An optimized Path Finding Technique for Location based Service using Ant Colony Algorithm

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ABSTRACT
In today's world the large usage of smart phones and GPS enabled devices, which provides location based services, the necessity of outsourcing spatial data has grown rapidly over the past some years. Delivering a spatial database to the cloud provides a flexible and economical way for the data owner to deliver spatial data to users that uses location based services. In this data owner delegates management of its database to the third party instant of directly served the request of clients. We propose an efficient road network optimized path finding technique using ant colony algorithm. We are also comparing ant colony with Dijkstra's algorithm. Unlike previous work that consider only one data owner party but we are considering multi data owner party. This experiment will run on Google Android mobile devices.

Keywords
Spatial database outsourcing, location-based service, service provider, voronoi diagram, spatial query.

1. INTRODUCTION
For creating a versatile ecosystem by the combination of two that is mobile devices and cloud based solution for reshaping the pattern geospatial data are stored, managed, served, and shared. In this proposed ecosystem, managements of its database are given to the third party cloud service provider from the data owner itself. The role of servicee provider is to indexing the data, answering the client queries or requests and updating the data on requests from the data owner. Now service provider will serve the request of clients and return the result to the client from service provider instant of data owner. In this paper, we study one of those concern like outsourcing the spatial database provides more efficient, economical and flexible solution for the data owner.

Another one is query integrity concern. Because we delegates the management of the database to the third party serviced provider which will not always trustworthy. It might return wrong result out of its own interest because service provider is not a real data owner. For that we are using network voronoi diagram. Our main focus is to calculate optimized path from n possible paths for that we are using an Ant colony algorithm. We are also considering multi data owner party with general framework. For multi data owner party we are going to used MONA technique, which provide flexible way for sharing multi data owner party data. Existing system used the RSA cryptosystem for query integrity assurance but now we are going to replace by the AES algorithm, to make system more efficient than previous one.

2. LITERATURE REVIEW
G. Rakshak, Amit Pimpalkar. [1][2] Gives the description of the optimized path finding technique on road network using ant colony algorithm. Yinan Jing et al. [3] An economical and flexible way for data owners to deliver spatial data by outsourcing spatial databases to the cloud to users of location-based services. Thus, in the database outsourcing paradigm, service provider i.e. third party is not always trustworthy; therefore, verifying spatial query integrity is critical. It includes road network which is efficient *k*-nearest-neighbor query verification technique that utilizes the network Voronoi diagram and neighbors to prove the integrity of query results. This approach needs to verify both the distances and the shortest paths from the query point to its kNN results on the road network using KNN algorithm. They evaluate their approach on real-world road networks together with both real and synthetic points of interest datasets. They used digital signature and RSA cryptosystem for query integration assurance. Client will receive the result from the third party service provider which may be untrustworthy. They might send wrong result out of their interest for query integration assurance play a very important role that result is generated from real data owner party.

Tiwari etal. [4] in distributed database query optimization is very difficult combinatorial optimization problem with complicated objective functions for that they need more efficient algorithm i.e. Ant colony algorithm. Ant colony algorithm will use to find the optimized shortest path from 'n' possible outcomes. There is one decision point from that they will calculate shortest among them. Krzysztof Jankowski etal.[5] The level of interest in Galois Counter Mode (GCM) Authenticated Encryption rose significantly within the last few years. GCM is interesting because it is the only authenticated encryption standard. GCM can be implemented in a fully parallelized or pipelined way. It is the most appropriate for encrypting packetized data. To reduce computational latency per block they introduce process N 128-bit data blocks in single-loop iteration. One thing to notice is that the exact number of simultaneously processed blocks depends on the number of available registers and cache size. This approach by its nature is designed for larger data payloads.Xuefeng Liu etal. [6] For sharing group resource among the group of cloud users with the character of low maintenance, economical and efficient solution provided by the cloud computing.They propose MONA technique, it is sharing scheme for secure multi owner, for dynamic groups in the cloud. By taking the help of group signature and dynamic broadcast encryption techniques, any users of the cloud can anonymously share data with the other cloud user with respective signature. That method allows also for pipelining H. Samet etal. [7] Presented a solution to explore the entire spatial network by pre-computing the shortest paths between all the vertices in the network and using a shortest path quad-tree to capture spatial coherence.

To overcome shortcomings, k. C. K. Lee etal. [8] Proposed a query framework named ROAD, which organizes a large road network as a hierarchy of interconnected regional sub

networks. ROAD maintains objects separately from a given network and adopts an effective search space pruning technique to enhance search performance. Nevertheless, none of the aforementioned mechanisms has considered the query integrity problem. E. Mykletun etal. [9] they provided techniques based on digital signature aggregation, that is used to ensure data integrity and authenticity for outsourced databases. However, one problem with this technique is that, it cannot assure completeness of the result set. H. Pang etal. [10] employed an aggregated signature in order to sign each record with the information from neighboring records by assuming that all the records are sorted in a certain order. Their mechanism helps users verify that query results are both complete and authentic. Lei Zhang et al. [11] Existing authentication protocols to secure vehicular ad hoc networks (VANETs) come with the challenges such as certificate distribution and revocation, avoidance of computation and communication bottlenecks, and decrease of the strong reliance on tamper-proof devices. Majid Khan etal. [12] Database management involves indexing of data by tagging information based on some common factors and corresponding criteria. Performance of SQL query against a production database eventually becomes an issue sooner or later.

