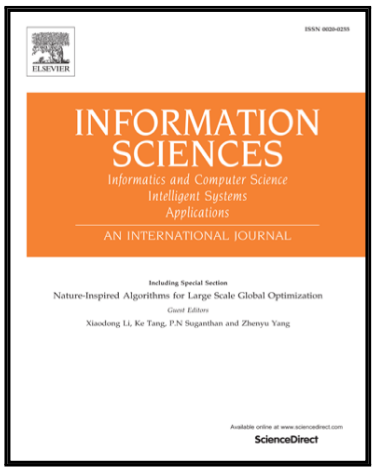

Adaptive Multi-attribute Diversity for Recommender Systems

Tommaso Di Noia, Jessica Rosati, Paolo Tomeo,
Eugenio Di Sciascio

PII: S0020-0255(16)31803-5
DOI: 10.1016/j.ins.2016.11.015
Reference: INS 12622

To appear in: *Information Sciences*

Received date: 10 February 2016
Revised date: 12 October 2016
Accepted date: 25 November 2016

Please cite this article as: Tommaso Di Noia, Jessica Rosati, Paolo Tomeo, Eugenio Di Sciascio, Adaptive Multi-attribute Diversity for Recommender Systems, *Information Sciences* (2016), doi: 10.1016/j.ins.2016.11.015

Adaptive Multi-attribute Diversity for Recommender Systems

Tommaso Di Noia[1], Jessica Rosati[2,1], Paolo Tomeo[1*], Eugenio Di Sciascio[1]

[1] *Polytechnic University of Bari – Via Orabona, 4 – 70125 Bari, Italy*

[2] *University of Camerino – Piazza Cavour 19/f – 62032 Camerino (MC), Italy*

Abstract

Providing very accurate recommendations to end users has been nowadays recognized to be just one of the tasks an effective recommender system should accomplish. While predicting relevant suggestions, attention needs to be paid also to their diversification in order to avoid monotony in the returned list of recommendations. In this paper we focus on modeling user propensity toward selecting diverse items, where diversity is computed by means of content-based item attributes. We then exploit such modeling to present a novel approach to re-arrange the list of Top-N items predicted by a recommendation algorithm, with the aim of fostering diversity in the final ranking. An extensive experimental evaluation proves the effectiveness of the proposed approach as well as its ability to improve also novelty and catalog coverage values.

1. Introduction

Recommender systems have been proposed as essential tools in assisting users to face the "information overload" problem and they have been applied across several domains [8], such as music [26], TV programs [5], taxi suggestion [22], digital libraries [3], just to cite a few of them. The main task of a recommendation engine is suggesting unknown items in a personalized way and recommend the top N items by considering the highest predicted ratings. As a result, in the recommender systems field new algorithms and approaches have been proposed over the years mostly devoted to maximizing recommendation accuracy. However, more recently, the drawbacks of building recommendation engines focusing exclusively on accuracy maximization have been also widely explored and highlighted [1, 9, 30]. Simply put, the most accurate recommendations for a user are often too similar with each

*Corresponding Author.

E-mail addresses: tommaso.dinoia@poliba.it (T. Di Noia), jessica.rosati@unicam.it (J. Rosati), paolo.tomeo@poliba.it (P. Tomeo), eugenio.disciascio@poliba.it (E. Di Sciascio).