

Information Retrieval Models for Recommender Systems

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Abstract

Information retrieval addresses the information needs of users by delivering relevant pieces of information but requires users to convey their information needs explicitly. In contrast, recommender systems offer personalized suggestions of items automatically. Ultimately, both fields help users cope with information overload by providing them with relevant items of information.

This thesis aims to explore the connections between information retrieval and recommender systems. Our objective is to devise recommendation models inspired in information retrieval techniques. We begin by borrowing ideas from the information retrieval evaluation literature to analyze evaluation metrics in recommender systems [2]. Second, we study the applicability of pseudo-relevance feedback models to different recommendation tasks [1]. We investigate the conventional top-N recommendation task [5, 4, 6, 7], but we also explore the recently formulated user-item group formation problem [3] and propose a novel task based on the liquidation of long tail items [8]. Third, we exploit ad hoc retrieval models to compute neighborhoods in a collaborative filtering scenario [9, 10, 12]. Fourth, we explore the opposite direction by adapting an effective recommendation framework to pseudo-relevance feedback [13, 11]. Finally, we discuss the results and present our conclusions.

In summary, this doctoral thesis adapts a series of information retrieval models to recommender systems. Our investigation shows that many retrieval models can be accommodated to deal with different recommendation tasks. Moreover, we find that taking the opposite path is also possible. Exhaustive experimentation confirms that the proposed models are competitive. Finally, we also perform a theoretical analysis of some models to explain their effectiveness.

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The dissertation is available at: <https://www.dc.fi.udc.es/~dvalcarce/thesis.pdf>.

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