A Survey On Tourist Spots Mapping And Recommendation System

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Abstract— **Tourist Recommendation systems are used to provide personalized recommendations to tourists based on their preferences and interests. Being this popular, there is still not a large-scale environment available in the market. Our paper aims to provide a comprehensive overview of the tourist recommendation systems. The paper discusses the different techniques used in these systems, while reviewing the various datasets and evaluation metrics used in the development and evaluation of these systems. These systems use various techniques, including collaborative filtering, content-based filtering, hybrid filtering, and context-aware filtering, to recommend tourist sites, hotels, and restaurants to users. The evaluation metrics used includes precision, recall, RMSE, MAP values. The paper also explores the different applications of tourist recommendation systems, including their use in travel planning, tourist information centers, mobile applications, and chatbots. Overall, this survey paper provides a comprehensive overview of tourist recommendation systems and highlights the various techniques, applications, challenges, and future research directions in this field.**

Keywords— Filtering, Recommendation system, Tourist, Evaluation Metrics, Survey, Challenges.

I. INTRODUCTION

Tourism is one of the most important industries in the world, with millions of people travelling to different destinations every year. With the growth of the internet and mobile devices, tourists are increasingly relying on technology to plan and organize their trips. Tourist recommendation systems have emerged as a promising technology that can provide personalized recommendations to tourists based on their preferences and interests, making their travel experiences more enjoyable and memorable. The systems use different techniques and methods such as collaborative filtering, content-based filtering, and knowledge-based methods to generate recommendations.

In recent years, there has been a significant increase in the number of tourist recommendation systems developed, and several research studies have been conducted to investigate their effectiveness. This survey paper aims to provide an overview of the current state-of-the-art in tourist recommendation systems, including the different techniques and methods used, the challenges faced, and the evaluation methods used to measure their effectiveness.

There are various challenges that a tourist recommendation system faces such as data set collection, cold-start problem, etc. Cold-start problem is the situation where the system is unable to provide accurate recommendations for new users or new items with little or no historical data available. Another major challenge faced by the systems is user engagement, as the system without user participation and feedback will not be successful in providing accurate and relevant recommendations over time. The quality of the data used to train the recommendation algorithm and the privacy concerns related to the data are also faced by some systems[11]. The need for continuous updates to the system to ensure that the recommendations remain relevant and up-to-date as user preferences and tourism trends evolve over time is also an important challenge[12].

II. LITERATURE SURVEY

Ashkan Yeganeh Zaremarjal et al[1]. This uses Semantic Collaborative Filtering Recommender System Using CNNs. The proposed method consists of three main steps: data preprocessing, semantic feature extraction using CNNs, and recommendation generation. In the data preprocessing step, the authors transform the user-item interaction data into a matrix format suitable for collaborative filtering. In the semantic feature extraction step, the authors use a CNN to extract semantic features from the user-item interaction data. Finally, in the recommendation generation step, the authors use a collaborative filtering algorithm to generate personalized recommendations based on the user's preferences and the semantic features extracted from the CNN. The tested results of this method give a prediction accuracy for the public datasets of 83.22 Jester Dataset 3 and 84.56 for Jester Dataset

4. M Viswa Murali[2], this is a Collaborative filtering system that filters items based on users interests, that can be integrated with web sites based on applications like movies, music, books, etc. Since the amount of research papers published have been increasing rapidly, the need for optimized search and filtering engines has increased respectively. This paper proposes a recommender system that has three major factors such as datasets, predicting user rating and cosine similarity. Results are sorted by cosine similarity. This recommendation system uses matrix factorization technique that models user-item interaction and based on similarity of that data the system recommends new research papers. It also presents a metric called "trend index", that considers the originality and popularity of recommended research papers. M.Thenmozhi[3], The paper proposes a framework for a tourist recommendation system that utilizes geo-tagged photos to generate personalized recommendations for tourists. These geo-tagged photos are gathered from various social media websites such as Flickr, Twitter, Facebook where people share their experience and opinion. The proposed system uses a hybrid approach that combines content-based and collaborative filtering techniques to improve the accuracy and diversity of the recommendations. The paper presents the architecture and implementation of the proposed system, which uses geo-tagged photos to extract features and generate recommendations based on user preferences. The system also incorporates a feedback mechanism to continually improve the recommendations based on user interactions. The paper also discusses the evaluation of the proposed system using a real-world data set of geo-tagged photos and tourist preferences. The evaluation results show that the proposed system can generate personalized and diverse recommendations for tourists with high accuracy. Finally, the paper concludes by discussing the potential applications of the proposed system in the tourism industry and the future directions of research in this area. The proposed framework provides a useful approach to addressing the challenges of recommending tourist attractions and destinations based on user preferences and geo-tagged photos.

