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A Faster Fuzzy Clustering Approach for Recommender Systems



Rajdeep Debgupta, Anish Saha and B. K. Tripathy

Abstract A recommender system has very important role nowadays, be it business, e-commerce, search engines, entertainment, etc. The need for faster, dynamic, and efficient recommender system arises with huge data on the Internet or website platform. A movie or anime recommender system has a major role in delivering improved entertainment. These recommender systems can provide much personalized recommendations, suggestion to a particular user based on one's watching habits, or other similar user's interests, ratings. Plentiful of recommendation techniques has been proposed but most are not able to provide useful recommendation within a very short span of time. In this paper, we aim to propose a fuzzy-clustering-based recommender system which is almost quite efficient and accurate as collaborative filtering (CF) technique but much faster than CF. We have achieved an improvement of approximately 4 s faster than CF techniques. Experimental data justifies the efficiency of the system.

Keywords Recommender systems · Collaborative filtering · Singular value decomposition · Fuzzy c-means · Ranking · User item · K-neighborhood clustering

1 Introduction

In today's world, we are flooded with data and its volume is increasing massively. Going back in the year of 1982, John Naisbitt said, "We are drowning in information but starved for knowledge" [1]. With growing data, we are enriched with information

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noticed that there is an improvement of 4 s and not depending on the number of clusters or neighbors. This difference in time is because of the clustering on K-neighborhood-based clustering on the basis of relatively smaller matrix, while, on the other hand, the collaborative approach is done on a relatively bigger matrix.

Even if the collaborative filtering-based recommender system is a bit better than fuzzy clustering one, the fuzzy clustering recommender system is much faster, and hence it can be considered as the better one than collaborative approach.

Future work: Further improvement can be made in similarity index measures between ratings of users and for matrix factorization of dimensionality measures, and loss convergence approaches can be implemented. Clustering on the basis of association rule mining can also be implemented.

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