

Accepted Manuscript

Weighted aggregation of partial rankings using Ant Colony Optimization

Gonzalo Nápoles, Rafael Falcon, Zoumpoulia Dikopoulou, Elpiniki Papageorgiou, Rafael Bello, Koen Vanhoof

PII: S0925-2312(17)30224-2
DOI: [10.1016/j.neucom.2016.07.073](https://doi.org/10.1016/j.neucom.2016.07.073)
Reference: NEUCOM 18021



To appear in: *Neurocomputing*

Received date: 22 February 2016
Revised date: 6 June 2016
Accepted date: 28 July 2016

Please cite this article as: Gonzalo Nápoles, Rafael Falcon, Zoumpoulia Dikopoulou, Elpiniki Papageorgiou, Rafael Bello, Koen Vanhoof, Weighted aggregation of partial rankings using Ant Colony Optimization, *Neurocomputing* (2017), doi: [10.1016/j.neucom.2016.07.073](https://doi.org/10.1016/j.neucom.2016.07.073)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Weighted aggregation of partial rankings using Ant Colony Optimization

Gonzalo Nápoles^{a,b}, Rafael Falcon^c, Zoumpoulia Dikopoulou^a, Elpiniki Papageorgiou^{d,a}, Rafael Bello^b, Koen Vanhoof^a

^a*Faculty of Business Economics, Hasselt Universiteit, Belgium*

^b*Department of Computer Science, Universidad Central de Las Villas, Cuba*

^c*Electrical Engineering and Computer Science, University of Ottawa, Canada*

^d*Department of Computer Engineering, Technological Education Institute of Central Greece, Greece*

Abstract

The aggregation of preferences (expressed in the form of rankings) from multiple experts is a well-studied topic in a number of fields. The Kemeny ranking problem aims at computing an aggregated ranking having minimal distance to the global consensus. However, it assumes that these rankings will be complete, i.e., all elements are explicitly ranked by the expert. This assumption may not simply hold when, for instance, an expert ranks only the top- K items of interest, thus creating a partial ranking. In this paper we formalize the *weighted Kemeny ranking problem for partial rankings*, an extension of the Kemeny ranking problem that is able to aggregate partial rankings from multiple experts when only a limited number of relevant elements are explicitly ranked (top- K), and this number may vary from one expert to another (top- K_i). Moreover, we introduce two strategies to quantify the weight of each partial ranking. We cast this problem within the realm of combinatorial optimization and lean on the successful Ant Colony Optimization (ACO) metaheuristic algorithm to arrive at high-quality solutions. The proposed approach is evaluated through a real-world scenario and 190 synthetic datasets from www.PrefLib.org. The experimental evidence indicates that the proposed ACO-based solution is capable of significantly

Email addresses: gonzalo.napoles@uhasselt.be (Gonzalo Nápoles), rfalcon@uottawa.ca (Rafael Falcon), zoumpoulia.dikopoulou@uhasselt.be (Zoumpoulia Dikopoulou), epapageorgiou@mail.teiste.gr (Elpiniki Papageorgiou), rbellop@uclv.edu.cu (Rafael Bello), koen.vanhoof@uhasselt.be (Koen Vanhoof)

Download English Version:

<https://daneshyari.com/en/article/4947314>

Download Persian Version:

<https://daneshyari.com/article/4947314>

[Daneshyari.com](https://daneshyari.com)