

BERNSTEIN VON MISES THEOREM FOR LINEAR FUNCTIONALS OF THE
DENSITY

by

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Abstract:

In this work we study the existence of the so called Bernstein von Mises property of the posterior distribution of a linear functional of the density - typically the cumulative distribution function at a given point - in a non-parametric context. In other word we determine the asymptotic posterior distribution of such a quantity and give conditions for this posterior distribution function to be asymptotically Gaussian, centered at the empirical value. When such a property is verified, there is strong matching between frequentist and Bayesian approaches since α credible intervals are also asymptotically α confidence intervals. Bernstein Von Mises theorem are known to hold in smooth parametric models and are known to be a problem in non-parametric models.

After giving a general theorem, we study more specifically sieve log-linear models.