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Perlustration on Techno Level Classification of Location Based Services

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ABSTRACT

All over the world more than half of the people are coming out for shopping. Though shopping is one of the basic needs of the people, they don't show much importance to it due to lack of activeness and high cost. Most of the people think that all costly products are quality products and run towards Shopping Malls. However, all costly products are not quality products and all cheap products are not low in quality. Nowadays most of the online shopping is not reliable and fake products are also sold via online. In this paper, we developed a commodity search system that can search and filter the nearby shops which sell the desired products based on the customer's budget. This task is performed using Nearest Neighbour Search and Branch & Bound Algorithm. The Nearest Neighbour Search is used to search the best route, Whereas Branch and Bound Algorithm is used to select the customer's budget. Detailed information of related product and shops are displayed in the result, together with a navigation map showing the best route to the target shops. If the desired product is not available nearby, substitutes in the same category will be recommended for the users.

Keywords: *CSS (Commodity Search System), NNS (Nearest Neighbour Search), BB (Branch and Bound), Location-Based Searching, Budget-Based Searching, Substitute Product Recommendation, Web Application.*

1. INTRODUCTION

Location information is important in many computing applications. The budding meeting and integration of digital communication technology pedestal on mobile networks, obsessed by the triumph of Internet technology, are now focused on offer services that are related to the location of individuals. Such services are generally referred to as LBSs and can be defined as services that integrate a mobile device's location or position with other information so as to provide added value to a user. They can be a glimpse as the meeting of mobile services, location-aware technologies with the Internet and GIS. Thus, an assortment of systems of LBSs should be able to amalgamate information related to information (mapping) and geographic position, multimedia content and address location functionalities, searching, and routing, with user-specified contour and gist. LBSs are met in multiple fields and applications. They have been a glimpse as a key for differentiating between the fixed Internet worlds and mobile, in view of the fact that LBS get the most out of the temperament of mobility by bringing together the user and his/her abrupt environment. The most interesting approaches distinct LBS the applications into a Person/device oriented and the push/pull services. The Quality Service (QoS) provided depends on the consumed architecture that would support differentiated service levels, all of which assurances a restricted QoS. Nowadays, the advance of Internet and Web technologies have continuously boosted the prosperity of e-commerce. Through the Internet, it has become daily life for people to online shopping, and the number of people buying, selling and performing transactions on the Web is increasing at a phenomenal pace. With the further development of e-commerce, it will not be easy for customers to single out the best commodity when faced with the massive commodity information on the Internet. Usually, customers utilize various E-commerce search engines to search and compare commodities when they do online shopping on the Internet. Therefore, E-commerce search engines have largely become the main methods for a customer to acquire commodity information and relevant services in the course of e-commerce activities. However, common search engines (such as Google, baidu, etc) and keyword-based search are not only low-efficient but also sometimes the retrieved document contents of web pages are non-relevant with customer's query. The main reasons that result in these problems are: 1) the traditional information search techniques cannot express the semantic information correctly, and the information search based on keyword-matching still causes the semantic inaccuracy of retrieved results. 2) The heterogeneous characteristic of information organization is very obvious because of the diversity of e-commerce platform and the standard deficiency of relevant domain information description. 3) There are still not effective commodity evaluation and comparison mechanism so as to cause the information overload of the retrieval results. In order to solve the existent problems that traditional information search methods have, many scholars both at home and abroad propose many new web search approaches, which are based on ontology and semantic web. All of these methods can solve the semantic inaccuracy of information to some extent, and can realize the semantic accordance between the customer's query and document information.

