

# Design and analysis of computer experiment with qualitative and quantitative factors

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Computer experiments with qualitative and quantitative factors occur frequently in various applications in science and engineering. Design and analysis of such experiments is not yet completely resolved. In this work, we propose a new class of designs to accommodate a large number of qualitative factors, and a flexible modeling approach to build predictive models. Several construction methods will be presented. The modeling approach makes use of a flexible function to capture the correlation among qualitative and quantitative factors. Several examples are given to demonstrate significant improvement in prediction.