Enhancing recommender system by incorporating social information

JZUS-C (Comput & Electron)

Citation: Li-wei HUANG, Gui-sheng CHEN, Yu-chao LIU, De-yi LI, 2013. Enhancing recommender system by incorporating social information. *Journal of Zhejiang University-Science C (Computers & Electronics)*, 14(9):711-721. [doi:10.1631/jzus.CIIP1303]

- In the big data age, there has been an exponential growth of information generated on the World Wide Web. Recommender systems, which aim to alleviate information overload for social media users by presenting the most attractive and relevant content, have become more and more important
- Although extensive research for recommender systems has been conducted by a broad range of communities including social and computer scientists, physicists, and interdisciplinary researchers, most of these techniques suffer from several inherent weaknesses. One well-known challenge is the data sparseness problem
- But now, the growing and readily available social information such as user generated contents and various relationships between users, is raising new opportunities to mine users' interests accurately and mitigate the data sparseness problem considerably
- However, how to combine the different types of information together to enhance the accuracy of the recommender systems remains a huge challenge

- In this paper, based on a factor graph model, we formalize the problem in a semi-supervised probabilistic model. By defining each type of information as a factor, the missing ratings can be predicted

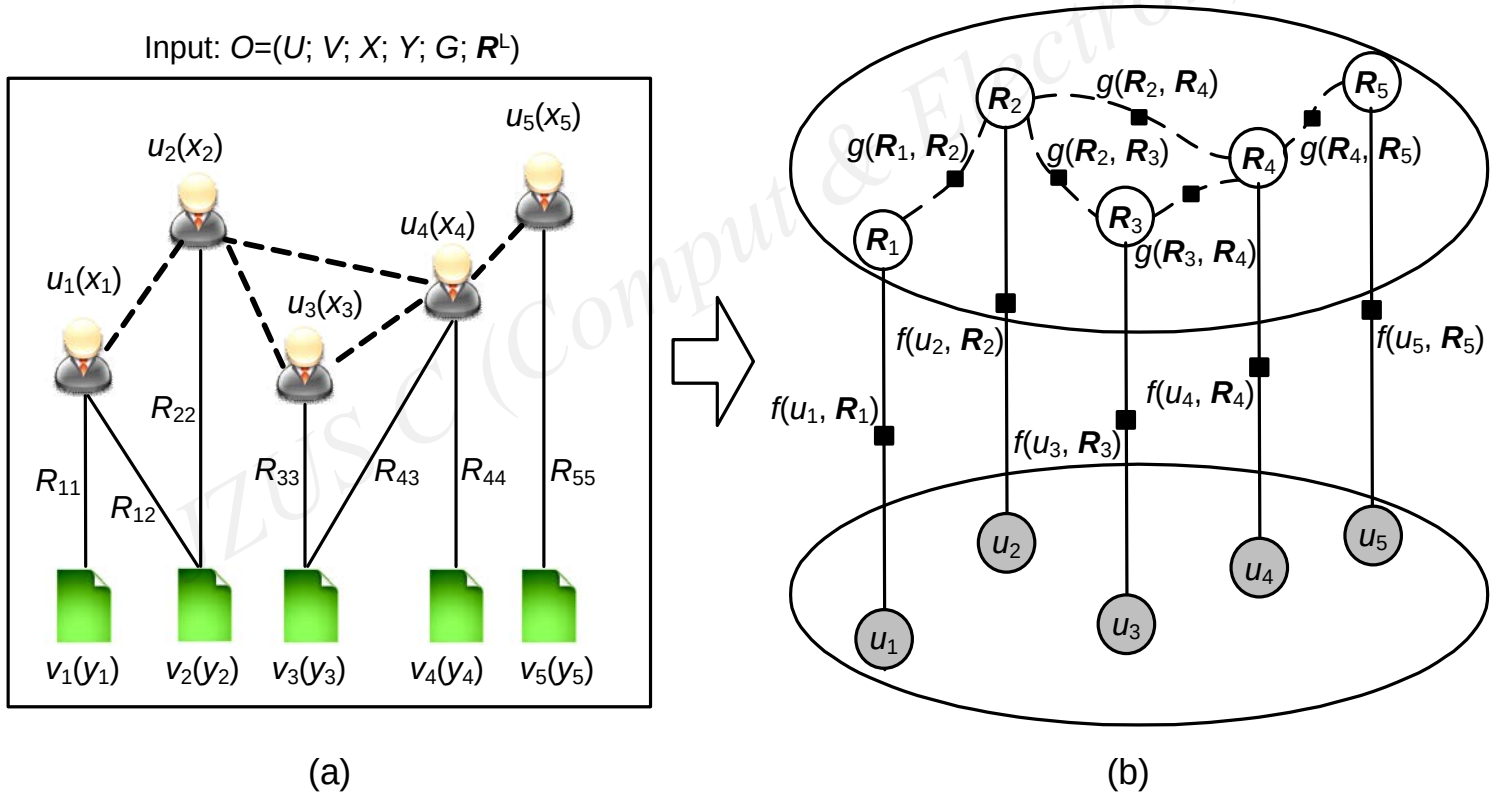


Fig. 1 Graphical representation of our model: (a) a simple example; (b) graphical representation of the model

- We evaluate the method in two different genres of datasets: Douban and Last.fm. Experiments indicate that our method outperforms several state-of-the-art recommendation algorithms. Furthermore, a distributed learning algorithm is developed to scale up the approach to real large datasets

仅考虑用户打分 | +用户关系 | +标签 | 三种数据

	NMF	PMF	Social regularization	KPMF	CFTF	Our method
Douban (70%)	1.2146	1.1974	1.1325	1.1179	0.8123	**0.7787**
Douban (80%)	1.1831	1.1773	1.1206	1.1158	0.8056	**0.7746**
Douban (90%)	1.1403	1.1385	1.0973	1.1087	0.7932	**0.7077**
last.fm (40%)	1.4790	1.4761	1.3531	1.3330	1.1224	**1.1071**
last.fm (60%)	1.4576	1.4023	1.3367	1.3075	1.1031	**1.0655**
last.fm (80%)	1.4073	1.3667	1.3265	1.2238	1.0892	**1.0427**

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