2. RELATED WORKS

"CityTransfer: Transferring Inter- and Intra-City Knowledge for Chain Store Site Recommendation based on Multi-Source Urban Data", Bin Guo, Jing Li, Vincent W. Zheng, Zhu Wang, and Zhiwen Yu(2017) They have suggested a model based on the features of existing chain stores in the city and then predict what other sites are suitable for running a new one. However, these models do not work when a chain enterprise wants to open a business in a new city where there is not enough data about this chain store. To solve the cold-start problem, we propose CityTransfer, which transfers chain store knowledge from semantically-relevant domains (e.g., other cities with rich knowledge, similar chain enterprises in the target city) for chain store placement recommendation in a new city. In particular, city transfers a two-fold knowledge transfer framework based on collaborative filtering, which consists of the transfer rating prediction model, the inter-city knowledge association method, and the intra-city semantic extraction method. Experiments using data of chain hotels from four different cities crawled from Ctrip (a popular travel reservation website in China) and the urban characters extracted from several other data sources validate the effectiveness of our approach on store site recommendation.

"Joint Representation Learning for Location-Based Social Networks with Multi-Grained Sequential Contexts", WayneXin Zhao, Feifan Fan, Ji-Rong Wen, and Edward Y. Chang (2018). They have suggested a representation learning method for LBSNs called as JRLM++, which models check-in sequences together with social connections. To capture sequential relatedness, JRLM++ characterizes two levels of sequential contexts, namely fine-grained and coarse-grained contexts. We present a learning algorithm tailored to the hierarchical architecture of the proposed model. We conduct extensive experiments on two important applications using real-world datasets. The experimental results demonstrate the superiority of our model. The proposed model can generate effective representations for both users and locations in the same embedding space, which can be further utilized to improve multiple LBSN tasks.

"Objectives and State-of-the-Art of Location-Based Social Network Recommender Systems" Zhijun Ding, Xiaolun Li, Changjun Jiang, and MengChu Zhou (2018). They have suggested a recommender system built on location-based social networks (LBSNs). The former mine users' preferences through the relationship between users and items, e.g., online commodity, movies, and music. The latter add location information as a new dimension to the former, hence resulting in a three-dimensional relationship among users, locations, and activities. In this article, we summarize LBSN recommender systems from the perspective of such a relationship. User, activity, and location are called objects, and recommender objectives are formed and achieved by mining and using such 3D relationships. From the perspective of the 3D relationship among these objects, we summarize the state-of-the-art of LBSN recommender systems to fulfill the related objectives. We finally indicate some future research directions in this area.

"Shop-type recommendation leveraging the data from social media and location-based services", Zhiwen Yu, Miao Tian, Zhu Wang, Bin Guo, and Tao Mei. 2016. They have suggested a recommendation of shop types for a given location, by leveraging heterogeneous data that are mainly historical user preferences and location context from social media and LBS. Our goal is to select the most suitable shop type, seeking to maximize the number of customers served from a candidate set of types. We propose a novel bias learning matrix factorization method with feature fusion for shop popularity prediction. Features are defined and extracted from two perspectives: location, where features are closely related to location characteristics, and commercial, where features are about the relationships between shops in the neighborhood. Experimental results show that the proposed method outperforms state-of-the-art solutions.

"Location Still Matters: Evidence from an Online Shopping Field Experiment", John Morgan, David Ong and Zemin (Zachary) Zhong1 (2017). They have suggested many empirical studies of online price dispersion show that sellers post different prices for homogeneous goods. However, seller heterogeneity is difficult to control for and posted prices may not reflect price dispersion in actual transactions. We contribute to this literature by selling identical simple goods (cell phone credits) at different prices from sellers that were identical except in name and with minimal ratings. The only way consumers could find us in this extremely thick market is to rank by price from lowest to highest. Out of 514 sales, 73 were of the higher priced item, for which we had non-negligible demand even when the price gap was 2.5%. Thus, even this selected sample of price-sensitive consumers do not necessarily buy the lowest priced item, all else being equal. Using independent variation in screen location and price, we are able to distinguish for the first time between search cost and limited attention based price dispersion.

