Chapter 2

A Survey on Building Recommendation Systems Using Data Mining Techniques

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ABSTRACT

Classification is a data mining technique or approach used to estimate the grouped membership of items on a basis of a common feature. This technique is virtuous for future planning and discovering new knowledge about a specific dataset. An in-depth study of previous pieces of literature implementing data mining techniques in the design of recommender systems was performed. This chapter provides a broad study of the way of designing recommender systems using various data mining classification techniques of machine learning and also exploiting their methodological decisions in four aspects, the recommendation approaches, data mining techniques, recommendation types, and performance measures. This study focused on some selected classification methods and can be so supportive for both the researchers and the students in the field of computer science and machine learning in strengthening their knowledge about the machine learning hypothesis and data mining.

INTRODUCTION

In today's era of the internet and fast-growing web social media technologies, many web retail businesses like Amazon, and eBay, social media network programs like Facebook, Twitter, LinkedIn, and YouTube, entertainment web platforms like Netflix, Pandora, and Waze that defines the best route have evolved (Briciu & Briciu, 2021). This has also massively increased the amount of information online (Mahadik et al., 2020). Due to this factor, individuals find a challenging time to skim the information about the desired products in a short period. To cater to this challenge, Recommender systems were developed and implemented into most e-commerce websites to efficiently tailor products and services to customers (Ahmadian et al., 2020; Chehal et al., 2020). Additionally, the massively increased amount of information online factor has made RSs so tremendous in today's world and our daily lives. Regularly more and more RSs evolve basing on the textual review, comparative opinion, user ratings, purchase patterns, user profiles, among others (Gupta & Dave, 2020).

A Recommender System is a program that filters information based on user preferences, interests, likes, dislikes, and ratings of the preferred item, builds a user profile, and then predicts whether the user will prefer the item or not (Anandhan et al., 2018; Jannach et al., 2020). Commonly, there are four approaches available for generating personalized recommendation systems, they include content-based (CB) filtering, collaborative (CF) filtering, knowledge-based (KB) filtering, and hybrid-based (HB) filtering (Hernández-Nieves et al., 2020). Under the CB filtering approach, the recommendation of items is based on content similarities such as the features and preferences, for example, a movie recommender system on NetFlix recommending other movies with the same actor(s) to a user (Shu et al., 2018; Wu et al., 2018). CF filtering approach is the most prominent approach used on the web (Schafer et al., 2007). It uses the known likings of a group of users to make recommendations or predictions of the unknown likings for other users (Su & Khoshgoftaar, 2009). HB approach combines CB and CF approaches and solves almost all the problems encountered in the two methods (Barros et al., 2020). Like all other recommender system approaches, the KB approach doesn't base on the rating of other user ratings (Burke & systems, 2000). Its judgments are independent of individual tastes. The most common kind of recommendation system is a web application with which a user interacts with. This web application presents to a user a list of items from which a user selects an item to receive more details about that.

For example, from a catalog of many items or products in the database that wouldn't seemingly fit into a webpage, it is necessary to select a subset of items from the database to display to the user. E-commerce website applications display a page containing a list of products, then the user can select a product to see more details about the product if possible proceeds to purchase the product.

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