

# Analysis of Computer Experiments with Qualitative and Quantitative Factors

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Abstract: Computer experiments with qualitative and quantitative factors occur frequently in various applications such as in engineering and infrastructure management. A common method to modeling such experiments is Gaussian process models with a meaningful correlation function. In this work, we propose a novel modeling approach to incorporating model selection into Gaussian process models with both types of factors. Several examples are given to demonstrate significant improvement in model selection and prediction.

*Key words:* Correlation matrix; Gaussian process; Kriging; Model selection.