A Survey of Collaborative Filtering Recommender Algorithms and Their Evaluation Metrics

Mahdi Jalili
School of Engineering, RMIT University, Melbourne, Australia
Mahdi.Jalili@rmit.edu.au

***Abstract*—Recommender systems are often used to provide useful recommendations for users. They use previous history of the users-items interactions, e.g. purchase history and/or users rating on items, to provide a suitable recommendation list for any target user. They may also use contextual information available about items and users. Collaborative filtering algorithm and its variants are the most successful recommendation algorithms that have been applied to many applications. Collaborative filtering method works by first finding the most similar users (or items) for a target user (or items), and then building the recommendation lists. There is no unique evaluation metric to assess the performance of recommendations systems, and one often choose the one most appropriate for the application in hand. This paper compares the performance of a number of well-known collaborative filtering algorithms on movie recommendation. To this end, a number of performance criteria are used to test the algorithms. The algorithms are ranked for each evaluation metric and a rank aggregation method is used to determine the wining algorithm. Our experiments show that the probabilistic matrix factorization has the top performance in this dataset, followed by item-based and user-based collaborative filtering. Non-negative matrix factorization and Slope 1 has the worst performance among the considered algorithms.**

***Keywords*—Social networks analysis and mining, big data, recommender systems, collaborative filtering.**

IJSMS