IJCSE International Journal of Computer Sciences and Engineering Open Access
Survey Paper Vol.-6, Issue-12, Dec 2018 E-ISSN: 2347-2693

Travel Route Recommendation System using Big-Multisource Social Media: A Survey

Shital.N.Raul[1*], Nitin N. Patil[2]

[1]Dept. of Computer Engineering, R. C. Patel Institute of Technology, Shirpur, India
[2]Dept. of Computer Engineering, R. C. Patel Institute of Technology Shirpur, India

[*]*Corresponding Author: shitalraul11@gmail.com, Mob: 9730850259*

Available online at: www.ijcseonline.org

Accepted: 05/Dec/2018, Published: 31/Dec/20188

Abstract— In the era of internet, social media has become a big boom for Internet users. These users used to share their day-to-day activities on social media sites like Facebook, Twitter, Flicker and so on. Different data gets uploaded related to users activities like check-ins, GPS locations, tagging friends, travel routes, shopping, dining and photos. The comfort of user convenience has resulted in tremendously increased user count of the Internet. Simultaneously, it is also leading to building of information as a huge database of places, routes, services etc. Considering these all things, our targeted work is to build an enhanced travel advisory and recommendation system. Such a system gives complete freedom to users for choosing their suitable trip options. The users gets able to fetch complete information like statistics of users visited given place, available facilities and most importantly preferred travel routes. All this information can have associated cost options for ease of decision-making. With the help of social media activities like recommendations, likes/dislikes, posts, shares, tags and check-in information, it can build automatic trip advisor to provide better travelling experience with cost-saving and user convenient features. This diverse database can provide features like text-based and pictorial search module. Thus the available maps and locations help users to synchronize their actions with existing routes along with probable route restructuring functionality. Also uses can use the combination of skyline representative concepts and keyword extraction module for appropriate decision making to choose the best place from multiple Places-of Interest (POIs).

Keywords— Recommendation System, Decision Making, User Convenience, Keyword Extraction, Skyline Representative

I. INTRODUCTION

Big Data feature to efficiently handling of huge data with various forms have boosted the Information Technology industry .The system big data to handle heterogeneous schema data GPS-tagged photos, photos, locations, tags, travel routes, shopping, dining and reviews from the web. Big data reduces the cost of the system by using low-cost processors and disk spaces [1, 2].

The data mining is used to retrieve spatial objects from a spatial database. Spatial objects involve spatial data along with longitude and latitude of a location (GPS locations). Check-in information is mined from passive check-ins to enrich the input data. GPS-tagged photos are larger in scale than foursquare check-ins. This mining thus improves the coverage of the input data. Querying such data is called best keyword cover querying. Previously, the nearest neighbour search was focusing only on distance, but now spatial data will play a major role [3,4].

The current era of developing technology changes everyone's way of life. Now most of the people have advanced Mobiles with high-resolution cameras, GPS navigation facility and high-speed internet. These features allow people to easily share photos, locations, travel routes, shopping, dining and reviews, tag friends on the web. This can form all-inclusive database which is useful for many systems. In this paper, we review the concepts related to building travel advisory and recommendation program till now by various researchers. Users can be able to fetch complete information like statistics of users visited given place, available facilities, and most useful travel routes chosen by other users. All this information is associated with cost options and for ease of decision-making. For example, when someone planning to trip in Maharashtra state then one would include Mumbai and Ajanta Elora [5].

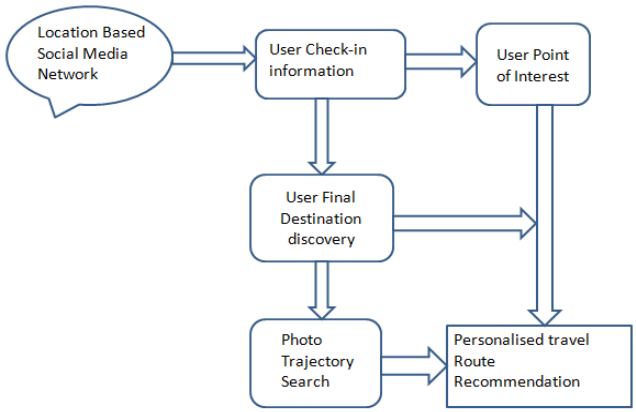

Figure 1.System Flow diagram

The Figure 1 shows the flow of one of the personalised recommendation system. A system which gives all possible routes ranked with different criteria like travel time, a number of restaurants and facilities available, popularity by other users travelled. Finding the most interesting locations in a city as well as the travel sequences among these locations is a general task that a tourist wants to fulfil when travelling to an unfamiliar city.

The keyword-based Route Ranking algorithm ranks several routes as per different keywords used by different users to explain their requirements. There are two different sections in this module, one is offline and other is online. In offline, route ranking can be done by using existing database tags, photos comments made by other users. Also, new criteria for ranking can be added to the system. Those might be seasonal or trend-wise e.g. the route which ranked as the topmost scenic in monsoon may not be at the top in the summer [6,7].

