

## DATA PREORDERING IN GENERALIZED PAV ALGORITHM FOR MONOTONIC REGRESSION

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摘要

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## DATA PREORDERING IN GENERALIZED PAV ALGORITHM FOR MONOTONIC REGRESSION

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**Abstract** Monotonic regression (MR) is a least distance problem with monotonicity constraints induced by a partially ordered data set of observations. In our recent publication [In Ser. {Nonconvex Optimization and Its Applications}, Springer-Verlag, (2006) 83, pp. 25-33], the Pool-Adjacent-Violators algorithm (PAV) was generalized from completely to partially ordered data sets (posets). The new algorithm, called GPAV, is characterized by the very low computational complexity, which is of second order in the number of observations. It treats the observations in a consecutive order, and it can follow any arbitrarily chosen topological order of the poset of observations. The GPAV algorithm produces a sufficiently accurate solution to the MR problem, but the accuracy depends on the chosen topological order. Here we prove that there exists a topological order for which the resulted GPAV solution is optimal. Furthermore, we present results of extensive numerical experiments, from which we draw conclusions about the most and the least preferable topological orders.

**Key words** [Quadratic programming](#) [Large scale optimization](#) [Least distance problem](#) [Monotonic regression](#) [Partially ordered data set](#) [Pool-adjacent-violators algorithm.](#)

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