Mathematics > Statistics Theory

Multifidelity variance reduction for pick-freeze Sobol index estimation

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Many mathematical models involve input parameters, which are not precisely known. Global sensitivity analysis aims to identify the parameters whose uncertainty has the largest impact on the variability of a quantity of interest (output of the model). One of the statistical tools used to quantify the influence of each input variable on the output is the Sobol sensitivity index, which can be estimated using a large sample of evaluations of the output. We propose a variance reduction technique, based on the availability of a fast approximation of the output, which can enable significant computational savings when the output is costly to evaluate.

Subjects: **Statistics Theory (math.ST)**; Applications (stat.AP); Computation (stat.CO)

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