In the online section, gathering real-time information from users, developing the user-friendly interface, finding trends in user activities can be included. The most important feature of this is keyword recognition and translate in terms of ranking criteria .The experiments are included in this system where some number of users feed data in the system like tags, photos, routes and comments [8].

The Big Data applications to process tremendous data with different formats loaded into the database. Big data allows effective data analysis and prediction platform to achieve fast response and real-time classification. This is almost impossible for other software and tools used for normal data processing. To recover this, data mining can be used to optimal route search using a spatial-keyword on spatial objects stored in the spatial database. For this, the authors have proposed the algorithm which allows fast data retrieval as per rating, relevance and usage of a keyword. Spatial networks have been extensively studied, particularly when dealing with transportation and mobility networks, Internet router connections, power grids, urban road networks and other systems where nodes are embedded in a metric space [9].

II. RELATED WORK

In this section we review various work done till now by researchers for travel route recommendation:

Yuki Arase and Xing Xie have proposed the well-defined idea of a photo trip organization and suggested frequent photo trip pattern mining algorithms with this algorithms user get various different trip ideas from social media photo collections on the Web. First of all, geo-tagged photos of photo trips are collected and then categorized into their trip melodies. Further frequent photo trip patterns as arrangements of frequently visited cities and their classic visit durations are detected accordingly. Additionally, tags including their topographical coverage to add descriptions of photo trip patterns are mined so that people understand them according to their preferred pattern[1].

Zaiben Chen et al. have solved the problem of penetrating routes by their exact positions, in which setting the query is only a trivial set of positions with or without a number sequence specified. In this the target is to find the k Best-Connected Trajectories (k-BCT) from a database. This will lead to the k-BCT best to connect the elected locations geographically. For the typically small number of request positions, it enables to espouse a spatial method for answering a similarity search query. Authors' study is based on a simple IKNN algorithm. They later analyzed the efficiency of different variants. As a result, BF-O accomplishes the best query performance although concerning a risk of high memory usage [2].

Hongzhi Yin et al. have introduced the concept of newly evolving social network services. It provides a new support to understand users' partialities based on their activity history. In this the introduced user-item matrix is very sparse, which creates a large task to the traditional collaborative filtering-based recommender systems. The problem becomes even more challenging when people travel to a new city where they have no activity information. So authors proposed LCARS, a location-content-aware recommender system that offers a specific user a set of venues (e.g. restaurants and shopping malls) or events (e.g. concerts and exhibitions) by giving consideration to both personal interest and local preference [3].

To accelerate the online process, a climbable query processing technique is developed which extends both the Threshold Algorithm (TA) and TA-approximation

algorithms. The performance of the system was evaluated by using two datasets like Douban Event and Foursquare' and one 'large-scale synthetic dataset'. The consequences show the dominance of LCARS in recommending spatial items for users travelling to new cities, in terms of both effectiveness and efficiency[4].

Dawei Chen et al. have implemented a system for recommending the appropriate tours to the intended users. The authors used various approaches like points-of-interest (POI) recommendation and route forecasting. The assignment of recommending a sequence of POIs was contemplated which instantaneously uses information about POIs and routes. This approach uses the treatment of various causes of information by expressive them as features in machine learning algorithms, enabling to learn from past behaviour. The required data about POIs are cast-off to acquire a POI status model that accounts for the start and end points of tours. The historical data of the point of interest are used for learning changeover patterns between POIs that empower us to recommend probable routes. Also investigation about the thoroughgoing likelihood sequence approach of recommending sub tours was conducted to offer a better-quality sequence recommendation method. The feature ambitious approach naturally allows learning the combination of POI ranks and routes. The authors also argue for performance measure with respect to the visiting order of POIs and a new pairs-F1 metric was suggested too [5].

M. Clements etal. predicted comparable and selective locations based on the user's geo-tags in geographically isolated location for users that visited larger cities and provides an instance of efficient recommendation based on a mock user profile. Also a resemblance between the geo tag circulations of two users based on a Gaussian kernel involvedness is defined. The social media photo information is combined and used the user for relocation of famous places or city for this user[6].

D. Chen, etal. proposed trips to voyagers based on study of various resolutions of POI suggested route planning. One can anticipate task of recommending user of POI's that uses information about POI's and route. This approach covers the several sources of material it can represent as machine learning algorithm. It can learn as historical behavior information of POI to start and stop point of tour[7].

B. Zheng et al. have proposed the location standing technique and popular location allocation services through which semantic supplemented data have been unprecedentedly available. While finding POI, it can study user locations and query keyword in past years. In this work the authors studied the problem of keyword search in massive semantic trajectories. The approximate semantic trajectory returns the k trajectories that contain relevant keyword query. The main difference between AKQST and conventional spatial keyword is that there is no query location AKQST that results in the search which cannot be localized[8].

