UTAGMS/GRIP

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Abstract

We present an implementation of MCDA method called GRIP (*Generalized Regression with Intensities of Preference*) on Decision Deck platform. This method for multiple criteria ranking of alternatives from a set *A* builds a set of additive value functions compatible with preference information composed of a partial preorder and intensities of preference on a subset of alternatives A^R , called *reference alternatives*.

Using this preference model, one can define two relations in the set *A*: the necessary weak preference relation which holds for any two alternatives *a*, *b* from set *A* if and only if for all compatible value functions *a* is preferred to *b*, and the possible weak preference relation which holds for this pair if and only if for at least one compatible value function *a* is preferred to *b*. Moreover, it also gives information about intensities of preference for pairs of alternatives from this set. Distinguishing necessary and possible consequences of preference information on the set A, GRIP answers questions of robustness analysis.

This methodology can be seen as an extension of UTA and UTA^{GMS} methods based on ordinal regression. It can be also compared to MACBETH method which takes into account a preference order of alternatives and intensity of preference for pairs of alternatives.

The preference information used in GRIP does not need to be complete: the DM can compare only those pairs of reference alternatives on particular criteria for which his/her judgment is sufficiently certain.

This implementation of GRIP method used GLPK (*GNU Linear Programming Kit*) solver to conclude the truth or falsity of preference relations and the JGraph (*Java Graph visualization library*) to visualize ranking of alternatives.