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*"La mente è come un paracadute.
Funziona solo se si apre"
A. Einstein*

Compressed Sensing and Discrete Optimization

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Abstract

The goal of this talk is to give an overview on compressed sensing from a discrete optimization/geometry point of view. This area has received a lot of attention recently, e.g., in signal processing, bioinformatics, etc. 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 a linear program 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 semi-definite or linear programs. Finally, some steps towards an exact solution of the original sparsest representation problem will be reviewed.