IJARCCE
ISSN (Online) 2278-1021
ISSN (Print) 2319 5940
International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 6, Issue 11, November 2017

Location Based Travel Route Recommendation

Divya Haridas[1], Prof. T.K.P. Rajagopal[2]

M.E.(CSE) Student, Department of CSE, Kathir College of Engineering, Coimbatore[1]

Associate Professor and Head, Department of CSE, Kathir College of Engineering, Coimbatore[2]

Abstract: Trajectory search has long been an attractive and challenging topic which blooms various interesting applications in spatial-temporal databases. In this work, we study a new problem of searching trajectories by locations, in which context the query is only a small set of locations with or without an order specified, while the target is to find the k Best-connected Trajectories (k-BCT) from a database such that the k-BCT best connect the designated locations geographically. Different from the conventional trajectory search that looks for similar trajectories w.r.t. shape or other criteria by using a sample query trajectory, we focus on the goodness of connection provided by a trajectory to the specified query locations. This new query can benefit users in many novel applications such as trip planning.

Keywords: Location, Route, Travel, Recommendation, Trajectories

I. INTRODUCTION

In our work, we firstly define a new similarity function for measuring how well a trajectory connects the query locations, with both spatial distance and order constraint being considered. Upon the observation that the number of query locations is normally small (e.g. 10 or less) since it is impractical for a user to input too many locations, we analyze the feasibility of using a general-purpose spatial index to achieve efficient k-BCT search, based on a simple Incremental kNN based Algorithm (IKNN). The IKNN effectively prunes and refines trajectories by using the devised lower bound and upper bound of similarity. Our contributions mainly lie in adapting the best-first and depth-first k-NN algorithms to the basic IKNN properly, and more importantly ensuring the efficiency in both search effort and memory usage. An in-depth study on the adaption and it efficiency is provided. Further optimization is also presented to accelerate the IKNN algorithm. Finally, we verify the efficiency of the algorithm by extensive experiments.

We study a new problem of searching the k Best-Connected Trajectories from a database by using a set of locations with or without an order constraint. Since the number of query locations is typically small, it enables us to adopt a spatial method for answering a similarity search query. We start the study based on a simple IKNN algorithm and then analyze the efficiency of different variants. As a conclusion, we would say that the BF-O achieves the best query performance although involving a risk of high memory usage. The pure DF-C algorithm, although guarantees a low memory consumption, performs poorly in efficiency. Therefore, we further devise the DF-D-M and DF-D-M-O to improve the DF-C for less R-tree node access and shorter query time, and finally their performance are theoretically and experimentally confirmed to be close to that of the BF.

The massive amount of trajectory data collected from GPS has emerged in recent year. Many researchers proposed trajectory queries such as top-k query. They focused to solve them based on distance and text relevance. However, the weight of these queries is unknown. Therefore, we plan to handle the trajectory skyline query based on distance and activity keywords. Furthermore, with the huge amount of keyword semantic trajectories, user may put the wrong activity keyword to search its trajectory. Therefore, it's hard to extract the trajectory based on the exact keyword activity. In this paper, we focused to handle the trajectory fuzzy problem based on edit distance and activity weight. To accelerate the query processing, initially, we used a Distributed Mining Trajectory based on R-tree DMTR-Tree to organize the big trajectory data, then we developed an efficient algorithm to handle the trajectory skyline query. Also, for a rapid computation of the algorithm, we used the cluster computing framework of Apache Spark with Map Reduce as programming model. Theoretical analysis and the experimental results show that query-processing algorithm is efficient and achieve the scalability.

