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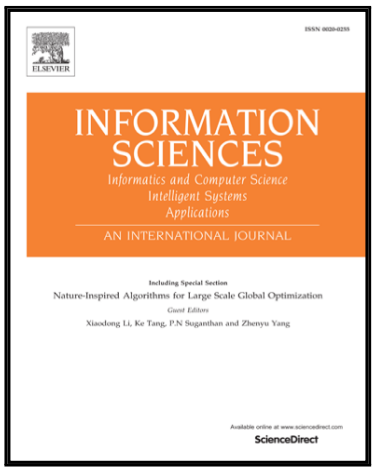

Handling Veracity in Multi-Criteria Decision-Making: A Multi-Dimensional Approach

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Handling Veracity in Multi-Criteria Decision-Making: A Multi-Dimensional Approach

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Abstract

Decision support systems aim to help a decision maker with selecting the option from a set of available options that best meets her or his needs. In multi-criteria based decision support approaches, a suitability degree is computed for each option, reflecting how suitable that option is considering the preferences of the decision maker. Nowadays, it becomes more and more common that data of different quality, originating from different data sets and different data providers have to be integrated and processed in order to compute the suitability degrees. Also, data sets can be very large such that their data become commonly prone to incompleteness, imprecision and uncertainty. Hence, not all data used for decision making can be trusted to the same extent and consequently, neither the results of computations with such data can be trusted to the same extent. For this reason, data quality assessment becomes an important aspect of a decision making process. To correctly inform the users, it is essential to communicate not only the computed suitability degrees of the available options, but also the confidence about these suitability degrees as can be derived from data quality assessment. In this paper a novel multi-dimensional approach for data quality assessment in multi-criteria decision making, supporting the computation of associated confidence degrees, is presented. Providing confidence information adds an extra dimension to the decision making process and leads to more soundly decisions. The added value of the approach is illustrated with aspects of a geographic decision making process.

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