

An implicit rating based recommendation system considering time information

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ABSTRACT

With the rapid growth of technology and web, there is so much information available in Internet. Recommendation systems are powerful tools to provide users a fast way to find their needs. In addition, recommendation systems also enable sellers provide buyers with the items they are likely to purchase. In collaborative filtering recommendation systems, user's rating is required to generate recommend items. However, user's rating is not always available in several applications. To solve this problem, a novel recommendation system that can generate implicit ratings from temporal transaction data is proposed. This recommendation system considered time information of user's transaction to establishing user's implicit ratings. Thus, item rating for a user is generated based on user purchased time and time-interval between purchased items. Moreover, closeness preference is evaluated and considered since the items with close association should have more chance to be selected and suggested. To deal with dynamic and huge amount of data, the incremental singular value decomposition (incremental SVD) algorithm is applied to predict unknown ratings. With incremental SVD algorithm, the system doesn't need to repeatedly evaluate rating matrix using singular value decomposition (SVD) algorithm when every time the target user added. To let the prediction more accuracy, calculated modified rating with closeness preference. Finally, the item with highest modified rating will be recommended to the user. Through the experiment, the performance of the system using closeness preference to recommend items is better than that without using closeness preference. To get better prediction accuracy, the parameter of closeness preference should be set based on cluster data. It also shows that the different number of clusters and different number of recommendation items will affect the prediction accuracy.

Keyword: recommendation systems 、 implicit rating 、 item association 、 incremental SVD 、 time information