

Inverse Problems Network Meeting 2

Thursday, 23rd November 2017 - Friday, 24th November 2017

Isaac Newton Institute, Cambridge

Abstract of Talk

FAST DATA DRIVEN COMPRESSED SENSING (WITH APPLICATION TO COMPRESSED QUANTITATIVE MRI)

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We consider the problem of a class of compressed sensing with a data driven signal model. We show that fast reconstruction can be achieved through an inexact iterated projected gradient algorithm along with a cover tree data structure to enable fast nearest neighbor searches. We present both theoretical and numerical results showing that significant computational savings are possible through the use of inexact projections and a fast approximate nearest neighbor search. We then apply this to a novel form of MR imaging called Magnetic Resonance Fingerprinting (MRF) that enables direct estimation of the T1, T2 and proton density parameter maps for a patient through an undersampled k-space sampling and BLIP, a gradient projection algorithm that enforces the MR Bloch dynamics.