Author and year	Technology used	Dataset	Accuracy
Ashkan Yeganeh Zaremarjal, 2021	CNN	Jester Dataset 3, Jester Dataset 4	83.22 for Jester Dataset 3, 84.56 for Jester Dataset 4
M Viswa Murali, 2019	Root Mean Square Error (RMSE)	Research paper ratings	0.89 for RMSE, 0.79 for MSE
M.Thenmozhi, 2016	Hybrid filtering	Photos available in Flickr	0.8 precision, 0.72 Mean Average Precision

Fig. Summary Table

Morad Ali Hassan[4], the proposed algorithm addresses the limitations of traditional collaborative filtering techniques, such as the cold start problem and sparsity of the user-item rating matrix. The proposed algorithm incorporates a similarity measure that takes into account the context of the user-item interactions and improves the accuracy of the recommendations. The paper also introduces a new user-item weighting scheme that assigns weights to the user-item pairs based on the number of interactions and the recency of the interactions. The proposed framework is evaluated on a real-world dataset of movie ratings, and the results show that the proposed algorithm outperforms traditional collaborative filtering techniques in terms of recommendation accuracy and robustness to sparsity and cold start problems. Yingtong Dou[5], this paper first introduces the concept of social recommender systems, which use social network data to generate personalized recommendations for users. The paper then presents an overview of collaborative filtering algorithms, including user-based and item-based collaborative filtering, matrix factorization techniques, and hybrid approaches that combine multiple recommendation algorithms. The paper also discusses the limitations and challenges of collaborative filtering algorithms, such as sparsity and scalability issues. The paper then focuses on the use of social network data in collaborative filtering algorithms and discusses various techniques, such as social network analysis, social regularization, and social trust modeling. The paper also presents a case study of a social recommender system that uses a matrix factorization algorithm and social network data to generate personalized music recommendations. Finally, the paper concludes by discussing the future directions and challenges of social recommender systems and collaborative filtering algorithms, such as incorporating contextual information and addressing privacy concerns. YiBo Huang[6], the proposed algorithm first clusters similar items based on their feature similarities and then uses the cluster information to predict the ratings of the target items. The paper compares the proposed algorithm with traditional item-based collaborative filtering algorithms and shows that the proposed algorithm outperforms the traditional algorithms in terms of recommendation accuracy and scalability. The paper also presents a case study of a movie recommendation system that uses the proposed algorithm to generate personalized movie recommendations for users. The paper concludes by discussing the potential applications of the proposed algorithm in various domains, such as e-commerce, social media, and online advertising. The proposed algorithm provides a useful approach to addressing the scalability and accuracy challenges of item-based collaborative filtering algorithms. Xi Chen[7], this paper presents an intelligent system for recommending tourist routes based on Hadoop, a distributed computing platform. The system uses a collaborative filtering algorithm to generate personalized recommendations for tourists based on their travel preferences and historical data. The paper first introduces the concept of collaborative filtering and discusses the challenges of implementing collaborative filtering algorithms on large-scale data sets. The paper then presents the architecture and implementation of the proposed system, which uses Hadoop to process and analyze large amounts of tourist data. The paper also discusses the evaluation of the proposed system using a real-world data set of tourist preferences and historical travel data. The evaluation results show that the proposed system can generate personalized and accurate recommendations for tourists. Finally, the paper concludes by discussing the potential applications of the proposed system in the tourism industry and the future directions of research in this area. [8] discusses the development of a user-based tourist attraction recommender system, which generates a personalized list of attraction preferences for tourists. The system employs collaborative filtering and the cosine method to calculate similarities between users and generate recommendations based on the visiting history of the user's neighbors. The paper also highlights the increasing demand for personalized trips, making recommender systems attractive to business and academic researchers. It compares the collaborative filtering method with other approaches and reviews related works in the field of travel information recommendation. Overall, the paper describes the development process of the recommender system, emphasizing the importance of collaborative filtering in the tourism industry. [9] presents the design of an information system architecture for the recommendation of

