

Greedy algorithms for computing informative saturated subsets

Radoslav Harman¹ and Samuel Rosa¹

¹*Comenius Univeristy in Bratislava, Slovakia*

Abstract

Optimal design or minimum-volume enclosing ellipsoid algorithms often require an initial solution that consists of a saturated subset of points – i.e., a subset whose size is equal to the number of dimensions of the points. The construction of informative saturated subsets is a non-trivial problem, as it deals with subsets that are in a sense “singular”, and is often done by a random selection of points or by a regularized heuristic.

In this talk, which is based on [2], we examine greedy algorithms for constructing saturated subsets of points that attain high values of D -optimality criterion. We propose a computationally efficient form of the method described by [1] and a modification of the Kumar-Yıldırım method [3]. We provide theoretical properties and geometrical interpretations of the methods, and we show that they outperform the commonly used random and regularized initialization methods.

Keywords

Experimental design, D -optimal design, Minimum-volume enclosing ellipsoid, Subsampling, Greedy heuristic.

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References

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