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A NOVEL SECURE LOCATION BASED SKYLINE QUERY PROCESSING

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ABSTRACT

Location based services are having tremendous growth now a days due to smart phones and tablet devices. To improve the performance of the services several data management concepts have been proposed. Data management such as data outsourcing on the cloud and cloud service providers based data management are very popular. Here the cloud service providers are used to provide query services to the clients on behalf of the data owners. When there is process of data outsourcing and accessing by the cloud service provider may affect the security. And due to incorrect or incomplete query results to the clients may degrade the performance. So authorizing clients to authenticate query results is essential for outsourced databases. The proposed work overcomes the authentication problem for location based skyline process. The paper enhances the existing merkle skyline R tree method for dynamic objects in the road network. The proposed system also applies the spatial pre-obtain based approach which enables the clients to compute the new results during their mobility. The system performs the nearest neighbor method for fast data computation.

KEYWORDS: Data Mining, Location Based Services, Skyline Query

INTRODUCTION

In real world maximum no of transactions done through mobile devices, tablet computers and smart phones are playing major role in transaction, in existing works this process talking long time and also unsecured, for this issue past works are made through the Location based services(LBSs), using LBS scheme user carry the location awareness based data sharing, Among the many types of location-based queries, one important class is location-based skyline queries,These queries take into account both the spatial and non-spatial attributes of the Points Of Interests

Existing work on skyline query processing mainly consider the case of one query reference point only, While no previous work has been reported in the literature about multi-source skyline queries in road networks, some effort for simpler versions of this problem exist. The problem of multi-source nearest neighbor query processing, known as aggregate nearest neighbor query processing Most of the existing works fully depending on the Query service process only, authentication is a big challenging task in CSP, The proposed work consider the authentication process also, Location Based Services are given the awareness about the query transactions.The data owner analyzes, through a certificate authority, a pair of private and public keys of digital signatures in data sharing. Before delegating a spatial dataset to the CSP, the owner of the data builds an authenticated data structure (ADS) of the dataset. To support efficient query processing, the ADS is often a tree-like index structure, where the root is signed by the data owner using their private key. The CSP keeps the spatial dataset, as well as the ADS and its root signature. Upon receiving a query from the client, the CSP returns the query results, the root signature, and a verification object (VO), which is constructed based on the ADS. The client can authenticate the correctness of the query results using the returned VO, the root signature, and the data owner's public key.

LITERATURE REVIEW

Most works on skyline queries [1] so far have assumed a centralized data storage, and been focused on providing efficient skyline computation algorithms on a sole database. This assumption, however, fails to reflect the distributed computing environments consisting of different computers, which are located at geographically scattered sites and connected via Internet.

In this work [2] the paper intended to efficiently process constrained skyline queries [2] in such widely distributed environments. A constrained skyline query

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is attached with constraints on specific dimensions. A constraint on a dimension is a range specifying the user's interest.

Borzonyi et al. [3] introduced the skyline operator into database systems with algorithms Block Nested Loop (BNL) and Divide-and-Conquer (D&C). Chomicki et al. [4] proposed a Sort-Filter-Skyline (SFS) algorithm as a variant of BNL. Tan et al. [5] proposed two progressive algorithms: Bitmap and Index. The former represents points in bit vectors and employs bitwise operations, while the latter utilizes data transformation and Bþ-tree indexing. Kossmann et al. [6] proposed a Nearest Neighbor (NN) method. It identifies skyline points by recursively invoking R_-tree-based depth first NN search over different data portions. And proposed a Branch-and-Bound Skyline (BBS) method based on the best-first nearest neighbor algorithm. Godfrey et al. [7] provided a comprehensive analysis of previous skyline algorithms without indexing supports.

In earlier work most of the existing techniques fully concentrate the query processing approach only, in existing work presented a novel approach for reducing the spatial query access latency by leveraging results from nearby peers in wireless broadcast environments. Significantly, the scheme allows a mobile client to locally verify whether candidate objects received from peers are indeed part of its own spatial query result set. By virtue of its peer-to-peer architecture, the method exhibits great scalability: the higher the mobile peer density, the more queries can be answered by peers. Therefore, the query access latency can be markedly decreased with the increase of clients. Another method Distance -based skyline query as an extension to point- and line-based skyline queries. Index-based (I-SKY) and non-index resolve the range-based skyline problem, To handle the movement of the objects being queried, the incremental construction of the I-SKY index has also been formed. Distance-based skyline problem to reduce both the result set size and computation cost.

