平成27年度第1回情報数理学セミナー

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博士論文中間発表会

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講演題目 ：
Uncertainty Modeling Approach in Risk Management Using Game Theory

アブストラクト ： Making decisions is a vital activity for human beings. Every time everyone takes conscientious or unconscientious decision. Hence, decision theories are in a colossal expansion through different fields of study. The consistency of the decisions, for instance, in industry or any other organization constitutes a key factor for the success of these institutions. Deciders are called to work hardly with their institutions' up level achievement in mind and this requires efficient multicriteria decision making models. In this research, firstly, we extended our previous work in terms of application. A Linear Programming (LP) model which is an equivalent alternative formulation for the Shapley value (Shapley, 1953) was successfully employed to risk management field with the purpose of solving a multi-period production planning problem. Secondly, since uncertainty is a typical issue in decision theory, that is we may deal with situations where the range of the uncertainty is known and not necessarily the distribution. Particularly in LP problems, solutions will be feasible for all the constraints when the inputs drift within the uncertainty ranges. If this is too strict, one can even provide a probability for which the solution is required to satisfy specific constraints. Thus the robustness of one's decisions is measured in terms of the best performance against all possible realizations of the parameter values. This raises the research problem in which we propose to work on, namely:
l When dealing with data-driven approach, as it is our case, optimal solutions of LP problems may become severely infeasible if the nominal data is slightly perturbed.
l The classical cooperative game theory is not a suitable tool for those situations where the values of coalitions are not known with certainty.
Having this in mind, through this study, we aim to use game-theoretic framework to model an optimization tool suitable for situation where a range of uncertainty exists in order to make coherent and valuable decisions in a multiple criteria environment.