ABC and empirical likelihood

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Approximate Bayesian computation (ABC) has now become an essential tool for the analysis of complex stochastic models when the likelihood function is unavailable. The well-established statistical method of empirical likelihood however provides another route to such settings that bypasses simulations from the model and the choices of the ABC parameters (summary statistics, distance, tolerance), while being provably convergent in the number of observations. Furthermore, avoiding model simulations leads to significant time savings in complex models, as those used in population genetics. The ABCel algorithm we present in this talk provides in addition an evaluation of its own performances through an associated effective sample size. The method is illustrated on several realistic examples. (Joint work with K.L. Mengersen and P. Pudlo)