



Roman Słowiński - IRSS Fellow Speaker

Poznań University of Technology, Poland

<http://idss.cs.put.poznan.pl/site/rslowinski.html>

Title of the talk: Robust Group Decision under Uncertainty and Rule Preference Model

Abstract: Preferential classification of acts described by outcomes that may be gained with some probability is a challenging problem mainly because an aggregation of the outcomes which leads to recommended classifications needs to respect preferences of a single or multiple decision makers (DMs). Moreover, the method used to assist the DMs has to satisfy their expectations concerning the type of recommendations. It should also rely on realistically available preference information, and handle a possible inconsistency of this information. Finally, it should use a preference model that aggregates the outcomes in an intelligible way, understandable by DMs.

To respond satisfactorily to the above requirements, we propose a methodology that relies on preference information in the form of classification examples provided by DMs on a subset of reference acts. As this information may be inconsistent with respect to stochastic dominance relation, it is structured using Dominance-based Rough Set Approach, and the resulting lower approximations of the quality class unions are used as an input for constructing a preference model in terms of “if..., then...” decision rules. Decision rules constitute an intelligible aggregation model that is non-compensatory and able to represent interactions between the outcomes. We induce all minimal-cover sets of rules, each one being compatible with non-ambiguous classification examples and satisfying some additional requirements imposed by the DMs, like assignment-based preference relations, and class cardinalities. Applying such compatible instances of the preference model on a set of all acts, we draw conclusions about the certainty of recommendation assured by different minimal-cover sets of rules. Then, we solve an optimization problem to get a univocal (precise) classification for all acts, taking into account the robustness concern. We also present a set of indicators and outcomes for judging the spaces of consensus and disagreement between the DMs.

Biography: Roman Słowiński is a Professor and Founding Chair of the Laboratory of Intelligent Decision Support Systems at the Institute of Computing Science, Poznań University of Technology, Poland. Since 2002 he is also Professor at the Systems Research Institute of the Polish Academy of Sciences in Warsaw. He is a full member of the Polish Academy of Sciences and, presently, elected president of the Poznań Branch of the Academy. He is also a member of Academia Europaea. In his research, he combines Operations Research and Computational Intelligence. Today Roman Słowiński is renown for his seminal research on using rough sets in decision analysis, and for his original contribution to preference modeling and learning in decision aiding. He is recipient of the EURO Gold Medal, and Doctor Honoris Causa of Polytechnic Faculty of Mons, University Paris Dauphine, and Technical University of Crete. In 2005 he received the Annual Prize of the Foundation for Polish Science – regarded as the highest scientific honor awarded in Poland. Since 1999, he is principal editor of the European Journal of Operational Research, a premier journal in Operations Research. He is coordinator of the EURO Working Group on Multiple Criteria Decision Aiding, and past president of the International Rough Set Society.