



**Sixth Bayesian, Fiducial, and Frequentist (BFF6)
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SPEAKER TITLES/ABSTRACT

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“Coverage of Credible Intervals for Monotone Regression”

Shape restrictions such as monotonicity often naturally arise. In this talk, we consider a Bayesian approach to monotone nonparametric regression with a normal error. We assign a prior through piecewise constant functions and impose a conjugate normal prior on the coefficient. Since the resulting functions need not be monotone, we project samples from the posterior on the allowed parameter space to construct a “projection posterior”. We obtain the limit posterior distribution of a suitably centered and scaled posterior distribution for the function value at a point. The limit distribution has some interesting similarity and difference with the corresponding limit distribution for the maximum likelihood estimator. By comparing the quantiles of these two distributions, we observe an interesting new phenomenon that coverage of a credible interval can be more than the credibility level, the exact opposite of a phenomenon observed by Cox for smooth regression. We describe a recalibration strategy to modify the credible interval to meet the correct level of coverage.

This talk is based on joint work with Moumita Chakraborty, a doctoral student at North Carolina State University.