II. DOMAIN OVERVIEW

Researches on Location-Based Service (LBS) have been emerging in recent years due to a wide range of potential applications. One of the active topics is the mining and prediction of mobile movements and associated transactions. Most of existing studies focus on discovering mobile patterns from the whole logs. However, this kind of patterns may not be precise enough for predictions since the differentiated mobile behaviors among users and temporal periods are not considered. In this paper, we propose a novel algorithm, namely, Cluster-based Temporal Mobile Sequential Pattern Mine (CTMSP-Mine), to discover the Cluster-based Temporal Mobile Sequential Patterns (CTMSPs). Moreover, a prediction strategy is proposed to predict the subsequent mobile behaviors. In CTMSP-Mine, user clusters are

IJARCCE
ISSN (Online) 2278-1021
ISSN (Print) 2319 5940
International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 6, Issue 11, November 2017

constructed by a novel algorithm named Cluster-Object-based Smart Cluster Affinity Search Technique (CO-Smart-CAST) and similarities between users are evaluated by the proposed measure, Location-Based Service Alignment (LBS-Alignment). Meanwhile, a time segmentation approach is presented to find segmenting time intervals where similar mobile characteristics exist. To our best knowledge, this is the first work on mining and prediction of mobile behaviors with considerations of user relations and temporal property simultaneously. Through experimental evaluation under various simulated conditions, the proposed methods are shown to deliver excellent performance.

III. EXISTING SYSTEM

With the popularity of social media (e.g., Facebook and Flicker), users can easily share their check-in records and photos during their trips. In view of the huge number of user historical mobility records in social media, we aim with the popularity of social media (e.g., Facebook and Flicker), users can easily share their check-in records and photos during their trips. In view of the huge number of user historical mobility records in social media, we aim to discover travel experiences to facilitate trip planning. When planning a trip, users always have specific preferences regarding their trips. Instead of restricting users to limited query options such as locations, activities or time periods, we consider arbitrary text descriptions as keywords about personalized requirements. Moreover, a diverse and representative set of recommended travel routes is needed.

IV. PROPOSED SYSTEM

To evaluate the historical model (HM) and social-historical model (SHM), we choose three baseline models, i.e., Most Frequent Check-in model (MFC), Most Frequent Time model (MFT), and Order-k Markov Model based on our review of related work (to discuss later). The MFC baseline model considers the power-law property simply in aspect of rich-get-richer effect. The MFT model considers the temporal pattern only, which was used in (Cho, Myers, and Leskovec 2011) for comparison with their periodic model. Since our proposed models do not attempt to model periodic behavior, we focus on the social and historical sequence of check-ins Integrating periodic patterns in HM and SHM will be an extension of this work. The Order-k Markov Model considers the short-term effect of historical check-ins, which is reported as a state-of-the-art prediction algorithm for location prediction Foursquare, one of the most popular LBSNs, to study the social-historical ties on LBSNs. Foursquare has more than 15 million members as of June, 20114 and keeps growing every month. For a particular user on Foursquare, we get his check-in history with timestamps and his friendship information. Since Foursquare does not provide APIs to collect personal check-ins, we are not able to get the check in history directly from Foursquare. However, members on Foursquare can choose to list on their Twitter account and automatically publish their check-in messages as tweets on Twitter. We can access these tweets through Twitter's public REST API. A check-in tweet contains a unique URL that points to a Foursquare web page including the geographical information of this check-in location. We get check-ins with timestamps ranging from August, 2010 to November, 2011. Instead of crawling the friendships on Twitter as done in (Scellato et al. 2011), we collect the user's social ties directly from Foursquare to keep the friendships identical to the Foursquare social circle. In our experiment, we consider the users who have at least 10 check-ins. We obtain 43,108 unique geographical locations as the location vocabulary. Some key statistics of the dataset.

