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**SEMINARIO**

**OPTIMIZATION AND EQUILIBRIUM**

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**Titulo**

# Hidden Convexity in the l0 Pseudonorm and Lower Bound Convex Programs for Exact Sparse Optimization

**Abstract:**

In sparse optimization problems, one looks for solution that have few nonzero components.
We consider problems where sparsity is exactly measured by the l0 pseudonorm. We display a suitable conjugacy for which we show that the l0 pseudonorm is equal to its biconjugate.
As a corollary, we obtain that the (nonconvex) l0 pseudonorm coincides, on the sphere, with a convex lsc function that we characterize.

With this conjugacy, we display a lower bound for the original exact sparse optimization problem, which is a convex minimization program over the unit ball of a so-called support norm.

Finally, we introduce generalized sparse optimization, where the solution is searched among a finite union of subsets. We provide a systematic way to design norms and lower bound convex minimization programs over their unit ball. Thus, we recover most of the sparsity-inducing norms used in machine learning.

Miércoles 19 de junio a las 16:00 hrs, Sala de Seminarios John Von Neumann CMM, Beauchef 851, Torre Norte, Piso 7.

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