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Context Attentive Recommender System: A Survey

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Abstract: Recommendation is a process of suggesting something to someone. Since there is lot of information available around us, users find it difficult to find proper information. In order to solve this problem recommendation systems were being built that allow users to reach necessary information without wasting much time. The recommendation system is a weapon that help users in finding the approp riate service within no time. Most of the traditional recommendation system were being developed using content based filtering and collaborative filtering which works only on user and item profile. Many research were done where it found that beyond user and item profile, incorporating contextual information will enhance the prediction task and providing the more accurate recommendations. This paper surveyed the background, contextual information used in context based destination recommender system for tourism and types of algorithms.

Keywords: Contextual information, Recommender System, Context aware recommender system, Contextual postfiltering, contextual prefiltering, contextual modelling

I. INTRODUCTION

The exponential growth of the internet usage by the users has greatly changed the social behaviour in many fields. The immense increase in the amount of digital data generated by electronic devices made it harder for users to find the interesting data within a reasonable time over the web. In order to solve this issue Recommender systems are developed to provide relevant information to the users within no time. Considering the tourism system, the web provides lot of information to the users about the destination places. Such excessive amount of information regarding destinations may make users to take incorrect decisions. User finds it very much difficult to get the most relevant destination places from such a huge amount of digital information. Tourism recommender system plays an important role in providing the relevant information to the users. Most of the recommender -system generates the rating information, by considering only user profile (U) and destination profile (D), which is given by (UDR) . They completely ignore the contextual information, which may give rise to generation weak ratings function that leads to weak recommendations. Building the recommender system using contextual information (C) with user and destination profile which is given by (UDCR) provide most relevant data to user.Contextual information adds more accuracy to the recommendation engine, as it provides the situation of a user under which the user would like to travel a particular destination. many research have been conducted with different approach and techniques in context aware recommendation for tourist. Some techniques have been discussed further in this paper.

II. LITERATURE SURVEY

A. Data Collection

Data collection is the most important part of a context based destination recommender system for tourist. It has two parts, first one is collecting information about the user-destination i.e. collecting the data about users interest for specific destination. The user interest is for a specific destination is shown through the ratings provided by the user for that destination. the second on is collecting the information about the context i.e. collecting the situational information of user while expressing his/her interest.

B. Context

Context is a situational information which characterizes particular event. It is a circumstances that form the setting for an event. The incorporation of contextual information in destination recommender system for tourist helps in enhancing the quality of recommendation. Context is a environmental situation under which event happens. The context information changes over time.

C. Context Information

Context information is the situational data that is being used in context based recommender system. Many contextual information have been proposed depending on domain for which recommender system is built on. While considering the tourism domain the most familiar and most widely used contextual information is Location. This contextual data explains the current position of a tourist [2][4][6][7][8][9][10]. Next contextual information is Time. Time describes the current time at the tourist end. Time can be characterized in weekday and weekend or Morning, afternoon and evening[2][4]. Depending on current time information

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appropriate destinations are recommended. Weather as a contextual information also plays an important role in scrapping the appropriate the destination. The weather may be characterized as sunny, rainy and winter [3]. Other contextual information is user preference where user has to manually enter his/her preference [2][6][10]. Season is another contextual information which is classified into rainy, summer and winter[5].

D. Context Acquisition

In context based destination recommender system for tourism, the relevant contextual data is collected to generate context dependent tourist profile for prediction purpose. Context based tourist profiling is new way for tourist profiling which is proposed in [3], which addresses the limitations of traditional recommender system which used to focus only on tourist and destination and misses contextual data. context based rating generation technique is considered as multidimensional approach which accommodates tourist profile, destination profile and corresponding context information to generate the rating for tourist-destination. Actually the rating function is represented by R : Tourist Destination Context rating where R represents the rating function.

Explicit

The explicit way involves collecting the contextual information by directly asking the tourist to specify their interest. The system is dependent on user for their manual input. One way of acquiring the information is by directly asking the question to the user or let them fill the form.

Implicit

The implicit way involves collecting of contextual information by observing the user and sensing the user environment automatically. Location, time, weather, etc. are collected automatically using the smart devices that tourist has. In this approach there is no involvement of tourist with system for providing the data. system collects the tourist current location based on GPS that every mobile device has. Even time and weather information is collected from mobile devices.

Inferred

The inferring procedure involves collecting of information by simply tracking the tourist interaction with devices and resources and acquiring context by using statistical or data mining techniques.

E. Rating Model

Gediminas et.al. in [3] proposed two forms of model for generating rating model in context based recommender such as hierarchical structure or multi-dimensional model. In hierarchical structure the contextual information is arranged in hierarchical way, such as tree, to build the model. Such tree representation defines as a set of contextual dimensions, each having a set of attributes in which each attributes in the set has a hierarchical structure having a particular type of context. Ontology[1][5][10] and Context dimension tree[8] are the methods being used in hierarchical structure.

