

1096-60-537

Elizabeth Skubak Wolf* (skubak@math.wisc.edu). *Parameter Sensitivities for Discrete Stochastic Models in Continuous Time.*

In the analysis of parametrized models used in a wide range of fields including queueing theory, population processes, and chemical reaction networks, knowledge of parameter sensitivities is extremely useful. For example, these sensitivities, given by derivatives of system outputs with respect to model parameters, can significantly increase the efficiency of an optimization algorithm.

In the setting of cell biology, the advent of new technologies such as green fluorescent proteins have shown that stochastic models capture the dynamical behavior of the constituent molecules significantly better than deterministic models. Consequently, usage of these stochastic models has increased dramatically over the past decade. Determining the best ways to find or approximate the sensitivities of stochastic models is an interesting question, and a variety of methods have been developed in the last few years. In this talk I will discuss a relevant family of continuous time Markov chain models and highlight some of the sensitivity methods in this setting. I will also introduce new methods for these models which have little or no bias, as well as a low variance which leads directly to high efficiency. (Received September 05, 2013)