tourist sites in the city of Manta, Ecuador, using a chatbot. The proposed system aims to provide personalized recommendations to tourists based on their interests, preferences, and location. It propose a system architecture that consists of a chatbot interface, a recommendation engine, a knowledge base, and a feedback loop to continuously improve the system's accuracy. The recommendation engine uses a combination of content-based filtering and collaborative filtering techniques to generate recommendations for tourists. The system also incorporates a geographic information system (GIS) to provide location-based recommendations. The authors report the results of a pilot study that evaluated the system's performance in generating recommendations for tourists in the city of Manta. Overall, the paper provides a promising approach to designing an information system architecture for tourist recommendations using a chatbot. [10] proposes an intelligent search system for e-tourism services that uses a recommendation system to provide personalized recommendations to tourists. The system uses a hybrid approach that combines collaborative filtering and content-based filtering techniques to generate recommendations. The system uses a database of tourist profiles and historical data on tourist preferences and behavior to generate recommendations. The authors explain how the system uses machine learning algorithms to continuously improve the accuracy of its recommendations. Overall, the paper presents an innovative approach to intelligent search in e-tourism services, and the hybrid recommendation system proposed by the authors has the potential to provide accurate and personalized recommendations to tourists. [11] presents a worldwide tourism recommendation system based on geotagged web photos. The proposed system aims to recommend tourist attractions based on user-generated photos from social media platforms, such as Flickr and Instagram, that are tagged with geographical locations. They develop a recommendation algorithm that uses a combination of content-based filtering, collaborative filtering, and social network analysis techniques to generate personalized recommendations for tourists. The recommendation algorithm analyzes user-generated photos to identify common patterns and characteristics of tourist attractions, such as landmarks, landscapes, and historical sites. The system also incorporates social network analysis to identify influential users and their preferences. Overall, the paper provides a promising approach to developing a worldwide tourism recommendation system based on geotagged web photos. [12] presents a system that uses user-generated data from social media platforms to provide personalized and contextualized recommendations to tourists. The dataset used in the study includes over 5,000 photos and reviews from tourists who have visited Japan. The authors used data mining and machine learning techniques to extract relevant features from the data, such as location, attraction category, and user sentiment, to generate personalized recommendations for each user. The quality and quantity of the data, the need for continuous updates to the system, and the need to balance between providing personalized recommendations and preserving user privacy are some ogf the challenges faced by the system. Overall, the paper presents an innovative approach to tourism recommendation using user-generated data and machine learning techniques. [13] describes the design and implementation of an intelligent recommendation system for tourist attractions. The system is based on a collaborative filtering algorithm and uses data from user reviews on popular travel websites to generate personalized recommendations for tourists. Although a specific accuracy metric for the system is not mentioned, the results of a user study are usedto evaluate the effectiveness of this system. The study found that the system was able to generate relevant recommendations for users, with an average accuracy rate of 72.86%. The authors note that the system was particularly effective in recommending less well-known attractions and that users

were generally satisfied with the recommendations provided. [14] discusses the development of a recommendation system for popular tourist attractions in Taiwan. The system combines the Delphi panel and repertory grid techniques to generate recommendations based on the preferences of users. The Delphi panel method was used to identify important criteria for tourist attraction selection, while the repertory grid technique was used to generate a personalized recommendation list for each user. The system was evaluated using data from a survey of 502 tourists. The paper reports that the Delphi panel and repertory grid techniques were effective in identifying key factors that influence tourists' attraction choices and that the recommendations generated by the system were generally well-received by the study participants.

III. CONCLUSION

This paper presents a detailed analysis of various recommendation filtering methods used to recommend items to users based on the type of filtering method used in the recommendation system. The various studies were analysed on several factors which include the dataset used, evaluation metrics and the different state-of-the-art techniques which were employed and a comprehensive guide was prepared for the same.

Based on the study, the most popular and precise filtering method is proved to be collaborative filtering. Low availability of datasets containing similar parameters to the requirements lead to one of the major challenges that was obtaining the dataset. Also, one of the challenges faced during studies was the cold-start problem.

There is no specific evaluation metric for evaluation of recommendation systems. Most of the studies prepared their datasets by obtaining the data available on the internet.

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