V. ARCHITECTURE DIAGRAM

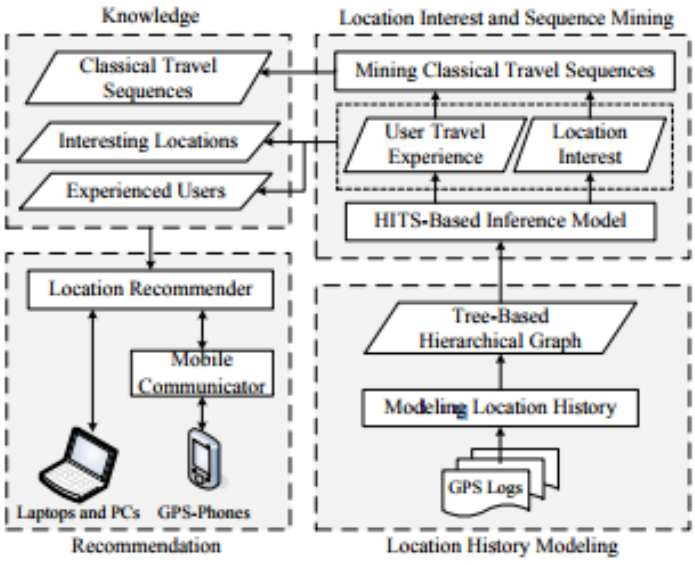

Fig 1. Architecture of the system

IJARCCE
ISSN (Online) 2278-1021
ISSN (Print) 2319 5940
International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 6, Issue 11, November 2017

Elaborated on mining and ranking existing routes from check-in data. To meet the need for automatic trip organization, we claim that more features of Places of Interest (POIs) should be extractedIn recent years, a number of studies have been done on Location-Based Service (LBS) due to the wide applications. One important research issue is the tracking and prediction of users' mobile behavior. In this paper, we propose a novel data mining algorithm named TMSP-Mine for efficiently discovering the Temporal Mobile Sequential Patterns (TMSPs) of users in LBS environments. To our best knowledge, this is the first work on mining the mobile sequential patterns associated with moving paths and time intervals in LBS environments. Furthermore, we propose novel location prediction strategies that utilize the discovered TMSPs to effectively predict the next movement of mobile users. Finally, we conducted a series of experiments to evaluate the performance of the proposed method under different system conditions by varying various parameters.

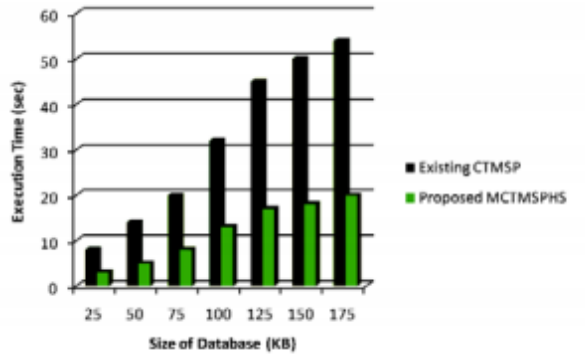

Fig 2. Size of database Vs Execution time

The problem of recommending tours to travellers is an important and broadly studied area. Suggested solutions include various approaches of points-of-interest (POI) recommendation and route planning. We consider the task of recommending a sequence of POIs, that simultaneously uses information about POIs and routes. Our approach unifies the treatment of various sources of information by representing them as features in machine learning algorithms, enabling us to learn from past behaviour. Information about POIs are used to learn a POI ranking model that accounts for the start and end points of tours. Data about previous trajectories are used for learning transition patterns between POIs that enable us to recommend probable routes. In addition, a probabilistic model is proposed to combine the results of POI ranking and the POI to POI transitions

VI. CONCLUSION

In this paper proposed a novel method named TMSP-Mine for efficient TMSPs mining in LBS environments. Furthermore, we have proposed novel location prediction strategies that utilize the discovered TMSPs to effectively predict the next movement of mobile users. Moreover, we have designed the fitness function of genetic algorithm to generate the most proper time segmentation intervals. Although there exist a number of studies exploring various approaches for mobile behavior prediction, few of them consider the issues of moving paths and time intervals together in pattern mining. To our best knowledge, this is the first work on mining the mobile sequential patterns associated with moving paths and time intervals simultaneously. To evaluate the performance of the proposed method, we designed a simulator reflecting a reasonable movement model and conducted a series of experiments. The experiments can be divided into three parts, 1) time interval segmentation, 2) TMSPs mining, and 3) behavior prediction. For the time interval segmentation experiments, it is shown that our method can obtain the most proper and correct time interval segmentation. For the TMSPs mining, the number of users and minimal support are varied to evaluate the performance of TMSP-Mine in terms of execution time and it is shown that our method is scalable even under the large number of transaction logs (100K) and the smaller support threshold (0.06%). For the behavior prediction, we observed that TMSP outperforms SMAP, MSP, and TMAP in terms of precision and F-measure. The experimental results demonstrate that our proposed methods are efficient and accurate under different system conditions. As to the future work, we will try to apply our method on real datasets in LBS environments. In addition, we will apply the TMSP-Mine on other applications like GPS navigation with the aim to enhance the precision for predicting user behaviors.

