Physics > Physics and Society

Behavior patterns of online users and the effect on information filtering

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(Submitted on 10 Jul 2011)

Understanding the structure and evolution of web-based user-object bipartite networks is an important task since they play a fundamental role in online information filtering. In this paper, we focus on investigating the patterns of online users' behavior and the effect on recommendation process. Empirical analysis on the e-commercial systems show that users have significant taste diversity and their interests for niche items highly overlap. Additionally, recommendation process are investigated on both the real networks and the reshuffled networks in which real users' behavior patterns can be gradually destroyed. Our results shows that the performance of personalized recommendation methods is strongly related to the real network structure. Detail study on each item shows that recommendation accuracy for hot items is almost maximum and quite robust to the reshuffling process. However, niche items cannot be accurately recommended after removing users' behavior patterns. Our work also is meaningful in practical sense since it reveals an effective direction to improve the accuracy and the robustness of the existing recommender systems.

Comments:	8 pages, 6 figures
Subjects:	**Physics and Society (physics.soc-ph)**; Social and Information Networks (cs.SI); Data Analysis, Statistics and Probability (physics.data-an); Applications (stat.AP)
Journal reference:	Physica A 391, 1822 (2012)
Cite as:	**arXiv:1107.1900 [physics.soc-ph]**
	(or **arXiv:1107.1900v1 [physics.soc-ph]** for this version)

Submission history

From: An Zeng [view email]
[v1] Sun, 10 Jul 2011 21:18:52 GMT (251kb)

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