



International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijirce.com

Vol. 4, Issue 12, December 2016

A Query Based Algorithm for Optimal Location Search

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ABSTRACT: We design a location-aware keyword query suggestion framework. We propose a weighted keyword-document graph, which captures both the semantic relevance between keyword queries and the spatial distance between the resulting documents and the user location. The graph is browsed in a random-walk-with-restart fashion to select the keyword queries with the highest scores as suggestions. To make our framework scalable, we propose a partition-based approach that outperforms the baseline algorithm by up to an order of magnitude. The appropriateness of our framework and the performance of the algorithms are evaluated using real data.

KEYWORDS: Keyword Document Graph, Keyword queries, Spatial distance, Baseline Algorithm

I. INTRODUCTION

Data mining is the information of domain we are mining like concept hierarchies, to organize attributes onto various levels of abstraction. A Spatial Keyword query is an approach of searching qualified spatial objects by considering both the query requester's location and user specified keywords. Taking both spatial and keyword requirements into account, the goal of a spatial keyword query is to efficiently find results that satisfy all the conditions of a search. Searching is a common activity happening in data mining. This motivated to develop methods to retrieve spatial objects. A spatial objects consists of objects associated with spatial features. In other words, spatial objects involve spatial data along with longitude and latitude of location. The importance of spatial databases is reflected by the convenience of modeling entities of reality in a geometric manner. For example, locations of restaurants, hotels, hospitals and so on are often represented as points in a map, while larger extents such as parks, lakes, and landscapes often as a combination of rectangles. Many functionalities of a spatial database are useful in various ways in specific contexts. For instance, in a geography information system, range search can be deployed to find all restaurants in a certain area, while nearest neighbor retrieval can discover the restaurant closest to a given address. However, existing keyword suggestion techniques do not consider the locations of the users and the query results. Users often have difficulties in expressing their web search needs they may not know the keywords. After submitting a keyword query, the user may not be satisfied with the results. Writing the queries is never easy because usually queries are short and words are ambiguous because user may not know how to use query in web search so that we suggest a user to use a single word query it makes the user to feel comfortable when they enter a keyword query. However, none of the existing methods provide location aware keyword query suggestion, such that the suggested keyword queries can retrieve documents not only related to the user information needs but also located near the user location. This requirement emerges due to the popularity of spatial keyword search that takes a user location and user-supplied keyword query as arguments and returns objects that are spatially close and textually relevant to these arguments. For example the tourist may also search for all the hotels which are within 10 miles of the airport and provide the two amenities in order to compare the hotels' reviews and prices. For retrieving the qualified hotels, the tourist will launch a Fast Nearest Search query with ranking parameters for the first search; the query results are hotels. Last, we test our query suggestion approach on the search log. The experimental results clearly show that our approach outperforms keyword document graph and fast nearest search in both coverage and quality of suggestions



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II. RELATED WORK

1. A query suggestion log analysis. P. Kato, T. Sakai, and K. Tanaka, "When do people use query suggestion? Inf. Retr., vol. 16, no. 6, pp. 725–746, 2013.
Search engines should provide better assistance especially when rare or single-term queries are input, and that they should dynamically provide query suggestions according to the searcher's current state. It will further investigate the usage of query suggestion with data sets including user information to propose a query reformulation taxonomy specifically designed for query suggestion classification, and to improve query suggestion functionality based on our insights.
2. Agglomerative clustering of a search engine query log, D. Beeferman and A. Berger, in KDD, 2000, pp. 407–416.
It introduces a technique for mining a collection of user transactions with an Internet search engine to discover clusters of similar queries and similar URLs. The information we exploit is "clickthrough data": each record consists of a user's query to a search engine along with the URL which the user selected from among the candidates offered by the search engine. It is not resolved by the work is how best to combine the complementary strategies of content ignorant and content-aware clustering. Each method has weakness
3. Query recommendation using query logs in search engines, R. Baeza-Yates, C. Hurtado, and M. Mendoza, in EDBT, 2004, pp. 588–596.
A given a query submitted to a search engine, suggests a list of related queries. The related queries are based in previously issued queries, and can be issued by the user to the search engine to tune or redirect the search process. It will further improve the notion of interest of the suggested queries and to develop other notions of interest for the query recommender system. For example, finding queries that share words but not clicked URL's
4. Location Aware Keyword Query Suggestion based on Document Proximity" Shuyao Qi, Dingming Wu, and Nikos Mamoulis, in IEEE, 2015, pp. 82–97.
Keyword suggestion techniques consider the locations of the users and the query results. This approach is very useful to find the nearest location of the user. After submitting a keyword query, the user may satisfy with the results. Existing keyword suggestion techniques do not consider the locations of the users and the query results. Users often have difficulties in expressing their web search needs they may not know the keywords. After submitting

