## WILLIAM BENTER DISTINGUISHED LECTURE SERIES

A Series of Distinguished Lectures in Pure and Applied Mathematics organized by Liu Bie Ju Centre for Mathematical Sciences City University of Hong Kong

## Intelligence and Learning in Brains and Machines

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## Abstract

Learning is the gateway to understanding intelligence in biological organisms and to reproducing it in machines. In this context, I will introduce modern learning theory and sketch some of its mathematical foundations centered on conditions for prediction. A classical example of learning algorithms is provided by regularization in Reproducing Kernel Hilbert Spaces. Neuroscience, however, suggests a hierarchical architecture for learning which classical algorithms do not have. I will describe a new attempt (with S. Smale) to develop a mathematics for hierarchical kernel machines—centered around the notion of a recursively defined "derived kernel"—and directly suggested by the neuroscience of the visual cortex. I will conclude with a proposal to extend this feed forward architecture to reflect the recursive organization of cortex.

Date : Wednesday, 23 September, 2009

Time : 16:30

Venue : CSE Conference Room B6605, Blue Zone, 6/F, Lift No. 3, Academic Building, City University of Hong Kong

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