Distance-based skyline query to the continuous domain, and developed query processing algorithms for static and moving objects. This method provides a solution in terms of both the CPU time and I/O cost, In another work , three novel algorithms have been proposed for processing multi-source relative skyline queries in road networks. It is not only the first effort to process relative skyline queries in road networks, but also the first study on skyline queries by considering relative network distances to multiple query points at the same time. LBC is proven to be instance optimal in terms of the network search space over all algorithms where network distances are computed by expanding the searching region from query points without using pre-computed distance information.

Another important task in query processing is monitoring, generic framework for monitoring continuous spatial queries over moving objects. The framework distinguishes itself from existing work by being the first to address the location update issue and to provide a common interface for monitoring mixed types of queries. Based on the notion of safe region, the location updates are query aware and thus the wireless communication and query reevaluation costs are significantly reduced. They provide detailed algorithms for query evaluation/reevaluation and safe region computation in this framework. Enhancements are also proposed to take advantage of two practical mobility assumptions: maximum speed and steady movement. To evaluate the performance, they thoroughly conduct a series of experiments and compare the proposed framework with the optimal monitoring and the traditional periodic monitoring schemes. The results show that i) the framework substantially outperforms the periodic monitoring in terms of monitoring accuracy and CPU time while achieves a close to optimal communication cost; ii) the framework scales well to the number of monitoring queries and moving objects; iii) the framework is robust to various affecting factors including moving speed, constant movement period, and grid partitioning; iv) if the mobility assumptions hold, the enhancements can reduce the wireless communication cost by up to 40%. This paper demonstrates the feasibility and performance advantages of the framework. As for future work, they plan to incorporate other types of queries into the framework, such as spatial joins and aggregate queries. They also plan to optimize the performance of the framework. For example, so far the safe regions for KNN queries are computed separately; so the final safe region of the object p.sr may not be optimal. To achieve a larger p.sr, they are going to develop algorithms which incrementally update the so-far computed p.sr for each relevant query.

STUDY OF PROBLEM

The CSP may return incorrect results unintentionally because of bugs in the implementation of query processing algorithms.

- The CSP (or the adversary who compromised it) may intentionally tamper with the query results. For example, in the restaurant-finding scenario mentioned above, a restaurant may be ranked higher than other restaurants just

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because the CSP is sponsored by that restaurant.

- To cut costs or avoid performance bottlenecks in peak hours, the CSP may return incomplete results by carrying out the query evaluation process partially.

PROPOSED METHOD

In this section, the system discuses about the proposed system and the contributions of the thesis. The first one is the introduction about the LASQ authentication method. This starts with the discussion about the authentication problem in a fixed subspace and then extends it to arbitrary subspaces.

Contribution of the proposed system:

This work presents a novel index structure Index based tree, for efficiently authenticating location search queries in large outsourced spatial databases.

- The proposed system introduces a new index for answering spatial queries efficiently which embeds nearest search and sequence of services.
- This has seen plenty of applications calling for a search engine that is able to efficiently support novel forms of spatial queries that are integrated with keyword search. The existing solutions to such queries either incur prohibitive space consumption or are unable to give real time answers.
- The system implements the Location Point based Tree (LPT) structure for Location storage.
- The proposed system has remedied the situation by developing an access method called the location skyline inverted index (LSI-index).
- This implements a pre-fetching-based approach for authenticating continuous LASQs. This approach enables the clients to re-evaluate new LASQ results locally during movement, thus reducing both communication and computation costs.

Advantages:

- Reduces the storage overhead in the existing VO (verification Object).
- Provides better utilization.

The proposed system has the ability to perform keyword based nearest neighbor authenticated search in time.

Furthermore, as the LSI-index is based on the arbitrary technology of inverted index, it is readily incorporable in a commercial search engine that applies massive parallelism, implying its immediate industrial merits.

Guarantees the freshness of query results is a very challenging issue.

Algorithm1: LPT maintenance tree

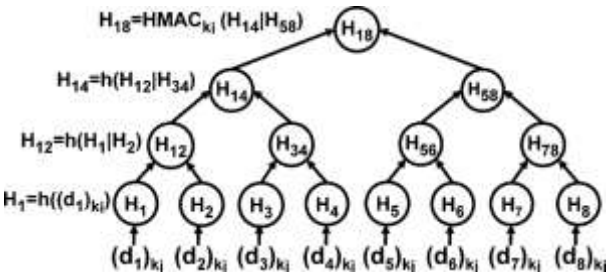
Steps:

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 sign 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.

***Location skyline inverted index* (LSI-index):**

The location based inverted index helps to track all the service related to the user query. For fast search LSI index method has been proposed to provide appropriate service, the point selection also helps to avoid the malpractice in service selection by CSP.