III. SYSTEM ARCHITECTURE

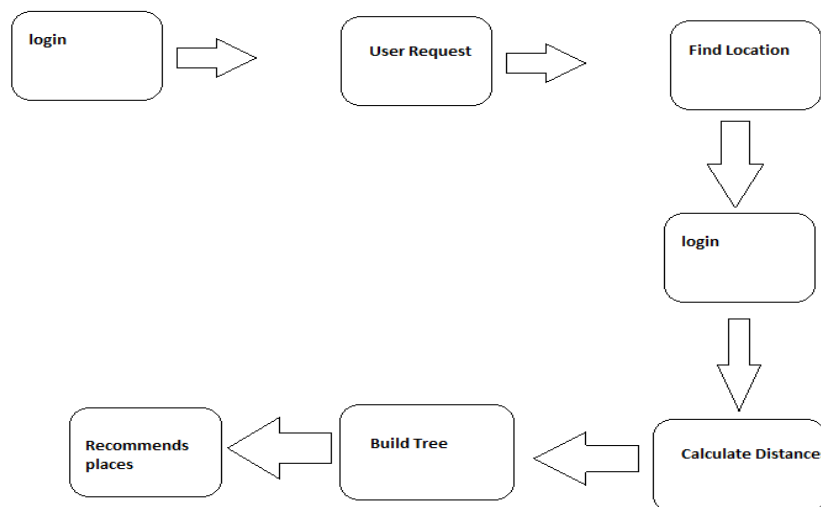


Fig 1. Proposed System Architecture



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We proposed to providing keyword suggestions that are relevant to the user information needs and at the same time can retrieve relevant documents near ideas, but aims at optimizing different objective functions. The concept of prestige-based spatial keyword search. The SI-index comes with two query algorithms based on merging and distance browsing respectively. To design a variant of inverted index that is optimized for multidimensional points, and is thus named the Spatial Inverted index (SI-index). To remedy the situation by developing an access method called the spatial inverted index (SI-index). Not only that the SI-index is fairly space economical, but also it has the ability to perform keyword augmented nearest neighbor search in time that is at the order of dozens of milli-seconds

ADVANTAGES OF PROPOSED SYSTEM

1. Keyword suggestion techniques consider the locations of the users and the query results
2. This approach is very useful to find the nearest location of the user.
3. After submitting a keyword query, the user may satisfy with the results.

III. SYSTEM ANALYSIS

Keyword suggestion in web search helps users to access relevant information without having to know how to precisely express their queries. Existing keyword suggestion techniques do not consider the locations of the users and the query results; i.e., the spatial proximity of a user to the retrieved results is not taken as a factor in the recommendation. However, the relevance of search results in many applications (e.g., location-based services) they did not give the correct correlation. A baseline algorithm extended from algorithm BCA is introduced to solve the problem. Then, we proposed a partition-based algorithm (PA) which computes the scores of the candidate keyword queries at the partition level and utilizes a lazy mechanism to greatly reduce the computational cost. The performance of the proposed algorithms is low.

IV. CONCLUSION

In this paper, we proposed an LKS framework providing keyword suggestions that are relevant to the user information needs and at the same time can retrieve relevant documents near the user location. A baseline algorithm extended from algorithm BCA is introduced to solve the problem then, we proposed a partition-based algorithm which computes the scores of the candidate keyword queries at the partition level and utilizes a lazy mechanism to greatly reduce the computational cost. Empirical studies are conducted to study the effectiveness of our LKS framework and the performance of the proposed algorithms. The result shows that the framework can offer useful suggestions and that PA outperforms the baseline algorithm significantly. In the future, we plan to further study the effectiveness of the LKS framework by collecting more data and designing a benchmark. In addition, subject to the availability of data, we will adapt and test LKS for the case where the locations of the query issuers are available in the query log. Finally, We believe that PA can also be applied to accelerate RWR on general graphs with dynamic edge weights; we will investigate this potential in the future.

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