

## **Incorporating prior information with random field linear model for prediction in computer experiments**

A Bayesian approach incorporating prior information on the regression parameter in conjunction with sample information with random field linear model for prediction and exploratory data analysis of observations from multi-factor computer experiments was attempted. The observations from the computer simulation model were assumed to be from a multi-variate Gaussian stochastic process and were model using random field linear model. Bayesian predictor was built using a two-stage hierarchical model assuming a multi-variate normal prior distribution for the regression parameter in the random field linear model.

The performances of the Bayesian predictor and classical Kriging predictor were compared using observations from a six factor computer experiment with single response. Prediction capabilities were compared using mean squared error of prediction as criterion. Comparisons were also made with main effect plots and two-factor joint effect plots obtained by using the two predictors.

The mean-squared errors of predictions for the two predictors differed very slightly. Both captured non-linearities and curvatures in the data and identified the same set of influential variables. The effect of use of prior information on the regression parameter appear to shrink the main effects of the factors towards the mean.