



**The Hong Kong Polytechnic University
Department of Applied Mathematics**

Colloquium

On

Understanding uncertainty in network design

by

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Abstract

Network design is an important class of integer programs. Its deterministic versions are well studied and many solution procedures are developed. But for many industrial problems even deterministic problems are too large to be solved to optimality; in fact even heuristic procedures struggle with these problems. On the other hand, deterministic modelling is not very realistic in most cases. Networks are often designed for a long life, and the conditions under which they must operate are not well understood when the networks are designed. In particular, demand is typically not known up front.

The purpose goal of this research is to understand what uncertainty does to the optimal solutions to this class of problems. We can only study small problem instances, but by doing so, we are able to observe structural properties of the solutions to the stochastic models, and how they differ from their Deterministic counterparts. Also, we study if deterministic solutions, even if bad in their own rights, contain useful information for the stochastic case.

These results play two roles. Firstly, very simply, they inform us what optimal solutions "should" look like. This is useful when studying existing solutions and when communicating with the problem owners. Secondly, knowing the structure of optimal solutions can help us develop heuristics for the stochastic cases, for example by defining neighbourhoods in search heuristics.

Date : December 21, 2011 (Wednesday)
Time : 3:00 p.m. – 4:00 p.m.
Venue : HJ610, The Hong Kong Polytechnic University

*** * * ALL ARE WELCOME * * ***