

STATISTICS COLLOQUIUM

MONDAY, APRIL 05, 2010

TALK: 4:00 PM — SCIENCE CENTER, ROOM 309

RECEPTION: 5:15 PM — SCIENCE CENTER, 7TH FLOOR

“Mitigating Manhole Events in Manhattan using Machine Learning”

Cynthia Rudin

MIT

Sloane School of Management

ABSTRACT

There are a few hundred manhole events (fires, explosions and smoking manholes) in Manhattan every year, often stemming from problems in the low voltage secondary electrical distribution network that provides power to residential and commercial customers. I will describe work on the Columbia/Con Edison Manhole Events project, the goal of which is to predict manhole events in order to assist Con Edison (NYC's power utility) with its pre-emptive maintenance and repair programs. The success of this project relies heavily on an understanding of the current state of Manhattan's grid, which has been built incrementally over the last century. Several sources of Con Edison data are used for this task, the most important of which is the ECS (Emergency Control Systems) database, consisting of trouble tickets from past events that are mainly recorded in free text by Con Edison dispatchers.

In this talk, I will discuss the data mining process by which we transformed extremely raw historical Con Edison data into a ranking model that predicts manhole vulnerability. A key aspect in this process is a machine learning method for ranking, called the "P-Norm Push." Our ranked list is currently being used to prioritize future inspections and repairs in Manhattan.

This is joint work with Becky Passonneau, Axinia Radeva, and Haimonti Dutta at the Center for Computational Learning Systems at Columbia University, and Delfina Isaac and Steve Jerome at Con Edison.