

*For favour of posting*

DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE  
THE UNIVERSITY OF HONG KONG

Seminar

**Professor HUANG Dawei**

Bell Labs Research China

will give a talk

entitled

## **THOUGHTS ON ARTIFICIAL INTELLIGENCE AND STATISTICS**

Abstract

Information technology has forwarded our society into an era of machine intelligence. We are facing unprecedented and profound changes. In this upheaval, how should statistics integrate with information technology and what role should statistics play?

First, how human intelligence works? Human learning methods include two steps: induction and deduction. In induction, we abstract premises from facts that appear in multiple scenarios and repeat many times. In deduction, we derive conclusions from the premises by logic and mathematics. Both premises and conclusions need to be tested and validated by reality. The interaction between practice, promises and conclusions are key for scientific intelligence.

In information technology, data represents a record of the processes and results of practice. The booming technology of big data provides a solid foundation for machine intelligence. Based on that computer scientists and electronic engineers have made the machine to identify image and speech, the most important two functions for human. Under the guidance of bionics, they developed neural networks and genetic algorithms, which extract features from many information sources and derive conclusions by multi-layer deductive system. The entire system learns from data constantly, then adjust with data repeatedly. Currently, handwriting input has become the standard configuration in smart phones. However, Artificial Intelligence in the text, image and voice recognition still only reach the level of primary school students. The reason may be that by simply imitating the human nervous system is not sufficient. Many principles of intelligence are based on philosophy, logic and psychology, which in turn involve statistical ideas. For example, conditioned responses in neurophysiology can be described by conditional probability, some association functions for human brain can be represented by the Markov chains. Further, while the bionic can provide us with inspiration, problem solving in the real world requires a deeper understanding of the essence of the matter, namely, summarizing premises from practice, deducing conclusions from premises and testing conclusions by practice. In this cycle, statistics is an important tool.

How to use statistical methods with considering bionic, philosophy and logic to build a statistical intelligent system is a huge challenge for statisticians. In this talk, we will try to show several statistical approaches which may help us in this direction.

on

**Monday, December 5, 2016**

*(Refreshments will be served from 10:45 a.m. outside Room 301 Run Run Shaw Building)*

**11:00 a.m. – 12:00 noon**

at

**Room 301, Run Run Shaw Building**

**Visitors Please Note that the University has limited parking space. If you are driving please call the Department at 3917 2466 for parking arrangement.**

All interested are welcome