

**Acceleration methods for total  
variation-based image denoising and  
deblurring**

**Dr. Xu Jing**  
Research Fellow,  
Division of Mathematical Sciences,  
Nanyang Technological University,  
Singapore



**Date :** 4 February 2009 (Wednesday)  
**Time :** 3.30 pm – 4.30 pm  
**Venue:** SPMS-Executive Classroom 1, MAS-03-06  
School of Physical and Mathematical Sciences

We focus on deblurring and denoising problems.

For a given blur, we apply a fixed point method to solve the total variation-based image restoration problem. A new algorithm for the discretized system is presented. Convergence of outer iteration is efficiently improved by adding a linear term on both sides of the system of nonlinear equations. In inner iteration, an algebraic multigrid (AMG) method is applied to solve the linearized systems of equations. We adopt the Krylov subspace method to accelerate the outer nonlinear iteration.

For the blur is unknown, we combine our algorithm for a given blur operator with an alternating minimization implicit iterative scheme to deal with blind deconvolution problem, recover the image and identify the point spread function(PSF). The only assumption needed is to satisfy the practical physical sense.

This is a joint work with Professor Qianshun Chang and Weicheng Wang.

Host: Mathematical Imaging and Vision Research Group, Division of Mathematical Sciences,  
School of Physical and Mathematical Sciences  
Website: <http://www1.spms.ntu.edu.sg/~image>

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NANYANG TECHNOLOGICAL UNIVERSITY  
SPMS-MAS-03-01, 21 NANYANG LINK, SINGAPORE 637371  
FAX: +65 6515 8213 TEL: +65 6513 7423