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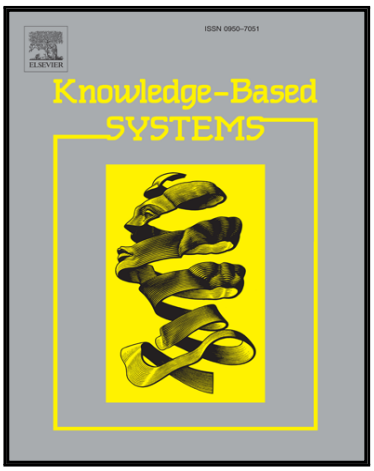

Solving multi-criteria group decision making problems under environments with a high number of alternatives using fuzzy ontologies and multi-granular linguistic modelling methods

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Solving multi-criteria group decision making problems under environments with a high number of alternatives using fuzzy ontologies and multi-granular linguistic modelling methods

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Abstract

Classic multi-criteria group decision making models that have a high amount of alternatives are unmanageable for the experts. This is because they have to provide one value per each alternative and criteria. In this paper, we focus on solving this issue by carrying out multi-criteria group decision making methods using a different novel approach. Concretely, fuzzy ontologies reasoning procedures are used in order to automatically obtain the alternatives ranking classification. Thanks to our novel methodology, experts only need to provide the importance of a small set of criteria values making it possible for experts to perform multi-criteria group decision making procedures that have a high amount of alternatives without having to directly deal with them. Furthermore, in order to allow experts to provide their preferences in a comfortable way, multi-granular fuzzy linguistic modelling is used in order to allow each expert to choose the linguistic label set that better fits him/her.

Keywords: fuzzy linguistic modelling; group decision making; computing

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