Abstract

The sparsity problem is considered as one of the main issues facing the collaborative filtering. This paper presents a new dimensionality reduction mechanism that is applicable to collaborative filtering. The proposed mechanism is a statistical-based method that exploits the user-item rating matrix and item-feature matrix to build the User Interest Print (UIP) matrix. The UIP is a dense matrix stores data that reflects the satisfaction degree of the users about the item's semantic feature. This method is developed based on the assumption that people tend to buy items related to what they have previously bought. Also, this method benefited from the fact that the number of features is much less than the number of items and mostly constant. The effectiveness of the proposed mechanism is tested on two real datasets namely Movielens and HetRec 2011. The obtained accuracy results using UIP matrix are compared with the one obtained using the user-item rating matrix. The experimental studies demonstrate the superiority of our proposed method. On average, using UIP matrix the collaborative filtering achieved 8% improvement in terms of prediction accuracy.