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IMPROVING THE EFFICIENCY OF LIKELIHOOD-FREE COMPUTATION

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In recent years there has been considerable interest in Bayesian applications where the likelihood function is computationally intractable. Most of these applications, and therefore the methods development, has occurred outside of mainstream Statistics publications, primarily in population genetics and epidemiology.

In this presentation we outline the basic idea behind “likelihood-free” Bayesian computation. Following this setup we demonstrate that while certain method specifications are arbitrary in theory (in that the correct model is realised asymptotically regardless of their specification), in practice they can have an overwhelming influence on the efficiency of the computation. We propose simple methods to automate model setup and improve the efficiency of its implementation, and illustrate them through real analyses.