



DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE  
THE UNIVERSITY OF HONG KONG

40<sup>th</sup> Anniversary Seminar Series

**Professor Fuzhou GONG**

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will give a talk

entitled

**STABILITY OF RANDOM NETWORKS**

Abstract

Recently, there has been considerable interest in studying scale free random network. Although the study of real-world networks as graphs goes back some time, recent activity perhaps was started with the paper of Watts and Strogatz about the "small world phenomenon". Specially, Barabási and Albert proposed a scale-free model and suggested that many real world networks have a power law degree distribution, which is different from the classical random graph introduced by Erdos-Renyi and Gilbert. Since then, the main focus of attention has shifted to the 'scale-free' nature of the random networks. Many scientists in different fields have done many different works in the topic, and so many new models and their analysis have been provided. Some works come with empirical and simulative results, while there are only a few mathematical models to describe the scale free random networks.

In this talk, firstly we will introduce some nations and notations in random networks. Secondary, we will propose a mathematical model to describe the sale-free networks for Barabási-Albert models. The model can be looked as a graph valued Markov Chain. We proved that there is a stationary power law degree distribution independent on their initial conditions. Moreover, we noticed that the stationary degree distribution only depends on the marginal distributions and the boundary conditions in the random networks. We found that our models have the high clustering coefficients. Finally, we found that the 2-dimension joint distribution had much effect on the clustering coefficients of Barabási-Albert type random networks, and proposed the definition of correlation of Barabási-Albert type random networks. We proved that, it has the high clustering coefficient if the network is positive correlative. We also gave some discussions of the network which is negative correlative.

on

**Wednesday, November 14, 2007**

**2:00 p.m. – 3:00 p.m.**

at

**Room 524, Meng Wah Complex  
(behind the Chong Yuet Ming Amenities Centre)**

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