Y.T. Wen et al. have studied the exploring social influence on location-based social networks. Now a days with the universalization of mobile network, the location-based service(LBS) has made great progresses, proving as an efficient marketing instrument for enterprises. Every business man want to select good quality product for store and try to use marketing techniques to improve business. But customer cannot choose appropriate store without proper information as there is huge number of choices available. So here is the option to use location based service(LBS) and make available recommendation method to user by analyzing user track and what he wants to purchase i.e. point of interest of user[8,9].

In an approach called as hot route discovery, the work is done related to the hot route discovery problem, which aims to identify routes that are frequently travelled. Li et al. proposed a density based algorithm which process for flow scan to extract hot routes according to the definition of 'traffic density-reachable'[10].

An on-line algorithm is also developed by Sacharid is et al. for searching and maintaining hot motion paths that are travelled by at least a certain number of moving objects. But these two work are intended for mining paths with high traffic only. Besides, mining trajectory patterns could potentially help in discovering mining T-pattern, which is a sequence of temporally and not at end points and target to find out all T-patterns whose support is not less than a minimum support threshold [11].

In another implementation, existing sequential pattern mining algorithms are adopted to explore frequent path segments or sequences of points of interest. In mining periodic movements through region is investigated. These pattern can indicate a popular movement between certain locations. Hence if the start and end locations of the query are right on the pattern, it can be suggested to the user as a recommended route. However, one cannot apply these approaches since the query in our work has arbitrary locations and may not match with any existing pattern [12].

The first section of this paper, we briefly introduced the existing system for 'Travel Route Recommendation' and the related concepts. In second section, we reviewed various research work done by various authors in this domain. The final section summarizes conclusions and future work for recommending best suitable travel route for tourists.

III. CONCLUSION AND FUTURE SCOPE

In this paper, we studied the need of travel route recommendation system for the intended users. The travel routes are related to all type of user preference keywords to improve the effectiveness of sequence mining and grouping users based on their location histories. As per the literature survey and rigorous analysis, it is found that the service recommendation system works accurately on the basis of sentimental analysis. It helps to compute negative and positive reviews of the previous user with the help of user updates on various social media sites. User can choose their point of interest and on the basis of their interest, time stamp, season and/or location, the system can recommend a travel sequence to particular user.

This motivates the researcher for further research where one can elaborate how to deal with the live data for recommendation for expected accuracy. In our future work, we target to suggest a better recommender system for tour by improving existing system**.**

REFERENCES

[1]. Y. Arase, X. Xie, T. Hara, and S. Nishio. "Mining people' strip from large scale geo-tagged photos". In Proceedings of the 18th ACM international conference on Multimedia, pages 133–142. ACM, 2010.

[2]. X. Cao, L. Chen, G. Cong, and X. Xiao. Keyword-aware optimal route search. Proceedings of the VLDB Endowment, 5(11):1136–1147, 2012.

[3]. H. Yin, B. Cui, Y. Sun, Z. Hu, and L. Chen. LCARS: A spatial item recommender system. ACM Transactions on Information Systems (TOIS), 32(3):11, 2014.

[4]. D. Chen, C. S. Ong, and L. Xie. Learning points and routes to recommend trajectories. In Proceedings of the 25th ACM International on Conference on Information and Knowledge Management, pages 2227–2232, 2016.

[5]. M. Clements, P. Serdyukov, A. De Vries, and M. Reinders ,Using Flicker Geo Tag To Predict User Travel Behavior, In proceeding of the 33rd International ACMSIGIR Conference Research Development Information Retrieval, 2010

[6]. D. Chen, C. S. Ong, and L. Xie," Learning Points And Routes To Recommend Trajectories." In Proceedings of the 25th ACM International Conference On Information And Knowledge Management, 2016

[7]. B. Zheng, N. J. Yuan, K. Zheng, X. Xie, S. Sadiq , and X. Zhou, "Approximate Keyword Search In Semantic Trajectory Database" In Data Engineering (ICDE), IEEE 31st International Conference,2015.

[8]. W. T. Hsu, Y. T. Wen, L. Y. Wei, and W. C. Peng, -Skyline travel routes: Exploring skyline for trip planning,‖ in Proceed. IEEE 15th Int. Conf. Mobile Data Manage., 2014, pp. 31–36.

[9]. X. Cao, G. Cong, and C. S. Jensen. Mining significant semantic locations from GPS data. Proceedings of the VLDB Endowment, 1009–1020, 2010.

[10]. A. Kapadia, F. Adu-Oppong, C. K. Gardiner, and P. P. Tsang, "Social circles: Tackling privacy in social networks," in Proc. Symp. Usable Privacy Security, 2008.

[11]. X. Li, J. Han, J. Lee, and H. Gonzalez, "Traffic density-based discovery of hot routes in road networks," Advances in Spatial and Temporal Databases, pp. 441–459, 2007.

[12]. D. Sacharidis, K. Patroumpas, M. Terrovitis, V. Kantere, M. Potamias, K. Mouratidis, and T. Sellis, "On-line discovery of hot motion paths," in EDBT, 2008, pp. 392–403.

[13]. J. Patel and D. DeWitt, "Partition based spatial-merge join," ACM SIGMOD Record, vol. 25, no. 2, pp. 259–270, 1996.

