



THE UNIVERSITY OF  
CHICAGO

Department of Statistics

STATISTICS COLLOQUIUM

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CYNTHIA RUDIN

Departments of Computer Science & Electrical and Computer Engineering  
Duke University

Two Mini-talks: (i) Prediction Deviation and Optimal Experimental Design in Dynamical Systems, and (ii) Regulating Greed over Time in Multi-Armed Bandits

MONDAY, April 10, 2017, at 4:00 PM

Eckhart 133, 5734 S. University Avenue

*Refreshments before the seminar at 3:30PM in Jones 111*

ABSTRACT

(i) I will discuss work on measuring uncertainty in parameter estimation for dynamical systems. I will present "prediction deviation," a new metric of uncertainty that determines the extent to which observed data have constrained the model's predictions. This is accomplished by solving an optimization problem that searches for a pair of models that each provide a good fit for the observed data, yet have maximally different predictions. We develop a method for estimating (a priori) the impact that additional experiments would have on the prediction deviation, allowing the experimenter to design a set of experiments that would most reduce uncertainty.

(ii) In retail, there are predictable yet dramatic time-dependent patterns in customer behavior, such as periodic changes in the number of visitors, or increases in visitors just before major holidays (e.g., Christmas). The current paradigm of multi-armed bandit analysis does not take these known patterns into account which means that despite the firm theoretical foundation of these methods, they are fundamentally flawed when it comes to real applications. This work provides a remedy that takes the time-dependent patterns into account.

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For further information and about building access for persons with disabilities, please contact Courtney Tillman at 773.702.8333 or send email (cmtillman@galton.uchicago.edu). If you wish to subscribe to our email list, please visit the following website: <https://lists.uchicago.edu/web/arc/statseminars>