

Lower–Sum Order–Value Optimization

J. M. Martínez

Abstract

This is a joint work with R. Andreani, L. Martínez and F. Yano. Assume that $f_1, \dots, f_m : \Omega \subset \mathbb{R}^n \rightarrow \mathbb{R}$ and that for each $x \in \Omega$, $i_1(x), \dots, i_m(x)$ is a permutation of $1, \dots, m$ such that $f_{i_1(x)}(x) \leq \dots \leq f_{i_m(x)}(x)$. Let $p \in \{1, \dots, m\}$. The Lower-Sum Order-Value Optimization (LOVO) problem consists of minimizing $\sum_{i=1}^p f_{i_p(x)}(x)$. LOVO can be reduced to the Order-Value Optimization problem (OVO) which, in turn, is related to Risk Optimization (VaR, CVaR). Two main applications of LOVO are Robust Estimation of Nonlinear Models and Hidden-Patterns discovery. In this talk we give optimality conditions, unconstrained and constrained algorithms for solving LOVO, convergence proofs, numerical examples and applications.