reality being repossessed from the server. They perform the retrieval operation in a computationally efficient manner to make it practical for resource-constrained hardware such as smart phones, which have limited processing power, memory, and wireless bandwidth. In scrupulous, our algorithm makes use of a variable-sized cloaking section that increases the location privacy of the user at the cost of additional totaling, but maintains the same traffic cost. Our proposal does not necessitate the use of a trusted third-party component, and guarantee that they find a good compromise between user privacy and computational efficiency. They estimate our approach with a proof-of-concept accomplishment over a commercial-grade database of points of interest. We also calculated the presentation of our query technique on a smartphone and wireless network [10].

R Larajenifer et al studied The GPS-equipped vehicles can be observed as mobile sensors probing traffic flows on road surfaces and users are usually experienced in finding the fastest (quickest) route to a target based on query from the chronological GPS trajectories of a large number of vehicles, and provide a user with the practically longest route to a given destination at a given departure time. This also provides the elapsed time to reach the destination. Service assimilation process helps to retrieve all service details from the server without questioning query. In the proposed approach, this proposes a time-dependent service graph, where a node is a road segment recurrently traversed by other users, to model the intelligence search of LBS and the properties of dynamic road networks. It is used to find the nearest neighbor services. We build the system based on a real world spatial simulation dataset and stored in MOD (moving object database) [11].

Haibo Hu et al, Nearest neighbor (NN) queries have been extended from Euclidean spaces to road networks. Existing techniques are either based on Dijkstra-like network expansion or NN/distance pre-computation. The former may cause an explosive number of node accesses for sparse datasets because all nodes closer than the NN to the query must be visited.

The concluding, e.g., the Voronoi Network Nearest Neighbor (VN3) approach, can handle sparse datasets but is inappropriate for medium and dense datasets due to its high pre-computation and storage overhead. In this paper, they propose a new approach that indexes the network topology based on a novel network reduction technique. It simplifies the network by replacing the graph topology with a set of interconnected tree-based structures called SPIE's. An nd index is developed for each SPIE and our new (k)NN search algorithms on an SPIE follow a predetermined tree path to avoid costly network development. By mathematical examination and investigational results, our new approach is shown to be efficient and robust for various network topologies and data distributions [12].

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III. ACCURATE AND EFFICIENT QUERY PROCESSING

a. Hierarchical Routing Algorithm

This algorithm is used for an efficient routing algorithm which absorbing two possible situation, i.e., within-community routing (WICR) and between-community routing (BCR), depending on whether the source and destination nodes belong to the same community or not. These algorithms were proposed to perform some pre-computation on the input data to reduce the search complexity. This hierarchies approach is based on its inherent hierarchical topologies (e.g., road categories, road lengths, and speed limits) [13]. This hierarchical community algorithm is applied in road networks; and here the authors developed a community-based hierarchical graph model that supports efficient path computation on large road networks. Then also a new hierarchical routing algorithm that can significantly reduce the search space over the conventional algorithms with acceptable loss of accuracy. Based on the identified communities, a hierarchical graph model is developed for structuring the road networks, and a heuristic hierarchical routing algorithm is then used to reduce search and provide near-optimal solutions.

b. Predictive Tree

Predictive queries on moving objects offer an important category of location-aware services based on the objects' expected future locations. This is used to predictive queries against moving objects on road networks. This approach provides a generic infrastructure for answering the common types of predictive queries including predictive point, range, KNN, and aggregate queries, updates the probabilistic prediction of the object's future locations dynamically and incrementally as the object moves around on the road network. It offer a fundamental type of location-based services based on users' future locations [14]. Common types of predictive spatial queries include predictive range query, e.g., "find all hotels that are located within two miles from a user's anticipated location after 30 minutes", predictive KNN query, e.g., "find the three taxis that are closest to a user's location within the next 10 minutes", and predictive aggregate query, e.g., "find the number of cars expected to be around the stadium during the next 20 minutes. In fact, Predictive queries are beneficial in various types of real applications such as (1) traffic management, to predict areas with high traffic in the next half hour, so appropriate decisions are taken before congestion appears, (2) location aware advertising, to distribute coupons and sales promotions to customers more likely to show up around a certain store during the sale time in the next hour, (3) routing services, to take into consideration the predicted traffic on each road segment to find the shortest path of a user's trip starting after 15 minutes from the present time, (4) ride sharing systems, to match the drivers that will pass by a rider's location within few minutes, and (5) store finders, to recommend the closest restaurants to a user's predicted destination in 15 minutes. The predictive tree prunes the space around each moving object in order to reduce computation, and increase system efficiency.

