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Multiobjective E-commerce Recommendations based on Hypergraph Ranking

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Abstract

Recommender systems are emerging in e-commerce as important promotion tools to assist customers to discover potentially interesting items. Currently, most of these are single-objective and search for items that fit the overall preference of a particular user. In real applications, such as restaurant recommendations, however, users often have multiple objectives such as group preferences and restaurant ambiance. This paper highlights the need for multi-objective recommendations and provides a solution using hypergraph ranking. A general User-Item-Attribute-Context data model is proposed to summarize different information resources and high-order relationships for the construction of a multipartite hypergraph. This study develops an improved balanced hypergraph ranking method to rank different types of objects in hypergraph data. An overall framework is then proposed as a guideline for the implementation of multi-objective recommender systems. Empirical experiments are conducted with the dataset from a review site Yelp.com, and the outcomes demonstrate that the proposed model performs very well for multi-objective recommendations. The experiments also demonstrate that this framework is still compatible for traditional single-objective recommendations and can improve accuracy

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