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Seminar

ALL ABOUT PEP

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Room Benvenuti | Campus S. Caterina

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The talk will start with a brief discussion to the problem of objective Bayesian model comparison. The general principles, criteria and tools/mechanisms that can be used in order to ensure a sensible Bayesian model comparison/selection procedure under the absence of any prior information will be presented and discussed. Focus will be given in the most popular model selection case: the variable selection problem.

One of the main approaches used to construct prior distributions for objective Bayes model selection is the concept of random imaginary observations. The power-expected-posterior (PEP) prior was recently introduced in order to alleviate the amount of information introduced by the size of the training dataset. In this talk the PEP methodology for the variable selection problem under normal linear models is presented. The theoretical properties of the prior are discussed and focus is given on the consistency of the Bayes factor, under different power parameters, when the dimension of the full model can also increase. It is shown that the PEP prior can be represented as a mixture of g-prior, like a wide range of prior distributions under normal linear models, and thus posterior distributions and Bayes factors can be derived in closed form, keeping therefore computational tractability. Comparisons with other mixtures of g-prior are made and emphasis is given in Bayesian model average estimation. Additionally, an appealing idea based on sufficiency is presented, aiming to further reduce computational cost. Finally, different versions of the PEP prior are introduced and compared according to their properties and behavior in simulated examples, under the broader framework of generalized linear models.