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Tutorial Course

OBJECTIVE BAYESIAN MODEL SELECTION STATISTICAL PROCEDURES

by

Elias Moreno

Universidad de Granada

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Aula Cucconi

Abstract

This tutorial develops Bayesian model selection procedures without assuming subjective prior information on both the models involved and the parameters of these models. The posterior uncertainty of the models chosen will be measured by the model posterior probabilities, and the goal of the theory is thus the computation of these quantities.

An important statistic that naturally appears in the computation of the model posterior probabilities is the Bayes factor. We will analyze through some relevant problems, including the variable selection and clustering problems, the difficulties for computing Bayes factors. We will specially consider the Bayesian Information Criterion (BIC), a well-known approximation to the Bayes factor developed by Schwarz (1987), and the relatively recent Bayes factor for intrinsic priors (Berger and Pericchi 1996, Moreno 1997, Moreno et al. 1998). These latter priors are nowadays recognized to be objective prior that provides Bayes factors having excellent properties for small and large samples sizes.

via C. Battisti, 241 - 35121 Padova, Italia - tel 0498274168 – fax 0498274170