The Hong Kong University of Science and Technology

Department of Mathematics

Seminar on Applied Mathematics

HIRE:Harmonic Incompatibility REmoval Model for Whole Brain Susceptibility Imaging

by

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Abstract

Quantitative susceptibility mapping (QSM) uses the phase data in magnetic resonance signal to visualize a three dimensional susceptibility distribution by solving the magnetic field to susceptibility inverse problem. Due to the presence of zeros of the integration kernel in the frequency domain, QSM is an ill-posed inverse problem. Although numerous regularization based models have been proposed to overcome this problem, the incompatibility in the field data has not received enough attention, which leads to deterioration of the recovery. In this talk, we show that the data acquisition process of QSM inherently generates a harmonic incompatibility in the measured local field. Based on such discovery, we propose a novel regularization based susceptibility reconstruction model with an additional sparsity based regularization term on the harmonic incompatibility. Numerical experiments show that the proposed method achieves better performance than the existing approaches.

Date: Monday, 27 August 2018
Time: 3:00p.m. – 4:00p.m.
Venue: Room 4475, Academic Buildings (Lifts 25, 26), HKUST

All are welcome!