Title:

**Nonparametric Kernel Estimation for Bayesian Means**

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This paper proposes a general nonparametric regression approach to the estimation and computation of posterior means. We first consider the case where the samples can be independently drawn from both the likelihood function and the prior density. The samples and observations are then used to nonparametrically estimate posterior mean functions. The estimation method is also applied to estimate the posterior mean of the parameter-of-interest on a summary statistic. Both the asymptotic theory and the finite sample study show that the nonparametric estimate of this posterior mean is superior to existing estimates, including the conventional sample mean.

Meanwhile, the paper discusses the case where the samples are obtained from using an Markov chain Monte Carlo (MCMC) sampling algorithm. The asymptotic theory shows that the rate of convergence of the nonparametric estimate based on the MCMC samples is faster than that of the conventional nonparametric estimation method by an order of the number of the MCMC samples. The proposed models and estimation methods are evaluated through using simulated examples.