

Estimation of a Response Surface Model with Covariates Using Backfitting

by

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A thesis submitted in partial fulfillment of the
requirements for the degree of

Master of Science (Statistics)

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November 2008

ABSTRACT

The backfitting algorithm is used in estimating a response surface model with covariates in a Central Composite Design. Backfitting takes advantage of the orthogonality of the design matrix when Central Composite Design is used. Orthogonality facilitates the viability of assumptions in an additive model where backfitting is an optimal estimation algorithm.

Simulated data shows that backfitting can result to estimates and predictive ability of the model comparable to that from ordinary least squares when the model fits fairly well to the data. In cases where there are model misspecifications, while the ordinary least squares generally fails, backfitting exhibits robustness and still produces reasonable estimates and predictive ability of the fitted model.