

Review

Random walk based entity ranking on graph for multidimensional recommendation

Lee S., Song S., Kahng M., Lee D., Lee S. RecSys 11 (Proceedings of the 5th ACM Conference on Recommender Systems, Chicago, IL, Oct 23-27, 2011) 93-100, 2011.
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While recommendation systems so far have been focused on improving accuracy, diversity, and serendipity, Lee et al. focus on flexibility and propose a graph-based recommendation system. Here, flexibility means the capability of handling multidimensional information (location, genre, and so on) and providing various types of recommendation (items to users, items to group of users, and so on).

The authors first build a bipartite graph based on a given log in the dataset, and adapt personalized PageRank [1] to find relatedness between given queries and target entities. They conduct two types of experiments: recommending previously unseen items and recommending items that have already been consumed by the users. In particular, their proposed approach is significantly effective in the latter experiment.

They compare their proposed approach with several baselines. However, the authors need to improve their evaluation and parameter tuning measures.

In their evaluation measure, the top- k items in the ranked list are important in a recommendation system since users check these ranks more often. Thus, instead of $HR@k$ (a kind of hit ratio), they should employ nDCG (normalized discounted cumulative gain) [2], which rewards relevant items in the top-ranked results more heavily than those ranked lower.

Even if their proposed approach is effective in the second experiment mentioned above, it can recommend only one relevant item in the top ten recommended list. One of the key points in this work is adapting personalized PageRank. Thus, if the authors optimized the damping factor in personalized PageRank during parameter tuning, they could further improve recommendation accuracy. I expect the authors will address this point in their future work.

1) Haveliwala, T. H. Topic-sensitive PageRank. In *Proc. WWW 2002* ACM, 2002, 517–526.

2) Järvelin, K.; Kekäläinen, J. IR evaluation methods for retrieving highly relevant documents. In *Proc. SIGIR 2000* ACM, 2000, 41–48.

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