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STATISTICS COLLOQUIUM

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TALK: 4:15 PM — SCIENCE CENTER 300H
RECEPTION: 3:50 PM

“Testing as a Mixture Estimation Issue”

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ABSTRACT

We consider an apparently novel paradigm for Bayesian testing of hypotheses and Bayesian model comparison. Our alternative to the traditional construction of posterior probabilities that a given hypothesis is true or that the data originates from a specific model is to consider the models under comparison as components of an embedding mixture model. We therefore replace the original testing problem with an estimation perspective that focus on the probability weight of a given component within a mixture model. We analyse the sensitivity on the resulting posterior distribution on the weights of various prior modelling on the weights. We stress that a major appeal in using this novel perspective is that some generic improper priors are acceptable, while preserving convergence properties. This extension to the standard framework is due to an arbitrary reparameterisation of the models that gives a true meaning to the notion of "common" parameters. When using a reference Beta $B(q,q)$ prior on the mixture weights, we note that the sensitivity of the posterior estimations of the weights to the choice of q vanishes with the sample size increasing and advocate the default choice $q=0.5$, derived from Rousseau and Mengersen (2011).

Joint work with K. Kamary, K. Mengersen and J. Rousseau.