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Approximate Bayesian Computation (ABC) scheme to parametrize dynamical systems

In many real-world applications the computational cost of evaluating the full likelihood of a model is prohibitive. Therefore some trade-off has to be made between model complexity and level of statistical sophistication. ABC methods can be used to approximate posterior distribution using summary statistics when likelihood functions are intractable or difficult to evaluate. Traditionally, acceptance rates in ABC have been very low and ABC sampler based on Sequential Monte Carlo (ABC SMC) offers some improvements. We show that this approach can be used to obtain reliable parameter estimates for ODE and stochastic models of biological systems. We explore the power of this approach in simulation studies. Initial results suggest that ABC SMC provides a flexible framework for drawing statistical inferences from deterministic and stochastic models of biological systems.