The University of Chicago
Department of Statistics

Seminar Series

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Supervised Ranking for Manhole Event Mitigation

MONDAY, February 23, 2009 at 4:00 PM
133 Eckhart Hall, 5734 S. University Avenue
Refreshments following the seminar in Eckhart 110.

ABSTRACT

I will describe work on the Columbia/Con Edison Manhole Events project. An important goal of the project is to produce a ranked list of manholes and service boxes in Manhattan, in order of vulnerability to serious events such as fires, explosions, and smoking manholes. This list will assist Con Edison with prioritization of repair work. Of over 50,000 manholes and service boxes, only 0.1 to 1 percent are implicated in a given event each year, so the top of the ranked list needs to be very accurate. 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 historical trouble tickets from past events that are mainly recorded in free text by Con Edison dispatchers.

For the ranking task, I will describe a supervised ranking algorithm that concentrates at the top of a ranked list, called the "P-Norm Push." The problem of supervised ranking is to order a set of objects based on a sample of labeled preference data. Such problems arise not only for the manhole event prediction problem, but also for many other industrial prioritization problems, information retrieval tasks such as document retrieval, and other applications in natural language processing such as name tagging. In many of these applications, the ranking accuracy at the top of the list is more important than farther down the list.

I will introduce the problem of manhole event prediction and derive the P-Norm Push algorithm along with some theoretical properties. Results on a blind prediction test indicate the usefulness of this approach for mitigation of future manhole events in Manhattan.

Papers relating to this talk can be found at:
http://www1.ccls.columbia.edu/ rudin/main.html, listed under "Manhole Events" and "P-Norm Ranking." This work is in collaboration with Rebecca Passonneau, Axinia Radeva, Robert Schapire, Ingrid Daubechies, Heng Ji, Ralph Grishman, and several others.

For further information and about building access for persons with disabilities, please contact Kelly Macias at 773.834.5169 or send email (kmacias@galton.uchicago.edu). If you wish to subscribe to our email list, please visit the following web site: https://lists.uchicago.edu/web/info/statseminars.