c. kNN Queries for Moving Objects on Road Networks

kNN search is radically different from single-pair shortest path solution. Though kNN search involves shortest path computation, the key point of kNN search is to quickly find those promising top-k objects rather than to calculate the shortest path from the query location to all candidate objects then ranks them. Therefore, it is not feasible to apply them to handle the kNN search on road networks effectively [15]. There are quite a number of studies on kNN queries for moving objects monitoring. These works studied the problem of finding nearest moving objects (e.g., taxies) to a location and focused on dealing with frequent updates of moving objects. In our case, they emphasize on the efficiency of the kNN queries on the static objects (e.g., gas stations), of which the ideas and implementations are totally different. The kNN search consists of two parts. The first one is the local Dijkstra search within MinDist-Inside-Leaf. The time complexity is $O(\tau \log \tau)$. The second one is MinDist-Outside-Leaf.

d. Road hierarchy-based partitioning

This method is the natural hierarchy present in road networks to panel the network into semantically meaningful areas. We construct high level areas by dividing the graph using the largest possible roads: Each area at this level is enclosed by large highways and will probably contain a large number of nodes and edges. We recursively subdivide areas by progressively decreasing the road-scale [16]. An efficient algorithm is developed that automatically partitions an arbitrary road network and constructs a natural hierarchy of areas. These areas are essential to the algorithm as they will be used to guide the driving pattern mining and adaptive fastest path pre-computation.

IV. OUTCOME OF THE SURVEY

- In this survey we have studied the accuracy and efficient data accessing issues in wireless mobile technology and analyze the problem of various research articles.
- Wireless communications is one of the up-growing technologies to provide better communication among people.
- Most of the researchers concentrate only on data transmission but failed to concentrate on user accuracy.
- They were accuracy problem while providing the data through the networks.
- Most wireless transactions are done through public atmosphere so they were occurred accuracy problem.
- They were problem under accuracy because of high computational and communication costs.
- LBS support location privacy control by the user. It supports user control and scalability.

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- It provides Instant Messaging service for server and clients

V. CONCLUSION

In this survey, we have presented an overview of accurate and efficient query processing in mobile networks. With the advancement of mobile technologies, wireless networks have become widely available and interconnected together. While at the same time provide a accurate and needed result will helpful for the mobile user through LBS system is most vital one. In this survey we have studied the competence of various approaches and presented the summary about LBS techniques. This shows the need of efficient query processing in LBS domain. With the limited information through LBS is not a satisfactory thing, to progress the satisfaction here we provide many approach of their merits and demerits provided in this article.

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BIOGRAPHIES

E.Anitha received her MCA from PKR Arts College for Women, Gobichettipalayam, Tamilnadu, India in 2010 and doing her M.Phil Degree in Department of Computer Science, Government Arts College, Coimbatore, Tamil Nadu, India in 2013.Her area of interest Includes Data Mining.

R.M.Sornamageswari received her M CA from Avinashilingam University, Coimbatore in 1996 And the M.Phil from monomania Sundaranar University in 2003 and the Ph.D. in Computer Science from Avinashilingam University, Coimbatore In 2011. She is working as Assistant Professor in Department of Computer Science, Government Arts College (Autonomous), Coimbatore. Her research Interest includes Image processing, Network Security.