

List of topics

Definitions and theorems from the lecture (including proofs):

1. Sparse vectors, compressible vectors, best s -term approximation
2. (P_0) , (P_1) , NP-complexity of (P_0) (definition, theorem)
3. Null Space Property, definition, $\text{NSP} \Leftrightarrow (P_1)$
4. Stable and Robust NSP - definitions
5. RIP, $\text{RIP} \implies \text{NSP}$
6. 2-stability of $\mathcal{N}(0, 1)$, concentration of measure
7. RIP for one fixed point, nets on the sphere
8. Gauss matrices have RIP
9. Lemma of Johnson and Lindenstrauss
10. Optimality of the number of measurements in the reconstruction of sparse vectors
11. Fast and discrete Fourier transform
12. Prony method - proof
13. Reconstruction of matrices with small rank from Gaussian measurements
14. (OMP), (CoSaMP), (IHT)