

Compressed Sensing and Discrete Optimization

The goal of this talk is to give an overview on compressed sensing from an discrete optimization/geometry point of view. The main problem in compressed sensing - the sparse representation problem - is to find the sparsest solutions of underdetermined linear equation systems. This problem is NP-hard, but can be solved by an LP if certain conditions are satisfied. The talk will review some well known conditions and show that they are NP-hard to check. The conditions can be approximated using SDPs or linear programs. Finally, some steps towards an exact solution of the original sparsest representation problem will be reviewed.