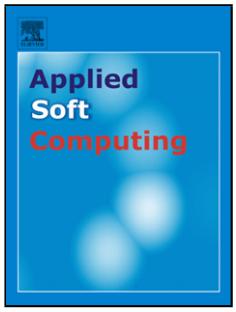

Title: Analyzing the Performance of Classical Consensus Models in Large Scale Group Decision Making: A comparative Study

Author: Á. Labella Y. Liu R.M. Rodríguez L. Martínez

PII: S1568-4946(17)30310-1
DOI: http://dx.doi.org/doi:10.1016/j.asoc.2017.05.045
Reference: ASOC 4249

To appear in: *Applied Soft Computing*

Received date: 24-1-2017
Revised date: 30-4-2017
Accepted date: 23-5-2017

Please cite this article as: Á. Labella, Y. Liu, R.M. Rodríguez, L. Martínez, Analyzing the Performance of Classical Consensus Models in Large Scale Group Decision Making: A comparative Study, *<![CDATA[Applied Soft Computing Journal]]>* (2017), http://dx.doi.org/10.1016/j.asoc.2017.05.045

Analyzing the Performance of Classical Consensus Models in Large Scale Group Decision Making: A comparative Study

Á. Labella[a], Y. Liu[a,c], R.M. Rodríguez[b,*], L. Martínez[a,d]

[a]*Department of Computer Science, University of Jaen, 23071 Jaen, Spain*
[b]*Department of Computer Science and A.I., University of Granada, Granada 18071, Spain*
[c]*College of Mathematics, Southwest Jiaotong University, Chengdu, 610000, PR China*
[d]*School of Management, Wuhan University of Technology, Wuhan, 430070, PR China*

Abstract

Consensus Reaching Processes (CRPs) in Group Decision Making (GDM) attempt to reach a mutual agreement among a group of decision makers before making a common decision. Different consensus models have been proposed by different authors in the literature to facilitate CRPs. Classical CRP models focus on achieving an agreement on GDM problems in which few decision makers participate. However, nowadays, societal and technological trends that demand the management of larger scale of decision makers add new requirements to the solution of consensus-based GDM problems. This paper presents a comparative study of different classical CRPs applied to large-scale GDM in order to analyze their performance and find out which are the main challenges that these processes face in large-scale GDM. Such analyses will be developed in a java-based framework (AFRYCA 2.0) simulating different scenarios in large scale GDM.

Keywords: `large-scale GDM`, `CRP`, `behavior`, `AFRYCA`

1. Introduction

Group Decision Making (GDM) problems, in which multiple individuals/experts with their own attitudes/opinions need to achieve a common solution to a decision problem consisting of several alternatives or possible solutions, have become the focus of a large body of research [1, 2, 3, 4]. GDM problems widely exist in diverse application areas that require the joint participation of multiple experts, such as management, engineering, politics and so on [5, 6, 7]. In the traditional resolution process of GDM problems [8], the best alternative/alternatives should be chosen after each expert provides his/her own preference over alternatives, disregarding the level of agreement

*Corresponding author
Email addresses: `alabella@ujaen.es` (Á. Labella), `rosam.rodriguez@decsai.ugr.es` (Y. Liu), `rosam.rodriguez@decsai.ugr.es` (R.M. Rodríguez), `martin@ujaen.es` (L. Martínez)