Trends and Techniques used in Tourist Recommender System : A Review

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ABSTRACT

Traveling to other locations for pleasure, business, or other reasons is called tourism. In every sort of recommender system, there are a certain amount of users and items. Creating a recommendation systems is made more difficult by the abundance of information available online and the high volume of website visits. A recommender system pulls the user's preferences or interests from relevant data sets to reduce information overload. This calls for the development of a new recommended system that will deliver higher-quality recommendations for massive data sets. To solve these kinds of problems, we have found several approaches for making recommendations, including three different types: content-based filtering, collaborative filtering, and hybrid filtering. With each type of recommender system, this research also analyses several algorithms. The main aim of this paper is to review several trends and techniques currently being used in tourist recommender systems.

Keywords :- Collaborative Filtering, Content- Based Filtering, Hybrid Filtering, Tourism And A Recommendation System.

I. INTRODUCTION

Tourist recommender systems are designed to help travelers discover destinations, attractions, restaurants, and accommodations that match their preferences. There are several approaches to building such systems using artificial intelligence (AI) techniques. Some of the commonly used AI- based approaches for tourist recommender systems include:

Collaborative Filtering: This approach is based on the assumption that users who have similar preferences for tourist attractions are likely to have similar preferences for other attractions. This approach involves analyzing user behavior and preferences to recommend places of interest.

Content-based Filtering: This approach focuses on the characteristics of the tourist attractions themselves, rather than the behavior of users. It involves analyzing

the features of the attractions and recommending similar attractions based on those features.

Hybrid Approaches: These approaches combine collaborative filtering and content-based filtering to take advantage of the strengths of both methods. By combining the two approaches, hybrid systems can provide more precise and personalized recommendations.

Knowledge-based Systems: These systems use domain-specific knowledge and expert systems to provide personalized recommendations. For example, a system might use knowledge about a user's travel history, preferences, and demographics to recommend suitable tourist attractions.

Reinforcement Learning: This approach uses feedback from users to learn and improve recommendations over time. The system observes how users interact with recommendations and adjusts its recommendations accordingly.

Overall, the choice of AI-based approach for a tourist recommender system depends on factors such as the availability of data, the complexity of the problem, and the desired level of personalization. n AI-based approach for a tourist recommender system can involve several steps:

Data Collection: The system should collect data about tourist attractions, user preferences, and other relevant information. This data can be obtained from numerous sources such as user reviews, social media, and tourism databases.

Preprocessing: The collected data should be cleaned, filtered, and transformed into a suitable format for analysis. This may involve tasks such as removing duplicates, resolving missing values, and converting text data into a numerical format.

Feature Extraction: Characteristics like location, type of attraction, and popularity can be extracted from the preprocessed data. These features can be used to represent tourist attractions and users in a numerical format.

Model Selection: The system should select an appropriate AI-based model for making recommendations. Popular models include collaborative filtering, content-based filtering, hybrid approaches, knowledge-based systems, and reinforcement learning.

Training: The selected model should be trained on the preprocessed data to learn patterns and relationships between users and tourist attractions. The training process involves adjusting the model's parameters to minimize the error between the predicted and actual values.

Evaluation: The system should evaluate the performance of the trained model using metrics such as accuracy, precision, and recall. This helps to determine the effectiveness of the system in making accurate recommendations.

Deployment: Once the model is trained and evaluated, it can be deployed in a production environment where users can interact with it and receive personalized recommendations.

Overall, an effective AI-based approach for a tourist recommendation system should be able to handle large amounts of data, provide accurate and personalized recommendations, and adapt to changing user preferences over time.

II. COMPARATIVE STUDY

S.no.	Year	Author	Title	Keywords	Technique(s) Used	Findings
1	2021	Khali dAL Fararni	Tourism Recommendati on System based on Big Data and AI	e-tourism, recommende rsystems, content-based filtering, collaborative filtering, hybrid recommende rsystem	classification, clustering, association rules, regression, collaborative filtering, and recurrent neural networks	Different approaches to recommender systems, including collaborative filtering and social recommender systems. Contextual information is important for recommender systems
2	2020	Ling Liu	Recommendati on System for Tourist Attractions based on Data Mining	recommendat ion system, tourist attractions, data mining	knowledge graph, scoring mechanism, and path planning algorithm	The proposed model is efficient and provides accurate recommendatio n
3	2017	Hela Masri	personalized tourism system	Hybrid recommende rsystem, Collaborativ e ,Content based, Demographi c ,weighted and switching hybridizatio n	Technique of data mining, user ratings, predict user preferences, fuzzy logic, classification based on association	Classification based on association methods canbe employed for personalization in recommender systems.
4	2019	Maddal a Lakshm iBai	Hybrid Filtering usingTourist Recommender System	Personalized recommenda tion,cold-start, Tourism, Hybrid filtering. July 2016 | July-A	content based filtering, collaborative filtering, and demographic information to address the 'cold start' problem	predict the ratings for thenew user, results are relatively acceptable and work effectively and efficiently to solve the cold-start problem.
SEIT X	XX | Recei	ved: XX July	2016 | Accepted: XX			
		Zheng	on System based on Knowledge Graph for tourism	system, Recommenda tion system, knowledge graph, feature extraction	analytic framework, to construct the novel scenario	recommendation system is data collection, including user information, integrated user interaction records, tourist attraction

