Item-Share Propagation Link Applying for Recommendation

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Abstract. The growth of social networks and various web services (e-commerce, e-learning, e-health, etc.) urgently requires recommendation techniques to satisfy users. Providing high-quality recommendations with a minimum of common feedback is a major challenge for a new recommendation algorithm. In this paper, we use more informative modelling with a weighted bipartite network around the item entity. The idea is to exploit the item-user connectivity to extract hidden information. The problem is to predict non-existent links based on existing links by double projection forward and backward. The results are promising with the implementation of real data sets.

Keywords: Ranking · Recommender systems · Prediction · Neighbourhood · Collaborative

1 Introduction

Recommendation systems have been widely used by companies to recommend relevant items to users by employing a similarity process. Large companies and websites such as Netflix, Amazon, Facebook, YouTube, Twitter, etc. integrate the techniques of recommendation in their servers. The methods of recommendation systems can be mainly classified into three approaches [1, 2]: the content-based approach which compares the content of the user profile with the content of the item; the collaborative approach which depends on the feedback of neighbour's ratings; and the hybrid approach which aims at objectively combining the two methods. In the literature, to predict a link in a bipartite network, most methods are based either on a binary history (like, dislike) or on the common neighbourhood of the active user. Currently, several in-depth studies are focused on modelling using bipartite networks [3, 4]. The structure of bipartite networks is perfectly adapted as a theoretical and practical model for several systems in the real world. The recommendation process in e-commerce or e-learning is modelled by a bipartite network that links two distinct sets of users and items. The recommendation task in the recommendation system is equivalent to a link prediction in a bipartite network. We have proposed Item Share propagation for Link Ranking in recommender systems (ISpLR). The method aims to determine the weighting of a link as a ranking value predicted by the