REFERNCES

[1] R. Agrawal, T. Imielinski, and A. Swami. Mining Association Rule between Sets of Items in Large Databases. Proceedings of the ACM SIGMOD Conference on Management of Data, pages 207-216, Washington, D.C., May 1993.
[2] R. Agrawal and R. Srikant. Mining Sequential Patterns. Proceedings of International Conference on Data Engineering, pages 3-14, Taipei, Taiwan , March 1995.
[3] M. S. Chen, J. Han, and P. Yu. Data Mining: An Overview from Database Perspective. IEEE Transactions on Knowledge and Data Engineering, Vol. 8, No. 6, pages 866- 883, December 1996.
[4] M. Halvey, T. Keane, and B. Smyth. Time-Based Segmentation of Log Data for User Navigation Prediction in Personalization. Proceeding of the International Conference on Web Intelligence, pages 636-640, France, September 2005.

[5] M. Halvey, T. Keane, and B. Smyth. Time Based Patterns in Mobile-Internet Surfing. Proceeding of the SIGCHI Conference on Human Factors in Computing Systems, pages 31-34, Montreal, Quebec, Canada, April 2006.
[6] J. Holland, Adaptation in Natural and artificial system. University of Michigan Press, Ann Arbor, 1975.
[7] S. C. Lee, J. Paik, J. Ok, I. Song, and U. M. Kim. Efficient Mining of User Behaviors by Temporal Mobile Access Patterns. International Journal of Computer Science Security, Vol. 7, No. 2, pages 285-291, February 2007.
[8] Y. B. Lin. GSM Network Signaling. ACM Mobile Computing and Communication, Vol. 1, No. 2, pages 11-16, 1997.
[9] E. Modiano and A. Ephremides. Efficient Algorithms for Performing Packet Broadcasts in a Mesh Network. IEEE/ACM Transaction on Networking, Vol. 4, No. 4, pages 639-648, August 1996.
[10] J. B. Schafer, J. Konstan, and J. Riedl. Recommender systems in E-commerce. Proceeding of ACM Conference on Electronic Commerce, pages 158-166, Denver, Co, November 1999.
[11] Vincent S. Tseng, J. C. Chang, and Kawuu W. Lin. Mining and Prediction of Temporal Navigation Patterns For Personalized Services in E-Commerce. Proceeding of the ACM Symposium on Applied Computing, pages 867-871, Dijon, France, April 2006.
[12] Vincent S. Tseng and W. C. Lin. Mining Sequential Mobile Access Patterns Efficiently in Mobile Web Systems. Proceeding of International Conference on Advanced Information Networking and Applications, pages 867-871, Taipei, Taiwan, March 2005.
[13] Vincent S. Tseng, Kawuu W. Lin. Efficient Mining and Prediction of User Behavior Patterns in Mobile Web Systems. Information and Software Technology, Vol. 48, No. 6, page 357-369, June 2006.
[14] U. Varshney, R. J. Vetter, and R. Kalakota. Mobile Commerce: A New Frontier. IEEE Computer, Vol. 33, No. 10, page 32-38, October 2000.
[15] J. Veijalainene. Transaction in Mobile Electronic Commerce. Proceeding of International Workshop on Foundations of Models and Languages for Data and Objects, pages 203-227, Dagstuhl Castle, Germany, September 1999.