						information, and also contextual information.
6	2021	Lu Peng	Spark-based Recommendation System	Recommendation System , Spark Platform ,Collaborative Filtering	Spark parallelized computing , memory iteration operation , user similarity , geographical location	Spark-based distance weighted recommended system is 2.45 times faster than traditional recommended system running under Map Reduce, accuracy of the recommended system is significantly improved.
7	2019	Rashmi A. Wahurwag	Personalized POI Recommendation with Tourist Information	POI(point of interest), popularity, prediction	POI based location recommendation system ,multidimensional preference collection system , POIs extraction , emotion extraction algorithm.	compare the layers given in some paper to find out POIs of the user
8	2017	Huihui Hu	Slope One Algorithm used for Recommendation of Tourist Attractions	Slope One algorithm, Item-based collaborative filtering ,tourist attractions recommendation	Slope One Algorithm	Slope One algorithm weakens the effect of popular tourist attractions on prediction ratings.
9	2017	Bansari Patel	A review on Recommender Systems	Collaborative filtering, Content-based filtering, Hybrid filtering, Recommender system	Recommender Techniques	To improve the recommendation performance, accuracy, efficiency.
10	2018	Mohamed Hussein Abdi1	Matrix Factorization Techniques for Recommender Systems	matrix factorization, collaborative filtering, accuracy of predictions, quality of recommendations	The Neighborhood based technique , the Matrix Factorization technique, Context information, Tensor Factorization	The techniques provide more accurate predictions and relevant recommendations
11	2019	M Viswa Murali	Recommender System based on Collaborative Filtering for analyzing New	Recommender systems, Collaborative filtering, Data mining	recommender system, suggest papers to users, which includes ratings by users and cosine similarity	recommender system proposed, 3 major factors used for building the system datasets, prediction rating based on users and cosine similarity

			trends			
12	2017	Jyotirmoy Gope	cold start problem solution in recommender systems	Cold Start Problem, Recommender systems, Active Learning, Decision Trees	explicit solutions, implicit solutions	approaches differ in the way they collect missing information.
13	2017	Haymonte e Khan	Fuzzy Inference-Based Tourist Spot Recommendation System	Recommendation System, Tourist Spot Searching, Fuzzy Logic, Fuzzy Inference	fuzzy logic , Fuzzy Inference System (FIS) , tourist spots	recommend tourist spots to travelers based on their desired location types, budget, number of people going on the trip, and other defined parameters
14	2020	Yudai KATO	Considering Users' Visit frequency for Tourist Attractions	Recommendation Systems, Visit frequency, Sightseeing spot recommendation system, WebGIS, SNS	knowledge based recommendation, collaborative recommendation methods	the system was useful and effectivein recommending sightseeing spots
15	2020	Zhizhou Duan	route recommendation based on users current interest	Tour recommendation, User interests, Personalization, CNN, Social network	convolutional neural network, optimization algorithm	The proposed algorithm is effective

Table: Comparative Study of previous research

III. FINDING AND DISCUSSION

As discussed and reviewed the major goal of the tourist recommendation system is to reduce the issue of cold start and, to a certain extent, increase the forecast accuracy of the recommendation algorithm, according to our discussion and review of all trends and methodologies. Many techniques have been investigated, and the findings are as follows:

- Collaborative filtering is one of the widely used techniques in recommendation Systems. The major element that impacts how accurately collaborative filtering can predict outcomes is data sparsity. Collaborative filtering system also suffers from the 'new user' problem. The addition of a new rating need to immediately modify all predictions.
- Also, the paper discusses the data collection process for a tourism recommendation system, including user information,
- The proposed TRS is hybrid since it integrates the three recommender methods (CF, CB, and DF) using two hybridization procedures, the weighted

and switching approaches. The proposed approach benefits from the advantages of each recommender method and overcomes its drawbacks.

- Design and implementation of a real-time trip suggestion system that satisfies various requirements and doesn't need prior information.

IV. CONCLUSION AND FUTURE WORK

In this paper, a literature review of different methods of recommender systems has been made. The collaborative filtering algorithm has more advantages over other recommender system techniques, it has been seen and inferred from the review of various methods. These many algorithms each have advantages and disadvantages of their own. Since user-based algorithms are not scalable, they are more accurate than item-based algorithms. Finding ways to increase suggestion performance, accuracy, and efficiency is the major goal of surveys on various recommender systems. Several hybrid approaches are employed to raise the standard of recommender systems, but they have significant drawbacks. Their implementation is more difficult and costly.

The paper mentions a project which aims to use big data and AI to provide intelligent tools to target and recommend the most suitable tourist offer, track and analyze opinions and forecast tourist demand.

As part of the future work, the proposed approach of a decision tree-based recommendation system is applied. A decision tree-based travel recommendation system has a lot of potential for giving users personalized and appropriate recommendations. You can increase the precision and efficiency of the system by adding more data sources, enhancing the decision tree, including user feedback, introducing context awareness, and experimenting with other algorithms.

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