Gediminas et al. in [3] proposed second way to generate the rating model is by defining the context data as multidimensional model. This dimensions are defined in such a way that first two dimensions are tourist and destination and rest dimensions are the contextual data in which each dimension is a subset of a Cartesian product of some attributes (fields) having a single or domain of values. If suppose model assumes be n dimensions since the model take dimensions as a Cartesian product the rating function R : Tourist Destination Context rating can be defined with this dimensions as R: .

F. Recommendation

Recommendation is a list of top N destinations that user might be interested to visit. This recommendations are taken out based on the prediction score which is actually the rating, the one with high prediction score will be to in list. Recommendation is a shortlisted destinations from predictions based on contextual information.

G. Contextual Paradigm

Context based recommender system are modelled with a data records which are of the form Tourist Destination Context rating where each and every record specifies how much particular destination is liked by a tourist in specific context. Three types of contextual paradigm are identifies in [3] namely, contextual postfiltering, contextual prefiltering and contextual modelling.

Contextual postfiltering procedure ignores the contextual information at initial phase and use one of the two dimensional model for generating the rating on the whole data set. The contextual information is considered as a part of destination and not as separate entity. Contextual prefiltering technique uses current contextual information of tourist to filter out the records from dataset that

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pertaining to that contextual information. One of the two dimensional model is used over the filtered data set to generate the rating model.

The contextual modelling approach is a third type of algorithm that directly utilizes the contextual information to predict the rating for an item by formulating a multidimensional recommendation functions. This function represents predictive models that are built using probabilistic models, decision trees, regression or heuristic-based calculations by using the rating as well as the contextual information.

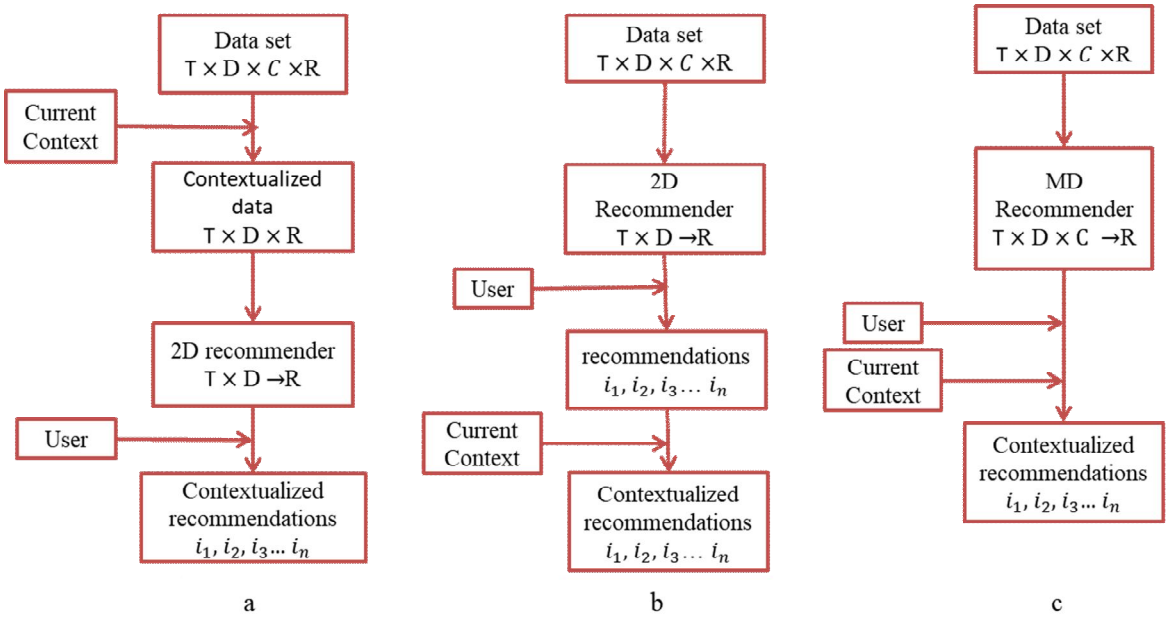


Fig 1. a. Contextual Prefiltering b. Contextual Postfiltering c. Contextual Modelling

