27th IFIP TC7 Conference 2015 on System Modelling and Optimization

Compressed Sensing and Medical Applications

Analysis ℓ_1-recovery with frames

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Abstract: The key assumption in the compressed sensing theory is that sparse signals can be recovered from what was previously believed to be incomplete information. In an analysis-based sparsity model one assumes that the application of a linear map to a signal of interest yields a vector with a large number of zero entries. In this talk we consider the case, when the analysis transform is given by inner products with respect to a possibly redundant frame. As reconstruction method we study a corresponding analysis ℓ_1-minimization approach and establish theoretical guarantees for successful recovery. Since it is hard to verify these conditions for deterministic measurements, we pass to random measurement maps and provide bounds on the number of measurements.