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Suzanne Sindi*, 5200 North Lake Road, Merced, CA 95340. *Modeling and Parameter Inference in Biological Systems.*

Biological systems are inherently complex, and mathematical modeling is a natural tool for gaining intuition and generating novel hypotheses. However, a critical challenge in biological systems is their uncertainty. Uncertainty can take place in many forms, and this talk will explore two of them.

First, even if we have knowledge of mechanisms in biology, we often do not know critical parameters in how critical components interact. In this talk I will describe efforts to use Bayesian parameter inference and model selection to discover the correct model and its corresponding values.

Second, in the analysis of mathematical models we often focus on asymptotic behavior. However, true biological systems operate on finite time scales. In this work we are interested in studying a problem in cell biology where a critical event must take place before the cell divides. We frame this problem as calculating the first arrival times of a stochastic process. (Received September 16, 2020)