

Mitigating Manhole Events in Manhattan

Cynthia Rudin

Tuesday, October 12

Lecture: 4:15 PM

Room 66-110, Landau Building

Reception to follow

Massachusetts Institute of Technology
25 Ames Street
Cambridge, Massachusetts



There are a few hundred manhole events (fires, explosions, smoking manholes) in New York City 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 company) with its pre-emptive maintenance and repair programs. The success of this project relied heavily on an understanding of the current state of Manhattan's grid, which has been built incrementally over the last century. Several different sources of Con Edison data are used for the project, 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 lists are currently assisting with the prioritization of future inspections and repairs in Manhattan, Brooklyn, and the Bronx.

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

About the Speaker

Cynthia Rudin is an Assistant Professor at MIT Sloan, joining MIT in the summer of 2009. Previously, Dr. Rudin worked as an Associate Research Scientist at the Center for Computational Learning Systems at Columbia University, where she led the Columbia/Con Edison Project on Manhole Event Prediction. She holds an undergraduate degree from SUNY Buffalo, and received a PhD in Applied and Computational Mathematics at Princeton University in 2004, after which she was an NSF postdoctoral research fellow at NYU. She works on problems in theoretical and applied machine learning. Professor Rudin's research interests include statistical learning theory and applications of machine learning to industrial problems.