Typicality-Based Collaborative Filtering Recommendation

ABSTRACT:

Collaborative filtering (CF) is an important and popular technology for recommender systems. However, current CF methods suffer from such problems as data sparsity, recommendation inaccuracy, and big-error in predictions. In this paper, we borrow ideas of object typicality from cognitive psychology and propose a novel typicality-based collaborative filtering recommendation method named TyCo. A distinct feature of typicality-based CF is that it finds “neighbors” of users based on user typicality degrees in user groups (instead of the co-rated items of users, or common users of items, as in traditional CF). To the best of our knowledge, there has been no prior work on investigating CF recommendation by combining object typicality. TyCo outperforms many CF recommendation methods on recommendation accuracy (in terms of MAE) with an improvement of at least 6.35 percent in MovieLens data set, especially with sparse training data (9.89 percent improvement on MAE) and has lower time cost than other CF methods. Further, it can obtain more accurate predictions with less number of big-error predictions.
EXISTING SYSTEM:

Collaborative filtering (CF) is an important and popular technology for recommender systems. There has been a lot of work done both in industry and academia. These methods are classified into user-based CF and item-based CF. The basic idea of user-based CF approach is to find out a set of users who have similar favor patterns to a given user (i.e., “neighbors” of the user) and recommend to the user those items that other users in the same set like, while the item-based CF approach aims to provide a user with the recommendation on an item based on the other items with high correlations (i.e., “neighbors” of the item). In all collaborative filtering methods, it is a significant step to find users’ (or items’) neighbors, that is, a set of similar users (or items). Currently, almost all CF methods measure users’ similarity (or items’ similarity) based on corated items of users (or common users of items). Although these recommendation methods are widely used in E-Commerce.

DISADVANTAGES OF EXISTING SYSTEM:

1. It is difficult to find out correlations between users and items.

2. It occurs when the available data are insufficient for identifying similar users or items.

3. Recommendation accuracy is not efficient.
PROPOSED SYSTEM:

In this paper, we borrow the idea of object typicality from cognitive psychology and propose a typicality-based CF recommendation approach named TyCo. The mechanism of typicality-based CF recommendation is as follows: First, we cluster all items into several item groups. For example, we can cluster all movies into “war movies,” “romance movies,” and so on. Second, we form a user group corresponding to each item group (i.e., a set of users who like items of a particular item group), with all users having different typicality degrees in each of the user groups. Third, we build a user-typicality matrix and measure users’ similarities based on users’ typicality degrees in all user groups so as to select a set of “neighbors” of each user. Then, we predict the unknown rating of a user on an item based on the ratings of the “neighbors” of that user on the item.

ADVANTAGES OF PROPOSED SYSTEM:

1. It improves the accuracy of predictions when compared with previous recommendation methods.
2. It can reduce the number of big-error predictions.
3. It works well even with sparse training data sets.
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SYSTEM ARCHITECTURE:

HARDWARE REQUIREMENTS:

- System : Pentium IV 2.4 GHz.
- Hard Disk : 40 GB.
- Floppy Drive : 1.44 Mb.
- Monitor : 15 VGA Colour.
- Mouse : Logitech.
- Ram : 512 Mb.
SOFTWARE REQUIREMENTS:

- Operating system: Windows XP/7.
- Coding Language: ASP.net, C#.net
- Tool: Visual Studio 2010
- Database: SQL SERVER 2008