

Robust Bayesian Regression with Synthetic Posterior

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Abstract

Regression models are fundamental tools in statistics, but they typically suffer from outliers. In this talk, we introduce robust Bayesian approaches using synthetic posterior distribution based on robust divergence. We first consider a simple linear regression model with shrinkage priors for regression coefficients. We provide an efficient posterior computation algorithm using Bayesian bootstrap within Gibbs sampling. We also demonstrate the proposed method through simulation studies and data analysis. Secondly, we consider a dynamic linear model for time series data. We modify the likelihood based on the conditional distribution of observations given latent parameters by divergence to robustify the standard Bayesian method. We provide a feasible way for posterior computation and demonstrate the proposed method using simulated data. These are joint works with Shintaro Hashimoto in Hiroshima university.