"Beyond the random location of shopping malls: A GIS perspective in Amman, Jordan", Amjad Ahmad Abu ELSamena, Rund Ibrahim Hiyasat. They have suggested shopping mall location selection in the area of West Amman in Jordan. Following the Time-Resistance Approach, ArcGIS's Network Analyst tool was used to calculate the distance in terms of minutes to reach each shopping mall using Geographical Information Systems (GIS) techniques. Results: The area under study, which covers multiple sub-districts, suffers from excessive oversupply, due to the lack of established planning criteria and regulations, which in turn has resulted in high population-to-retail area- ratio. This result was further supported by referring to other evaluation criteria, including the planning criteria used in other countries such as UAE and Saudi Arabia.

"A cost-based integrated importance measure of system components for preventive maintenance", HongyanDuia, Shubin Sib,*, Richard C.M. Yamc. They have suggested two problems: a) the preventive maintenance time of the selected component may be bigger than the maintenance time of the failed component; b) the most important component may incur the highest maintenance cost. Traditional importance measures do not consider the possible effect of maintenance time and cost, which significantly affect the improvement of system reliability. Given the joint effect of component maintenance cost and time on system reliability, this study proposes a cost-based integrated importance measure (IIM) to identify the component or group of components that may be selected for preventive maintenance. The characteristics of cost-based IIM are examined to determine the relationships among failure rates, shape parameters, and the scale parameters of different components. Finally, an application to a wind turbine system is used to illustrate its usage.

"Reduction in consumers' purchasing cost by online shopping", KosukeMiyatake a, ToshinoriNemoto a, Satoshi Nakaharai a, Katsuhiko Hayashi b. They have suggested how the online shopping affects retailer's selling cost and consumer's purchasing cost compared with the case of shopping at brick-and-mortar stores. Furthermore, we examine how delivery manners affects retailer's and consumer's cost, concluding that the online shopping retailers should clearly introduce the delivery charge independent from the price of the items.

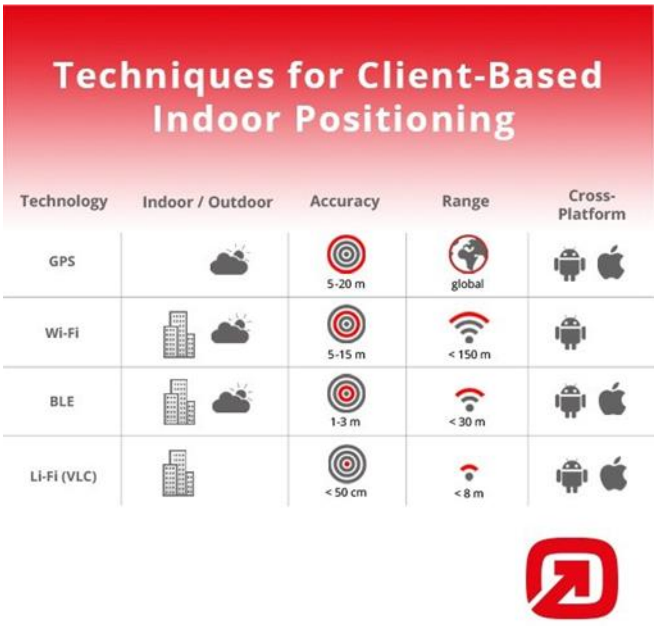
3. BACKGROUND OF LOCATION-BASED SERVICES

Location-Based Services (LBS) are able to assist the way people interact with the world. LBS is used almost exclusively for navigation, but there are many aspects of navigation which can be assisted with the use of this technology. Seeing that Location-Based Services are tied to the location of a user, navigation is perhaps the core used for LBS.

Forms of Navigation

Indoor Navigation:

The idea of navigating through indoor spaces with mobile devices is not a new one, but constant advancements in both the technological capabilities and availability of these mobile devices have meant the ability to easily set up systems to navigate indoors is much easier. In later sections, we will cover how indoor navigation is accomplished.

