

# Location Recommendation System on Point of Interest and Place-User Similarity



Deepika P, R.Parvathi

**Abstract:** Social Networking media and Internet handles ample ranging of the datasets and that can be synthesised and casted up to demonstrate the patterns ,drifts and association related to the nature of the individual and intercommunications. The rapid development of the networking connections made it further intricated to gain the required facts and figures from the voluminous data. The recommendation systems are the gadgets that proposes the users help with their requirements. Various filtering methods are available with which blend of two or more such methods provide hybrid variety of recommendation. This paper proposes a personalized location based recommendation based on two models i.e. point of interest and place-user similarity model respectively to produce more accurate recommendations. The developed models are evaluated with precision and recall measures.

**Keywords** -Social Networks, Intercommunication, Large Datasets, filtering methods, personalized location recommendation, point of interest, place-user similarity, precision, recall.

## I. INTRODUCTION

Social Networking is a process to construct, frame and elevate virtual associations and relationships amidst people online, ecommerce and so on. The Social network turns around like-minded singulars to have an effect upon the other websites and web applications. Websites lay down a path to do shopping online and helps the travellers as a local guide. The Recommendation schemes are the systems that propagate to distort the data strategies which supplies the projection about the evaluation or rating given to any location[1]. The recommender systems are broadly compartmentalized into three varieties as Collaborative filtering method, Content based method and Hybrid system i.e. combination of both collaborative and content based. The system provides the most fascinating suggestions to the users. The collaborative filtering method is the system developed resting upon the two models such as memory and model related respectively. The memory related approach utilizes the user-rating data to calculate the similarity amidst the user or items[2]. The model based is by using data mining and machine learning approaches to develop the model for the recommendations.

The content based is a method to compare the items between the user profile history. The problems or challenges in both the content and the collaborative techniques are over come by the combination of both techniques with some criteria[3].

The personalization is a word that refers to the process of making unique things or results for each of the problem or user. Here the dataset used is Gowalla dataset. In such a way personalization in the recommender system refers to the process of outsourcing more accurate results the user would probably like.

## II. METHODS

The recommender systems are the schemes to classify the data with likes and dislikes of the user relating upon various criteria. The collaborative filtering technique also refers the filtering of the social and economic data by availing the recommender systems of other people[4]. Most Collaborative methods are neighbourhood approach. The content based is the second approach in the recommender systems that suggests the products or places or contents to the user by their own history of rating the item, clicking the item or browsing the item. The dataset is collected from the Gowalla dataset. Every dataset for recommender systems consists of various attributes having some values to each one of the attributes. For example this model contains the placeid, userid, check-in time and so on. The total check-ins made by each unique user is computed and the total check-in by each user to each spot is also computed. The category of point of interest is calculated through the maximum check-ins made to each category by every unique user at a particular time interval. The Item and user combinations are considered in a matrix and the most frequent pattern of the matrix are considered for the place-user similarity model. Considering both the models that are developed for the recommender systems which produces the best recommendations for the users.

## III. LITERATURE SURVEY

Recommender systems and their ethical challenges [5]: The various kinds of recommendation systems are used to enhance the ease of utilization in the online applications. A survey of all the ethical challenges of a recommender system are handled.

Personalized Attraction Recommendation for Tourists [6]: Social Networking sites such as Facebook, Twitter, Gowalla, Foursquare contains huge volumes of check-in data that helps in providing recommendation for visitors. The friend's check-in places are compared with target user check-in and it is time consuming task. This paper introduces a PITS framework to minimal the interaction and to get the output , content based and collaboration methods are used.

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Survey on Recommendation Systems [7]: The recommender systems are the referred as the driven force for the recommendations that gets the ranking and reviews given by each of the user to accurately predict the locations to be recommended.

Based upon the scenario the recommender systems are categorized as below:

Collaborative Filtering System[3]: The two types of senses in the collaborative system in which one does the automated predictions and the other does the recommendation considering all the sources of data. The main intention of this system is to find the similar users with note to the fig 1.1.

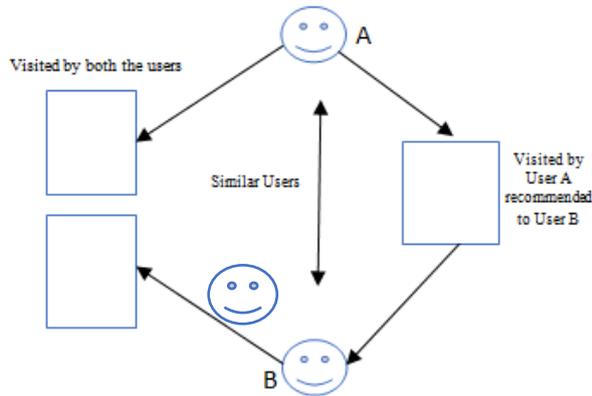


Fig 1.1 Collaborative Filtering

Content Based Filtering: The content depending filtering is a technique that produces the suggestion relying on the past history of user likes and dislikes are classified. With note to Fig1.2 the proposals are given based on prior travel.