The proposed system designed a variant of skyline inverted index that is optimized for multidimensional points with reference keys and is thus named the Location *skyline inverted index* (LSI-index). This access method successfully incorporates point coordinates into a conventional inverted index with small extra space which is owing to a delicate compact storage scheme for security. Meanwhile an LSI-index preserves the spatial locality of data points and signatures, and comes with an LPT built on every inverted list at little space overhead. Finally it offers two competing ways for skyline query processing in location based search. This can consecutively merge multiple lists very much like merging traditional inverted lists by unique id of each object. This can also leverage the LP trees to browse the points of all relevant lists in ascending order of their distances to the query point by CSP.



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The Merkle hash tree used in the skyline processing solution has two special properties that allow the CSP to verify data result. First, the value of the root is computed using a keyed HMAC function, where the key is, the key shared between client and the CSP

EXPERIMETS

This section gives the experiments process of the proposed system. The system performs the following process.

Data Station Launch.

The Data Station Broadcast Launch module Used to start the Server. Its enable the Server IP Address and port address to listening the client nodes. It also lists the active nodes currently in the Client side. Here the Admin only has the privileges to start the server.

The server can add service details such as name, location and other contact details. Here the admin can click on the map to get the exact point of the area, which they need to add into database. Creation of spatial datasets dynamically may help the user to get the updated information from the service. The first module contains the appropriate service registration process.

Mobile Host Creation:

In this module the Admin going to enter the mobile host details such as Mobile Host Id, Mobile Host Name, Password and Location .It will used to connect the clients. In later these details are used to connect the appropriate clients.

The mobile host is the end user of spatial string search. The user can register their selves and can login into the system. This process helps to track the user interest and searching history from the server. The host id is an unique id, which has been created using random function. The system will automatically provide an id when registration process in progress.

Location Details Update

In this module Admin update the Category, Category name, Address and location. These detail service are fully depends on the clients. Through this details other clients are going to search the location based queries.

This module rank tuples using an aggregate score function on their attribute values. In this module we will defines the top-k spatial preference query problem and describes the index structures for the datasets

Sending skyline Queries :

The sending mobile host skyline module used to send the Location based spatial query to the Server. The Clients are the privileged person to send the Query to the server. They get the Response based on the Locations .These details are resided in the spatial database of the server.

- If user enters a query first it checks with all databases.
- The query available in any of the above databases, the query and count are updated in the corresponding databases.
- If user enters the same query, It will be stored in Cache memory.
- Similarly, in order to cache and reuse the intermediate results among different queries, we utilize the materialized views in databases for Results.

Retrieving service.

In this module the client node search the nearest nodes to get the response if that node contains the particular query it will response to the corresponding client otherwise the query forwarded to the server. Then the server Filter details based on the query and those details are sending to the client.

OBJECT EVALUATION AND COMPARISON

The overall query latency is reduced by up to 25% and the verification size is reduced by up to 60%. This is because the dataset cardinality of existing system is much larger so that it has more redundant objects in the full-space LPT results. As such, the proposed Location Point-tree method can filter out more objects from the verification to save the communication cost. The Basic algorithm needs to extract the final LASQ results from a much larger candidate set, i.e., the full-space skyline set. Hence, it also costs more server time than Uniform, Skewed and LPTpurity, inter-cluster similarity and intra-cluster similarity.

Experiments were carried out to compare the performances of skewed algorithm and Proposed LPT Algorithm by varying the number of the transactions. The variation of indexing speed with the change in number of transactions is studied for these algorithms.

Methods	Basic	Uniform	Skewed	LPT
VerificationTime	1	1	1	0.9
Server Time	35	31	29	27
Data Size	14	13	12	11

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Comparison table

By comparing the verification speed for various numbers of transactions, it is observed that the LPT algorithm has relatively good performance compared to skewed algorithm.

CONCLUSION

In the proposed model the system studied the problem of authenticating location-based skyline queries in road network datasets using location point tree LSI index method. The system has introduced a new LP-tree authentication method by implementing the work on skyline query authentication. To enable authentication for large scale datasets and subspaces along with performance improvement, he system further proposed a service verification method, in which most of the redundant objects can be easily identified and filtered out from the verification object. For authenticating location and continuous query verification, the system has proposed a pre-fetching-based solution to avoid frequent query issuances on transmissions, the system also preserves the data freshness in the data retrieval. The proposed scheme also concentrated on the authentication of dynamic objects. So every object will be authenticated at every service query.

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