

Research on Personalized Recommendation System Based on Big Data

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Abstract

This template explains and demonstrates how to prepare your camera-ready paper for Trans Tech Publications. The best is to read these instructions and follow the outline of this teWith the development of the Internet era and the advent of the era of big data, people have gradually entered an era of information overload from the era of lack of information. In order to allow users to efficiently obtain the information they need from the massive amount of information, a recommendation system came into being. The recommendation system based on big data understands the user's preferences by analyzing the user's historical records, so as to actively recommend the information of interest to the user to meet the user's personalized recommendation needs.

Keywords

Big data; Data mining; Personalized recommendation.

1. Overview of the recommendation system

A recommendation system is a tool that automatically contacts users and items [1]. It conducts personalized recommendations by studying users' interests and hobbies. The recommendation system is to model the user's interest by analyzing the user's historical behavior, so as to actively recommend the user information that can meet their interests and needs. The recommendation information that each user gets is related to his behavioral characteristics and interests, rather than generalized information [2].

The recommendation engine may use different parts of the data source according to different recommendation mechanisms, and then based on these data, analyze certain rules or directly predict and calculate the user's preferences for other items. In this way, the recommendation engine can recommend items that may be of interest to the user when he enters.

2. Recommendation Mechanism

2.1. Recommendations based on Demographics

The demographic-based recommendation mechanism can discover the user's relevance based on the user's basic information, and then recommend other items that similar users like to the current user. Calculate the similarity of users based on the user's age and gender information, you can see similar user groups, and recommend the same preferences to the current user.

The main advantage of the demographic-based recommendation mechanism is that there is no "cold start" problem for new users, and it is domain-independent and does not depend on the data of the item itself, so it can be used in different item fields. The disadvantage is that the classification method based on user information is too rough, especially in areas that require higher taste, such as books, movies, and music, and cannot get a good recommendation effect[3].

2.2. Content-based Recommendation

Content-based recommendation is the most widely used recommendation mechanism at the beginning of the advent of recommendation engines. Its core idea is to discover the relevance

of items or content based on the metadata of the recommended items or content, and then recommend to users based on the user's past preference records User similar items.

The content-based recommendation mechanism can provide more accurate recommendations. However, the quality of its recommendations depends on the completeness and comprehensiveness of the item model, and recommendations are made based on the user's past history, so there is a "cold start" problem for new users. The content-based recommendation mechanism is mostly applied to some social sites of movies, music, and books.

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3. Application of Recommendation System

At present, recommendation systems play an important role in various websites and applications such as e-commerce, social networks, online music, and online videos. The following will briefly analyze Amazon.

Amazon, as the originator of the recommendation system, has penetrated the idea of recommendation in every corner of the application. The core of Amazon recommendation is to predict products that users may be interested in through data mining algorithms and the comparison of consumer preferences between users and other users. Amazon uses a partitioned hybrid mechanism, that is, different recommendation results are displayed to users in different areas. Figure 1 shows the recommendations that users can get on the Amazon homepage.

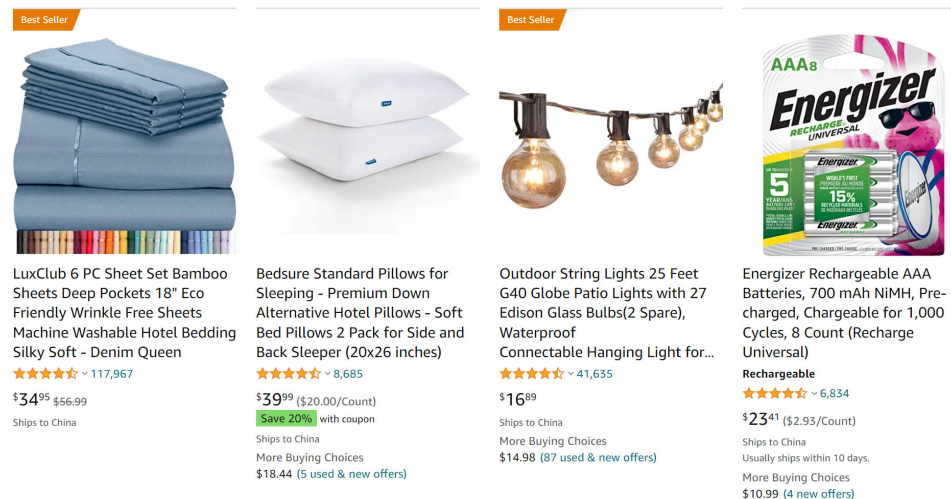


Figure 1. Amazon recommendation mechanism: Homepage

Amazon makes use of all user behaviors that can be recorded on the site, and processes them according to the characteristics of different data, thereby dividing them into different areas to push recommendations for users.

Guess you like it: usually a recommendation is given based on the user's recent purchase history or viewing history.

Hot-selling products: A content-based recommendation mechanism is adopted to recommend some hot-selling products to users.

Figure 2 shows the recommendations that users can get on Amazon's browse item page.

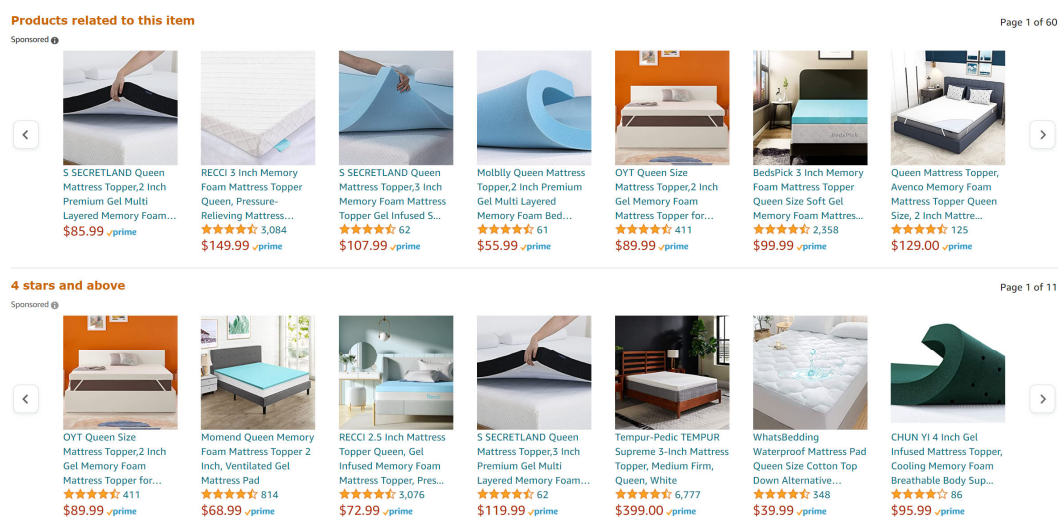


Figure 2. Amazon recommendation mechanism: browse items

When users browse items, Amazon will process all users' behaviors on the site according to the items currently browsed, and then push recommendations for users in different areas.

Commodities that are often purchased together: Use data mining technology to analyze the purchase behavior of users, find a collection of items that are often purchased together or by the same person, and then bundle them. This is a typical item-based collaborative filtering recommendation mechanism;

Customers who bought this product also bought it at the same time: This is also a typical item-based collaborative filtering recommendation application, and users can find the items they are interested in faster and more conveniently.

4. Conclusion

The recommendation system based on big data understands users' preferences through different recommendation mechanisms, so as to actively recommend users the information they are interested in, meet the user's personalized recommendation needs, and enable users to efficiently obtain what they need from massive information information.

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