

Parameter estimation using moment-closure methods

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This poster will tackle one of the key problems in the new science of systems biology: inference for the rate parameters underlying complex stochastic kinetic biochemical network models, using partial discrete time-course measurements of the system state. Although inference for exact stochastic models is possible, it is computationally intensive for relatively small networks.

We explore the Bayesian estimation of stochastic kinetic rate parameters using approximate models, based on moment closure analysis of the underlying stochastic process. By assuming a Gaussian distribution and using moment-closure estimates of the first two moments, we can greatly increase the speed of parameter inference. The parameter space can be efficiently explored by embedding this approximation into an MCMC procedure.