

# BAYESIAN STATISTICS AS APPLIED PROBABILITY

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## Abstract

It is not a coincidence that the classic pioneering books on Bayesian Statistics, Laplace (1812), Jeffreys (1939/1961) and De Finetti (1970/1974) are all entitled "Probability Theory". Indeed, the complete paradigm may be described as a coherent set of applications of probability theory to situations where one is interested in probability distributions of quantities of interest conditional to the model assumed and the data observed. In this tutorial (i) the representation theorems will be revisited; these provide existence theorems for a prior distribution without the use of decision-related ideas and (ii) the basic Bayesian paradigm will be described with special emphasis on its immediate solution to hard problems in conventional statistics such as elimination of nuisance parameters, restrictions to the parameter space, prediction and complex model elaboration.

## References:

- [1 ] De Finetti, B. (1970/1974). *Teoria delle Probabilità* Turin: Einaudi. English translation as *Theory of Probability* in 1974 Chichester, UK: Wiley.
- [2 ] Jeffreys, H. (1939/1961). *Theory of Probability*. Oxford, UK: University Press. Third edition in 1961.
- [3 ] Laplace, P. S. (1812). *Théorie Analytique des Probabilités*. Paris: Courcier. Reprinted as *Oeuvres Complètes de Laplace 7, 1878–1912*. Paris: Gauthier-Villars.