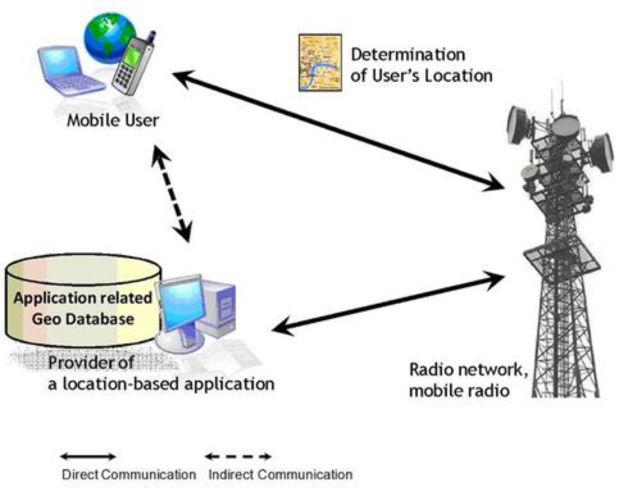


Outdoor Navigation:
Navigation with the use of maps has existed for thousands of years, but with mobile devices, users are now able to find their way through technological means such as GPS. Location Based Services are able to build upon this foundation to provide more extensive assistance in the area of outdoor navigation.

4. ARCHITECTURE OF LOCATION BASED SERVICES

Location-based services (LBS), which are a general class of computer program-level services that use location data to control features, are widely used in a variety of contexts, such as financial services, transport, leisure travel, healthcare, automotive, ad agencies, etc. Users only need to input a geographical position, then the LBS can provide the most relevant information to them. For example, when an individual is traveling in a strange place, LBS can help him/her locate some places, such as tourist attractions, hotel, the nearest hospital and so on. For providing more flexible and convenient LBS, polygons spatial query has been proposed and attracted considerable interest recently.

The system model focuses on how to provide an accurate and efficient polygon spatial query over outsourced cloud server without divulging the LBS data and the query information, and it consists of four parts: Authority (AU), LBS provider (LP), LBS User (LU), and Cloud Server (CS).



Components of LBS

The component requirement of LBS includes the following.

Mobile Devices:

A mobile device is a tool used by the user to request the information. Possible devices are Personal Digital Assistants (PDA), Mobile phones, Laptops, navigation unit of a car and so on. The user requests via any of the above devices and the result can be given by speech, using pictures, text and so on.

Communication Network:

The mobile network plays a major role in LBS by transferring the user data and the service requests from the mobile terminal to the service provider and then transfers the requested information from the service provider to the user.

Positioning Component:

The requests placed by the mobile devices are communicated to the service provider via the communication network. For the request to be processed, the service provider has to determine the position of the mobile devices. The position can be obtained either by using the Global Positioning Systems (GPS) for outdoor positioning or active badges, radio beacons for indoor positioning. If the position is not determined automatically it can also be specified manually by the user.

Service and Application Provider:

The service provider offers a number of different services to the user and is responsible for the service request processing. Such services offer the calculation of the position, finding a route, searching yellow pages with respect to position or searching specific information on objects of user interest.

Data and Content Provider:

All the information that can be requested by the users is not stored and maintained by the service providers. Geographic information and Location-based information is requested from the maintaining authority or industry partners who maintain the requisite information. Action of LBS on Data

There are five main and important acts of positioning data depending on the needs of the user. i. **Locating**: locating where the user is with respect to somebody or some object. ii. **Searching**: searching a particular object, person or an event. iii. **Navigating**: Searching a way to the distinct point. iv**. Identifying:** retrieving the properties of a location. v. **Checking:** look for events at or nearby a certain location the two basic actions via locating and navigating mainly rely on geospatial information. Searching, identifying and checking needs a bigger variety of different information viz.

Static Information- contents such as yellow pages which stay constant over a period of time and could be used by other media as well

Topical Information that may change while the user is on the move such as traffic information and weather forecasts

Safety Information like roadside help in a situation when the car breaks down

Types of Services in LBS Services in LBS are distinguished by two major kinds in accordance with the information delivery to the user.

