



THE UNIVERSITY OF  
**CHICAGO**

Department of Statistics  
**STATISTICS COLLOQUIUM**

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**Stochastic Inference of Dynamic System Models: From  
Single-Molecule Experiments to Statistical Estimation**

**MONDAY, April 7, 2014, at 4:00 PM**

133 Eckhart Hall, 5734 S. University Avenue

*Refreshments following the seminar in Eckhart 110*

**ABSTRACT**

Dynamic systems, often described by coupled differential equations, are used in modeling diverse behaviors in a wide variety of scientific areas. In this talk we will consider their assessment and calibration in light of experimental/observational data. For the assessment, we explore how the deterministic dynamic system models reconcile with stochastic observations, using recent single-molecule experiments on enzymatic reactions as an example. For the calibration, we will propose a new inference method for the parameter estimation of dynamic systems. The new method employs Gaussian processes to mirror a dynamic system and offers large savings of computational time while retains high estimation accuracy. Numerical examples will be used to illustrate our estimation method.

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For further information and inquiries about building access for persons with disabilities, please contact Kirsten Wellman at 773.702.8333 or send her an email at [kwellman@galton.uchicago.edu](mailto:kwellman@galton.uchicago.edu). If you wish to subscribe to our email list, please visit the following website: <https://lists.uchicago.edu/web/arc/statseminars>.