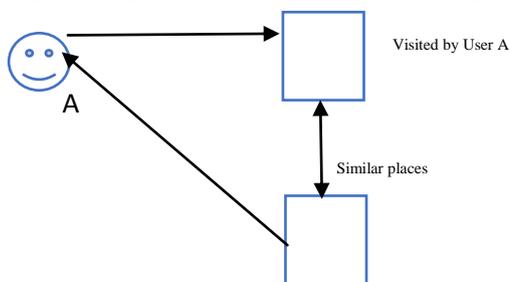


Fig 1.2 Content Based

Hybridized Recommendation: The combinatorial recommender system is mesh of both the Collaboratory and content systems. It looks for the prior activities or visits by the user and also similar users as figured in Fig1.3

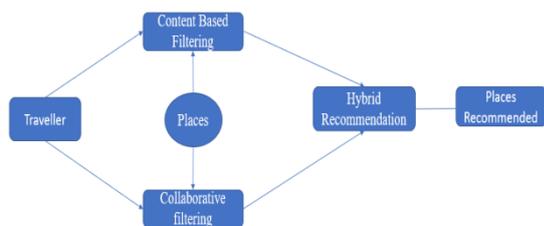


Fig 1.3 Hybridized

Time Preference aware Dynamic Recommendation [8]: Socially Sensible networking communities have many active users and such users provide data about where they are, with whom they are and time of visit. This paper takes

the data set from active users of social media and uses collaboration filtering to recommend the users relying on their temporal preference. This paper is proposed as POI recommendation that uses all the check-in-based information of users.

Location Recommendation based on Social trust [9]: The data set commonly used for most of the location recommender systems are data that are collected from social sensing media. Each edge in the friendship network is now allocated to values such as weight, node and influence and trust value of each node, weight and influence.

Point of Interest Recommendation in Location Based Social Networks [10]: The Location based social network generates a platform from visible world to the artificial world. This paper extracts the geographical data from socially sensing media and transition graph between each location and count of visit on each location is obtained. This approach is modelled for social, categorical, geographical, temporal and sequential consequences on visiting interest of the users.

A Novel Personalized Location Recommendation based on Proximity and Probability [11]: The process acquires all the travel history of the users. It uses Apache Kafka to produce and consume messages from the segregated topics. The KPBA (Knowledge Proximity Based Algorithm) makes the suggestions to the user. The probability measures are calculated whether the user has visited location yet or not. The proximity measures are used to give the list of suggestions resting on hybrid filtering.

IV. PROPOSED MODEL

The proposed model development goes into the gathering of datasets from the weeplaces dataset. The attributes are brought together with placeid, userid, spot name, time and date of the visit, location coordinates of each spot. From the collected data sources analyse the missing and inappropriate data for the model. Find :

- a) Total check-ins grouped by the spotid.
- b) Number of check-ins to each spot by each of the user.

The popularity based recommender scheme has been designed to provide recommendations for the cold start problem that is when the particular user has no prior history of travel records. Based on the consequences in the travel records, extract the categorical POI of each user by total number of check-ins in a particular category divided by total number of check-ins.

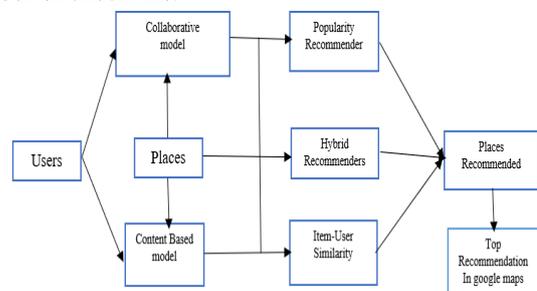


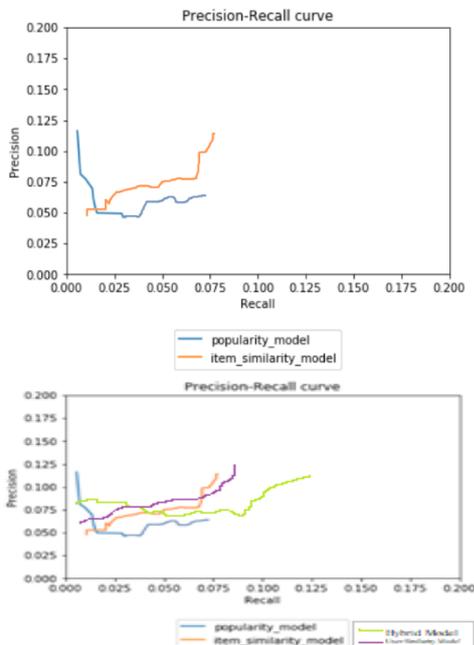
Fig 1.4 Popularity Model

The item and user similarity model developed at the stage of the process to provide more likely recommendations. Grouping of the spots based on user and Grouping of users based on each spot are computed.

The distance between the user's current location and recommender locations are also taken into consideration. The unique item and spot combinations are selected and the each of unique user and spot intersected with the visit count of user for each spot. The co-occurrence matrix is built with need to computer the weighted average of the visit count in the place-user similarity model. The recommendations with highest weightage will be recommended through google maps. Since the location coordinates are given for each spot it is directed through the maps as diagrammatically shown in Fig1.4.

**V. RESULTS**

The suggestion or recommendations are provided through maps and place names. The Recommender Systems that are build for the popularity measures with evaluation parameters used to evaluate the model are precision and recall. The various other existing models are compared by computing the same parameters for same.



**Fig1.5 Precision and recall Measures**

**VI. CONCLUSION AND FUTURE WORK**

In this Paper a recommender system with two models are developed, one for a personalized location recommendation for the available user and other for cold start problem. The precision and recall evaluation parameters shows the comparative difference between the proposed model and the existing models. The Future work can be carried out providing a direction to the recommended places through google maps.

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