Department of Mathematical Sciences

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Colloquium Series

Friday, February 26, 2016 at 3pm in Bell Hall 143

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A new Dirichlet process mixture model for nonparametric Bayesian quantile regression

We propose a new nonparametric Bayesian approach to quantile regression using Dirichlet process mixture of logistic distributions (DPML). Many existing Bayesian quantile regression methods are based on parametric substitution of the error distribution by the asymmetric Laplace distribution, which is inconsistent with the typical nonparametric nature of quantile regression. The logistic distribution has a simple form in its quantile function and hence easily accomodates the quantile constraint. Our proposed DPML model enjoys great model flexibility by mixing over both the location parameter and the scale parameter. We further established the posterior consistency of our proposed model and provided Markov chain Monte Carlo algorithms for posterior inference. The performance of our approaches is evaluated using simulated data and real data.

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