3. WORKING SYSTEM

In that system KNN i.e. K Nearest Neighbors technique was used in the existing system to calculate the optimized nearest neighbor. In that they used network voronoi diagram, which used to calculate both distance and path. Their focus was on query integrity assurance for that they used the digital signature and RSA cryptosystem. Because services provided to the client from service provider who is third party i.e. not a real data owner, to verify that data coming from the service provider belong to the real data owner. This all handle by the query integrity assurance. To calculate the shortest among the n possible path, existing system used the Dijkstra's algorithm. But to make existing system more efficient we are using another algorithm to calculate the shortest path instead of Dijkstra's algorithm.We are going to use the Ant Colony Algorithm to calculate the optimized path. This algorithm is used to calculate the shortest among the 'n' possible path. For the authentication purpose existing system used the RSA cryptosystem but now in the proposed work we are going to use AES algorithm. AES algorithm is more efficient one for the authentication purpose. In AES algorithm also there is concept of the public key and private key.

The previous system considered only one data owner party but our approach is to consider multi data owner party. For that we are using the MONA technique i.e. secure multi owner data sharing. In this technique multi owner can share their respective data with one another securely. MONA technique provides the efficient and flexible way of multi data owner to share their data with one another securely. As existing system consider one data owner party but we are considering multi data owner party with the help of the MONA technique. One another concept is handling of the spatial queries. Spatial query handled in the existence system but we are trying to handle the spatial multiple queries from different network.

Ant colony algorithm play a important role in our propose plan to calculate the shortest path from the given 'n' possible path.The below figure is architecture of proposed plan. In that Android clients will contact to the service provider instant of data owner. Service provider will serve the request of client i.e. optimized path finding with the help of the Ant Colony algorithm. Multi data owner will cooperate with the help of MONA technique. In our proposed work we are extending existing work, by making system for the multi data owner party. Similarly we are going to replace some algorithm with the efficient one to make system more powerful like Ant Colony algorithm, MONA technique and AES algorithm. From the above diagram we have to create graphical user interface for the android user, so that user can send the request to service provider. Service provider have role to serve the request of the clients and will return result back to the client

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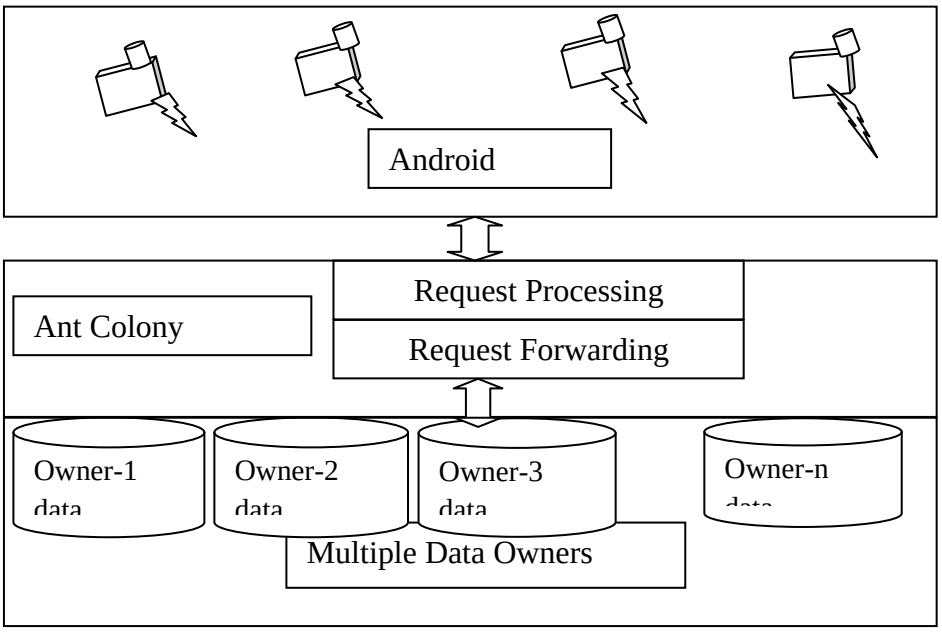

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Figure: Architecture of proposed plan

For query integrity assurance when client receive the verification object from the service provider, then client has to verify the correctness and completeness from the real data owner. However, updating of the database will done by service provider when receive the request from the real data owner through network voronoi diagram.Updating of the

outsource database is done by the data owner itself. This can be possible by updating the point of interest in the network diagram or road network updates. We have to follow three basic steps to update the spatial database. First is network vonoroi diagram should be update by the data owner. Second step is update the authenticate data structure those affected and renew their data structure. Third is data owner has to transmit all the related update to the service provider, so that service provider will update all spatial data in the database.

