

Title: Bayesian vs. "Classical" Estimation in Practice (for IPS092)

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Abstract: This presentation will focus on the comparative performance of the Bayesian and frequentist approaches to estimation. I will begin with a discussion of some empirical evidence that Bayes point estimators are quite robust, that is, tend to outperform the standard frequentist alternatives surprisingly often, even when the prior model for the target parameter seems rather poor. Theoretical results help understand why this happens. I'll discuss various estimation frameworks in which these general findings are replicated. All this is meant to illustrate the fact that there is a threshold, in the space of prior distributions, that separates the Bayes estimators which outperform their frequentist counterparts from those which don't. Further, the region of Bayesian domination is larger than generally thought, though the Bayesian loses his/her advantage as the dimension of the parameter space increases. The bottom line is that, on the basis of actual performance in real problems, neither approach will dominate the other, as the superiority of Bayes estimators depends strongly on whether the available prior information is "useful". A proper interpretation of the word "useful" is key to the successful use of the Bayesian approach. I'll close with a brief discussion of the comparative performance of frequentist and Bayesian interval estimates.

KEY WORDS: Bayes, frequentist, point and interval estimation, Bayes risk