**Abstract**

Nowadays Collaborative Filtering (CF) is a generally accepted recommendation and prediction algorithm based on other related attributes in which users can express their opinions on their products by rating them. CF algorithm is used to collect the existing user ratings and to predict ratings on unknown items for an individual user, and recommends to the users the items which are maximum predicted ratings.

Multidirectional similarity learning is proposed Collaborative Filtering method in that, Principle Component Analysis is used to predict asymmetric rating prediction for multiple attributes similarity. Feature Reduction is applied to reduce the feature size after feature selection Process and it can be implemented using Singular Value Decomposition. After the product resemblance relation is learned, it will be used flexibly in several ways for rating prediction. On the other hand, similarities between multiple attributes in reality are inter-dependent and it is used to reinforce each other. Hence, this similarity model is more appropriate if the similarities between users and items are jointly learned. Finally, Multiple Criteria Decision Analysis (MCDA) supports to decision makers to make an optimal selection in the environment of conflicting and competing criteria are proposed. In this paper proposes a new mechanism for integrating MCDA into CF process in multiple criteria recommendations. The proposed system consists of two main parts. Firstly, the weight of each user towards each feature is computed by using multiple linear regression methods. Secondly, the feature weight is incorporated in to the collaborative filtering process to provide effective recommendations.

Experimental results are proved that system is outperformed in terms of computational efficiency and similarity accuracy.