

論文の内容の要旨

論文題目 Bayesian Shrinkage Approaches
 to Parametric Inference
 (パラメトリック推測への
 ベイズ的な縮小化法によるアプローチ)
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In this thesis, we use shrinkage priors to obtain good Bayesian procedures for various statistical problems. In the first half of the thesis, we mainly use hierarchical priors constructed by assuming hyperpriors for global hyperparameters in order to prove domination results. In the second half of the thesis, properties of hyperpriors for local hyperparameters are analytically investigated in terms of shrinkage and robustness, improved numerical performance of global-local shrinkage priors is shown in simulation and empirical studies, and some results for Bayesian robust regression are also obtained.

In Part II of the thesis, we first consider in Chapter 2 the problems of estimating unknown parameters and predictive densities on the basis of observations of Poisson variables. Then, in Chapters 3 and 4, similar problems are treated in the negative multinomial case. Finally, in Chapter 5, we consider the prediction problem on the basis of Chi-squared and normal samples where the predictive density to be estimated is independent of the location parameter.

In Chapters 6 and 7 of Part III, we introduce classes of heavy-tailed distributions and investigate shrinkage and tail-robustness properties of corresponding Bayesian methods both analytically and numerically in the Poisson and normal cases. In Chapter 8 of Part III, the usefulness of our heavy-tailed distributions is further illustrated in the context of robust regression.