

On estimation of surrogate models for multivariate computer experiments

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Abstract Estimation of surrogate models for computer experiments leads to nonparametric regression estimation problems without noise in the dependent variable. In this paper, we propose an empirical maximal deviation minimization principle to construct estimates in this context and analyze the rate of convergence of corresponding quantile estimates. As an application, we consider estimation of computer experiments with moderately high dimension by neural networks and show that here we can circumvent the so-called curse of dimensionality by imposing rather general assumptions on the structure of the regression function. The estimates are illustrated by applying them to simulated data and to a simulation model in mechanical engineering.

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