Pull Services deliver information directly requested by the user. This is similar to call a website on the Internet by filling in its address in the web browser-address field. Pull service are further classified into functional service like ordering a taxi or an ambulance by just pressing a button on the device and information service like searching the nearest Indian restaurant.

Push services deliver information which is either indirectly or not requested from the user, which are activated by an event, which could be triggered if a specific area or location is entered or triggered by a timer. Indirectly requested information could be a news service subscription of a particular city, while not requested information could be the advertisements or warning messages. Since push services are not bound by previous user interaction with the service, they are more complex to establish [3]. In LBS, the position service plays a major role in determining the accurate location of the user. The next section discusses the various available positioning techniques.
Positioning Techniques Positioning techniques are classified into two groups:

Network-Based Positioning- The base station network is used for tracking and evaluating the user location. The device either sends the signal or is sensed by the network.

Terminal-based Positioning- the location is calculated by the user device itself from signals received from base stations. **Global Positioning Systems (**GPS) belongs to this group where GPS satellites are used. Positioning techniques can be implemented in two ways- Self-positioning and remote positioning. If the positioning receiver makes an appropriate signal measurement from geographically distributed transmitters and uses these measurements to determine its position, it is termed as Self- positioning and remote positioning is when a device can be located by measuring the signals traveling to and from a set of receivers.

Significance and Applications of Location Based Services

Context-Aware Games:

Context Awareness is another variation of LBS especially used in games. For example, in a game, if playing environment and circumstances are generated according to the profile of current operator then the game becomes more interesting and attractive. This is an example of CAS based system. Often it is used interchangeably with LBS but actually, it is somewhat different from LBS. Context Awareness is a concept of performing operations depending upon the contrast. If the contrast is a location then this is said to LBS.

Location Tracking Services:

Location-tracking service is the second occasion of LBS application. The Location-tracking service system for the children or the elderly has been developed for safety purpose. Besides, Cyber Minder is an intelligent reminding service, which allows the user to define complex conditions. Whenever a combined condition is fulfilled, the system generates a message box alert with voice. For example, the day is through Monday to Friday, time is 8 AM, and the location is "home", all conditions above are fulfilled will generate a reminder "It time to go to work".
Emergency, Safety and Medical/Health Services: many governments are moving to require cellular operators to develop the capability to automatically identify subscribers' locations in the event of an emergency. This data would then be forwarded to the appropriate public safety answering point to coordinate the dispatch of emergency personnel.

Information Services: A query about local theatres might be extended to focus only on those playing a specific movie. Or, rather than look for particular types of businesses, a customer may input a specific product, and ask for all businesses in the area that carry it. If the database includes other product information, such as prices and other terms, then real-time comparison shopping may be feasible en route or even inside stores. **Navigation/Routing**: in addition to identifying the location of various destinations, LBS can also be employed to guide users along the best routes. If integrated with real-time traffic data, such route guide services may also make routes contingent on current traffic conditions.

Other Applications of LBS: LBS is a concept that can be utilized widely. LBS can be applied in public and safety industry, such as emergency service in medical [10]; tracking industry[8], such as fleet management; personalization information industry, such as query the nearest restaurant; navigation industry, such as digital map; payment and so on. It can be particularly powerful when combined with other user profile information to offer personalized and location sensitive responses to customers; this form is called the context-aware system. Some instances can be described below.