4. IMPLIMENTATION

Our implementation started by creating the interface for android device at client side. At server side we are applying Ant Colony algorithm to calculate the shortest path. We also implement AES algorithm for authenticate user login. With the help of this user can sign up and login. Username and password stored in encrypted form into the database. There is Sqlite database in Android. After successful user login, have to insert name of destination in the field. We are also comparing result of Ant colony Algorithm and Dijkstra's Algorithm.Figure 4 shows for enter the destination, after that there is window for comparison of two algorithm. The output of both the algorithms as shown in figure 6 and figure 7.The below diagrams show the flow of execution. Client side implementation done in Android for that we used Eclipse as a platform. At server, implementation done in JAVA with NetBeans IDE 7.4 as a platform.

Figure 1: Sign UP and Sign In Page

Figure 2: Sign UP registration form

Figure 3: Sign in Using username and password

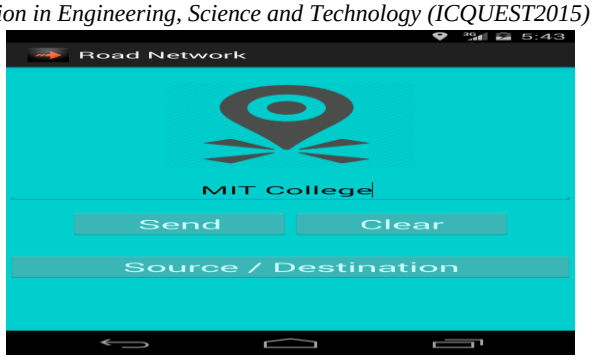

Figure 4: For enter the location

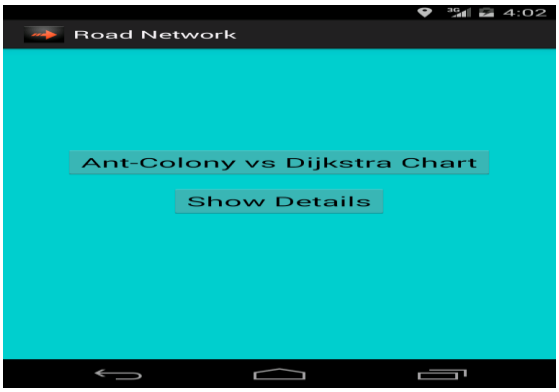

Figure 5: Comparisons of two Algorithms.

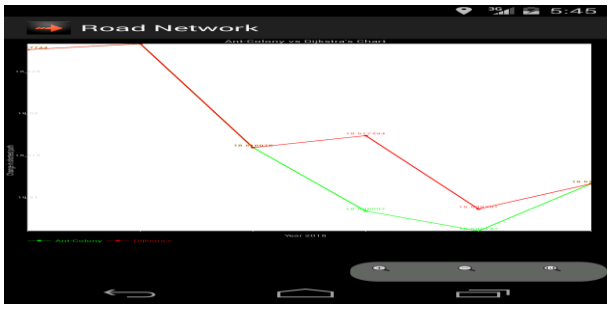

Figure 6: Output Using Ant Colony Algorithm and Dijkstra's Algorithm .

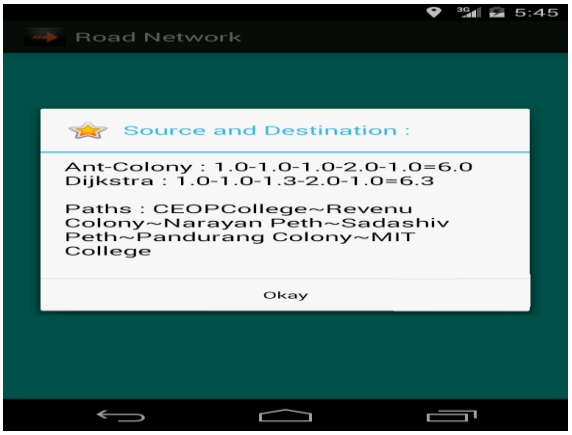

Figure: Detail result of ant colony and dijikstra algorithm

5. RESULT AND DISCUSSION

This experiment will run on Google Android mobile devices, service provider will communicate to the mobile android users through wireless connection .Input and output processing will

performed on the android mobile devices. Service provider will serve the request of the client instate of the data owner.

6. CONCLUSION

In this paper, our main objective is to find the optimized path i.e. shortest path. Existing system considers only one data owner party for outsourcing the database. But we are considering multiple data owners; this can be achieved with the help of the MONA technique, which secure multi owner data sharing. We are going to handle more types of network spatial queries using the general framework and data structure. To make existing system more efficient we are replacing some existing algorithm with another one like RSA with AES.

The future work may include:

- In applications in design and optimization on wireless sensor networks, network routing technologies, and other intelligence applications.
- In future we can integrate with Facebook API.

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8. AUTHORS PROFILE

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