

A reduction of cardinality to complementarity in sparse optimization

Oleg Burdakov

Linköping University, Sweden

We present a reformulation of the cardinality constraint optimization problem (CardCP) as a mathematical program in continuous variables with complementarity-type constraints. The two problems are equivalent in the sense that they have the same global minimizers. A relation between their local minimizers is also discussed. Local optimality conditions for CardCPs are derived on the base of representing cardinality constraints in a disjunctive form. A continuous reformulation of portfolio optimization problem with semi-continuous variables and cardinality constraint is given. Results of numerical experiments are presented.

Joint work with Christian Kanzow (University of Würzburg, Germany) and Alexandra Schwartz (Technical University of Darmstadt, Germany).

References

1. Oleg Burdakov, Christian Kanzow and Alexandra Schwartz, “On a reformulation of mathematical programs with cardinality constraints”, In: David Gao, Ning Ruan and Wenxun Xing (Eds), *Advances in Global Optimization*, Springer, pp. 3–14, 2015.
2. Oleg Burdakov, Christian Kanzow and Alexandra Schwartz, “Mathematical programs with cardinality constraints: Reformulation by complementarity-type constraints and a regularization method”, *SIAM Journal on Optimization*, **249**, pp. 163-174, 2017.