

ABSTRACT

Recommender systems provide personalized suggestions for every individual user in the system. Many recommender systems use collaborative filtering approach in which the system collects and analyzes users' past behaviors, activities or preferences to produce high quality recommendations for the users. Among various collaborative recommendation techniques, model-based approaches are more scalable than memory-based approaches for large scale data sets in spite of large offline computation and difficulty to update the model in real time. This work presents a novel approach that not only improves over existing matrix factorization algorithms but also can update the model incrementally in real time. The new approach uses alternating least squares method for matrix factorization with learning biases for both user and item to improve accuracy. These learning bias values are treated as additional dimensions. As the learning process begins after regularized matrix factorization, the algorithm can update incrementally over the preference changes of the data set in constant time without rebuilding the new model again. This work includes two different experiments with three different data sets to show the performance improvement of the new algorithm.