

# 國家理論科學研究中心數學組 (臺北辦公室)

## IAMS / NCTS-TPE Applied Math Seminar

**Speaker:** Prof. Henry Horng-Shing Lu (Institute of Statistics, National Chiao Tung University)

**Title:** Integration of Boolean and Bayesian Networks

**Abstract:**

Gene regulation pathway or gene regulation network is referred to as one great challenge in biological research. For decades, Bayesian and Boolean networks have been studied to provide reasonable network structure to this problem. However, reconstructing network is a difficult problem. In this study, we propose a new method to integrate the approaches of Boolean and Bayesian networks, termed as the Boolean-Bayesian network, to suggest a reasonable network structure. Boolean-Bayesian network first suggests a set of relations from s-p-score associated with networks (SPAN) method, and identify the proper network by maximizing the posterior. Then, the relevant conditional probabilities can be computed for each relation in the network. Simulated result and empirical study have been used to illustrate the network learning by this method. This study shows that Boolean-Bayesian network can speed up the process in finding the network structure, and provide statistical inference as Bayesian network.

**Time:** Oct. 22 (Wed.) 13:20 – 14:20

**Venue:** R202, Astro-Math Building (NTU Campus)

**Organizer:** Jenn-Nan Wang (NTU)

For more information, please refer to <http://www.cts.ntu.edu.tw/>, or contact "cts\_tpe@math.cts.ntu.edu.tw"