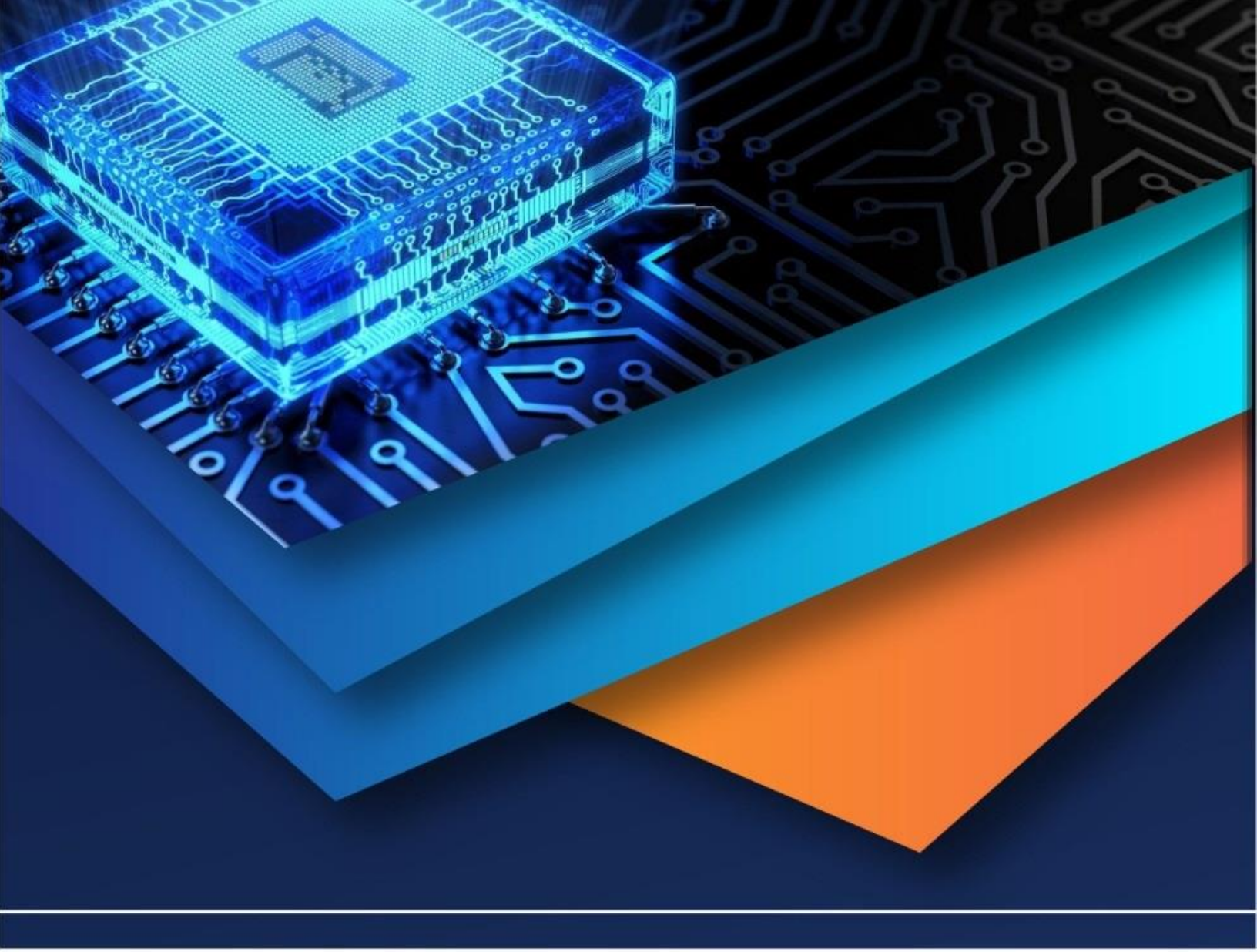
III.CONCLUSION

This article discuss the approaches that are being used destination recommender system for tourism along with the context that have been used in the system. It also brings the general techniques for acquiring contextual information. It explains the two rating generation model such as hierarchical structure and multidimensional models that can be used to build recommendation system.

REFERENCES

[1] Ago Luberg, Karin Schoefegger, Priit Järv, Tanel Tammet, “Context-aware and Multilingual Information Extraction for a Tourist Recommender System” .
[2] Kevin Meehan, Tom Lunney, Kevin Curran, Aiden McCaughey, "Context-Aware Intelligent Recommendation System for Tourism", IEEE 2013
[3] Gediminas Adomavicius and Alexander Tuzhilin, "Context-Aware Recommender Systems", Springer Science+Business Media New York 2015.
[4] Jose L. Jorro-Aragoneses and Susana Bautista-Blasco, "Adaptation Process in Context-Aware Recommender System of Accessible Tourism Plan", Springer Nature Switzerland AG 2018.
[5] Chakkrit Snae Namahoot, Michael Brückner, Naruepon Panawong, "Context-Aware Tourism Recommender System Using Temporal Ontology and Naïve Bayes", Springer International Publishing Switzerland 2015
[6] Christopher Laß, Daniel Herzog, Wolfgang Wörndl, "Context-Aware Tourist Trip Recommendations", RecTour 2017
[7] Chien-Chih Yu and Hsiao-ping Chang, "Towards Context-Aware Recommendation for Personalized Mobile Travel Planning", ICCASA 2012, LNICST 109, pp. 121–130, 2013
[8] Mario Casillo, Luca Cerullo, Francesco Colace, "An Adaptive Context Aware App for the Tourism", ACM 2016.
[9] Chien-Chih Yu and Hsiao-ping Chang, "Personalized Location-Based Recommendation Services for Tour Planning in Mobile Tourism Applications", Springer-Verlag Berlin Heidelberg 2009
[10] Alexander Smirnov, Alexey Kashevnik, Andrew Ponomarev, Nikolay Shilov, Nikolay Teslya, "Proactive Recommendation System for m-Tourism Application" pp. 113–127, Springer 2014.

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