THE UNIVERSITY **OF HONG KONG**

Institute of Mathematical Research
Department of Mathematics

Computational Science Seminar

A Regularization Parameter Selection Model for Total Variation Based Image Noise Removal

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Abstract

Total variation regularized model is a powerful tool in image noise removal due to its ability to preserve edges in the image. One important task in the model is to determine the regularization parameter which balances the data-fidelity with the regularity of the denoised image. Discrepancy principle is a classical method to choose the regularization parameter, which bounds the value of the data-fitting term with an upper bound parameter. Comparison to the regularization parameter, it is easier to estimate the parameter of upper bound since the statistics of the noise is known. The contributions are two-fold: first, we propose an iterative algorithm to estimate an optimal upper bound by applying the consistency between the value of data-fitting term and the upper bound. Second, we develop a dual-based method to solve the constrained problem which can avoid to directly compute the Lagrangian multiplier associated with the constraint. The new algorithm can simultaneous find the solution of the constrained problem and, as a by-product, estimate the regularization parameter. Numerical results are given to show that the proposed algorithm is better than some state-of-the-art methods in both speed and accuracy.

Date:	July 20, 2018 (Friday)
Time:	2:30 – 3:30pm
Venue:	Room 309, Run Run Shaw Bldg., HKU

All are welcome