Bayesian Estimation and Prediction on Inverse Rayleigh Distribution

Sanku Dey and Tanujit Dey

St. Anthony's College and The College of William & Mary

Abstract

This article deals with Bayesian inference and prediction of the inverse Rayleigh distribution. We first obtain Bayes estimators of the inverse Rayleigh parameter and its posterior expected loss based on a conjugate prior. Then we derive the highest posterior density (HPD) and equal-tail credible intervals for the inverse Rayleigh parameter, as well as consider Bayes prediction for future observation based on the observed sample and provide the equal-tail and HPD prediction intervals. Monte Carlo simulations are performed to compare the performances of the Bayes estimates under different situations. A real data example is provided to assess how the inverse Rayleigh distribution fits a real data set. In analyzing the data, we propose a graphical technique to choose the parameter values of the conjugate prior.

Keywords: Bayes estimator, highest posterior density interval, inverse Rayleigh distribution, loss function, posterior expected loss.