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Recovery of Compressively Sampled Signals Using Partial Support Information

In this talk, we discuss the recovery conditions of weighted ℓ_1 minimization for signal reconstruction from compressed sensing measurements when partial support information is available. We show that if at least 50% of the (partial) support information is accurate, then weighted ℓ_1 minimization is stable and robust under weaker conditions than the analogous conditions for standard ℓ_1 minimization. Moreover, weighted ℓ_1 minimization provides better bounds on the reconstruction error in terms of the measurement noise and the compressibility of the signal to be recovered. We illustrate our results with extensive numerical experiments on synthetic as well as audio and video signals.