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Abstract

Privacy sets revisited

In computer simulation experiments, which have now become a popular substitute for real experiments, one usually aims to spread out the measurements uniformly across the design space, yielding so-called space-filling designs. Most of the literature on space-filling designs attempts to achieve its aim by optimizing a prescribed objective measuring a degree of space-fillingness (see eg. Pronzato and Müller, 2012). These criteria are sometimes combined with an estimation or prediction oriented criterion. Let us label those as “soft” space-filling methods. In contrast “hard” space-filling methods ensure desirable properties by enforcing constraints on the designs, as for instance provided by privacy sets (see Benková et al. 2016), such that a secondary criterion can be used for optimization. External constraints such as on the design region or else can be incorporated in a similar manner.

This talk provides a fresh look on the role of privacy sets for the construction of space-filling designs with new algorithms and new examples. In contrast to the privacy sets considered in our previous work, the new constraints guarantee some minimal distance between any two design points, which spreads out the measurements across the design space in a very natural way.

References:

Eva Benková, Radoslav Harman, and Werner G. Müller. Privacy sets for constrained space-filling. Journal of Statistical Planning and Inference, 171:1-9, 2016.

Luc Pronzato and Werner G. Müller. Design of computer experiments: space filling and beyond. Statistics and Computing, 22(3):681-701, 2012.