Introduction to "Pre-processing for approximate Bayesian computation in image analysis" by M. Moores, C. Drovandi, K. Mengersen, C. Robert

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Approximate Bayesian computation has proven to be a valuable approach in the Bayesian analysis of statistical models with intractable likelihood models. At the heart of this approach is the requirement to sample from the likelihood model. However in certain contexts this requirement can result in excessive computational costs. This is certainly the case for the Potts model which is used in image analysis and which concerns this paper. The approach presented here directly addresses this impasse. In a nutshell, the approach involves a pre-computing step where pseudo-data are drawn from the likelihood model for a grid of parameter values. In turn this allows one to estimate the sampling distribution of the summary statistics (which are sufficient in the case of the Potts model) using a tractable parametric model. These estimated sampling distributions can then be used in an online ABC procedure *without* the need to draw from the likelihood. In essence this is a very simple, yet powerful idea. The dramatic reduction in computation time that results from using this pre-processing approach suggest that the ideas developed in this paper surely deserve further study. For example, this technique relies on the parameter θ being low-dimensional and it would be of interest to explore how to extend this approach to higher-dimensional models, thereby widening the scope of this paper. Moreover, as has been pointed out by reviewers, there are connections to the area of indirect inference. It would be of considerable interest to further explore these connections. As such, this paper is likely to lead to stimulate further research in these and other directions.

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