



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

**Seminar
on**

**Integral Equation Models for Image Restoration:
High Accuracy Methods and Fast Algorithms**

by

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Abstract

In this talk, I will present my recent joint work with Yao Lu and Lixin Shen on integral equation based image restoration methods.

Discrete models are consistently used as practical models for image restoration. They are piecewise constant approximations of the true physical (continuous) model, and hence, inevitably impose bottleneck model errors. We propose to work directly with the continuous model for image restoration aiming at suppressing the model errors caused by the discrete models. A systematic study is conducted for the continuous out-of-focus image models which can be formulated as an integral equation of the first kind. The resulting integral equation is regularized by the Lavrentiev method and the Tikhonov method. We develop fast multiscale algorithms having high accuracy to solve the regularized integral equations of the second kind. Numerical experiments show that the methods based on the continuous model perform much better than those based on discrete models, in terms of PSNR values and visual quality of the reconstructed images.

Date : 23 October, 2009 (Friday)
Time : 3:00 – 4:00 p.m.
**Venue : Departmental Conference Room HJ610
The Hong Kong Polytechnic University**

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