A ROBUST BOUND FOR THE INTRINSIC BAYES FACTORS

DISSERTATION
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Richard A Clare Morales,
richard.clare@upr.edu
Department of Mathematics, UPR-RP.

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Abstract

In this work, we undertake a comprehensive reformulation, modification, and extension of Smith & Spiegelhalter's (1980) and (1982) Bayes Factor work within the evolving subject of Objective Bayes Factors. Our primary focus centers on defining and computing empirical and theoretical bounds for the Intrinsic Bayes Factor (IBF) across various models, including normal, exponential, Poisson, geometric, linear, and ANOVA. We show that our new bounds are useful, feasible, and change with the amount of information. We also propose a methodology to construct the least favorable (for the null model) intrinsic priors that result in the lower and upper bounds of the Intrinsic Bayes Factors under certain conditions. Notably, our lower bounds exhibit superior performance compared to the well-known $-ep\log(p)$ bound proposed by Sellke et al. (2001) (Sellke et al., 2001) based on p-values.