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## Investigating the Role of the Rating Prediction Task in Granularity-Based Group Recommender Systems and Big Data Scenarios

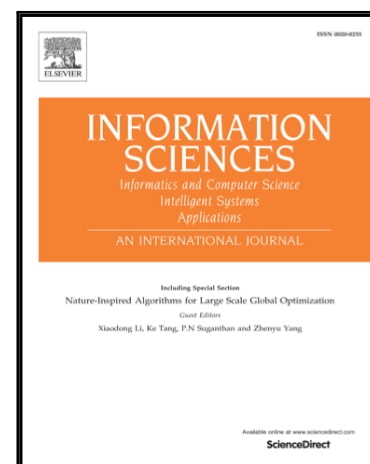
Ludovico Boratto, Salvatore Carta, Gianni Fenu

PII: S0020-0255(16)30542-4  
DOI: [10.1016/j.ins.2016.07.060](https://doi.org/10.1016/j.ins.2016.07.060)  
Reference: INS 12386

To appear in: *Information Sciences*

Received date: 1 September 2015  
Revised date: 1 July 2016  
Accepted date: 25 July 2016

Please cite this article as: Ludovico Boratto, Salvatore Carta, Gianni Fenu, Investigating the Role of the Rating Prediction Task in Granularity-Based Group Recommender Systems and Big Data Scenarios, *Information Sciences* (2016), doi: [10.1016/j.ins.2016.07.060](https://doi.org/10.1016/j.ins.2016.07.060)



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# Investigating the Role of the Rating Prediction Task in Granularity-Based Group Recommender Systems and Big Data Scenarios

Ludovico Boratto, Salvatore Carta, Gianni Fenu

*Dipartimento di Matematica e Informatica, Università di Cagliari  
Via Ospedale 72 - 09124 Cagliari (Italy)*

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## Abstract

Nowadays, one important issue for companies is the efficient dealing of the *big data problem*, which means that their business intelligence has to manage huge amounts of data. An interesting case in point is flyers distribution. Research and market figures prove that the distribution of advertising flyers still represents a valuable tool to attract potential customers to a company. It goes without saying that including personalized content in a company's flyer is more likely to yield better results than offering the same flyer to all potential clients. However, producing personalized flyers would imply unaffordable costs for a company. An efficient trade-off solution between accuracy and costs could be to define a maximum number of different flyers addressing different groups of users interested in their content. In order to systematically support this and similar trade-off solutions, we propose a novel type of group recommendations, which is able to detect a number of groups of end-users equal to the number of recommendation lists (e.g., flyers) that can be produced (i.e., the *granularity* with which the system can operate). Moreover, it can provide suggestions to the detected specific groups of users. In particular, we focus on the *rating prediction* for those items users do not evaluate. Indeed, rating prediction represents the main task that a recommender system is asked to perform and it becomes even more central if included into a group recommender system, since the predictions might be built for each user or for each group. Our approach also gives the possibility to efficiently manage the *curse of the dimensionality* phenomena caused by the sparsity of the ratings arising from big data handling. We present four granularity-based group recommender systems using different rating prediction algorithms and architectures. These systems employ the same algorithms to carry out other tasks (i.e., those that do not predict the ratings) and this allows us to evaluate which rating prediction approach is the most effective in terms of accuracy. Experiments on two real-world datasets show that, unlike group predictions, single user predictions can lead to improvements in the recommendation accuracy and the dealing of the *curse of the dimensionality* phenomena.

*Keywords:*

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