Table 1. Survey on Location Based Services Techniques

S.NO	AUTHOR	TITLE	TECHNOLOGY USED	RESULT	ISSUES
1	Bin Guo, Jing Li, Vincent W. Zheng, Zhu Wang, and Zhiwen Yu(2017)	CityTransfer : Transferring Inter- and Intra-City Knowledge for Chain Store Site Recommendation based on Multi-Source Urban Data	Memory-based CF algorithms, *CityTransfer* algorithm, SVD-based CF algorithm, Joint Optimization Algorithm.	Designed a model based on the features of existing chain stores in the city and then predict what other sites are suitable for running a new one	Redundancy and noisy issues caused by extracting features from multi-source urban data
2	Wayne Xin Zhao, Feifan Fan, Ji-Rong Wen, and Edward Y. Chang(2018)	Joint Representation Learning for Location-Based Social Networks with Multi-Grained Sequential Contexts	Sequential pattern mining algorithms, raph-based sequence matching Algorithms, hierarchical learning algorithm.	Represented a learning method for LBSNs called as JRLM++, which models check-in sequences together with social connections	Data sparsity.
3	Zhijun Ding, Xiaolun Li, Changjun Jiang, and MengChu Zhou(2018)	Objectives and State-of-the-Art of Location-Based Social Network Recommender Systems	LBSN recommender algorithms, K-means algorithm, scalable optimization algorithm, dynamic clustering algorithm.	Designed recommender systems built on location-based social networks (LBSNs).	The location activity Matrix extracted from GPS trajectories is sparse.
4	Zhiwen Yu, Miao Tian, Zhu Wang, Bin Guo, and Tao Mei(2016)	Shop-type recommendation leveraging the data from social media and location-based services	matrix factorization algorithm, Bias Learning Algorithm, feature fusion algorithm, baseline algorithms,	Designed a model for the recommendation of shop types for a given location, by leveraging heterogeneous data that are mainly historical user preferences and location context from social media and LBS.	finding the Optimal type of shop that might attracts as many consumers as possible.
5	John Morgan, David Ong And Zemin(Zachary) Zhongi(2017)	Location Still Matters: Evidence from an Online Shopping Field Experiment	The precise algorithm, Location-based Algorithms.	proved that Location Still Matters from an Online Shopping Field Experiment	seller-product differences would occur in a market where the consumer's assessment of the product's use value is mostly or entirely divorced from after-sales service, returns policy.
6	Amjad Ahmad Abu ELSamena,, Rund Ibrahim Hiyasat(2016)	Beyond the random location of shopping malls: A GIS perspective in Amman, Jordan	Geographical Information Systems (GIS) Techniques, ArcGIS's Network Analyst tool, techniques of site selection.	examined shopping mall location selection in the area of West Amman in Jordan.	issues arise with the choice of model, as the lack of unified and agreed-upon models for location selection forms another limitation in the study.
7	Hongyan Duia, Shubin Sib,*, Richard C.M. Yamc(2017)	A cost-based integrated importance measure of system components for preventive maintenance	a) the preventive maintenance time of the selected component may be bigger than the maintenance time of the failed component. b) the the most important component may incur the highest maintenance cost.	Determined the relationships among failure rates, shape parameters, and the scale parameters of different components. Finally, an application to a wind turbine system is used to illustrate its usage.	the preventive maintenance time of the selected component may be bigger than the maintenance time of the failed component. the most important component may incur the highest maintenance cost.
8	Itay Hazan, Asaf Shab-	Dynamic radius and confidence predic-	Grid-based location prediction algorithms,	dynamically determined a confidence radius that	affect the prediction accuracy (e.g., the location

	tai(2017)	tion in grid-based location prediction algorithms	clustering algorithms, greedy algorithms,	Increases prediction accuracy while maintaining a small average radius.	sensors' natural error).
9	Kosuke Miyatake a, Toshinori Nemoto a, Satoshi Nakaharai a, Katsuhiko Hayashi b(2016)	Reduction in consumers' purchasing cost by online shopping	Precise algorithm	The online shopping retailers should clearly Introduced the delivery charge independent of the price of the items.	we hypothesize assumptions such as the number of clothes that consumer purchase and the unit value of Waiting time. These assumptions should also affect consumer's purchasing cost.

5. CONCLUSION

We could introduce LBS to development of many sciences, business, jobs and etc with attention to increasingly needing of human. Markets and even could be the causes of rescuing economical countries like we consider LBS discussions, such as general principle and their component and positioning. Data processing and other related topics in the presented paper.

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