

Approximate Bayesian computation via the energy statistic

Hien Duy Nguyen.

Department of Mathematics and Statistics, La Trobe University, Australia.

18 June 2020, 11:30 UK time

Abstract

Approximate Bayesian computation (ABC) has become an essential part of the Bayesian toolbox, for addressing problems in which the likelihood function is prohibitively expensive to compute, or when it is entirely unknown. ABC defines a pseudo-posterior distribution by comparing observed data with simulated data, traditionally using some summary statistic, which may be difficult to elicit. Recently, data discrepancy measures have been proposed in order to bypass the problem of constructing summary statistics. In this talk, we follow this approach and propose an ABC algorithm using the so-called two-sample energy statistic.

Using the energy statistic as our data discrepancy measurement, we establish various theoretical results such as convergence of the posterior distribution as the sample size becomes large and as the rejection threshold becomes small. Application of our approach is demonstrated on a variety of models and compared against some alternative discrepancy measurement-based methods.

This is joint work with Julyan Arbel, Hongliang Lü, and Florence Forbes (Inria, Grenoble Rhône-Alpes).