

Computer Science/Discrete Mathematics Seminar II

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Sparsity Lower Bounds for Dimensionality Reducing Maps

Series: Computer Science/Discrete Mathematics

Jelani Nelson

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Date & Time: Tue, 01/22/2013 - 10:30 - 12:30

Location: S-101

Video Link:

<http://video.ias.edu/1213/csdm/0122-jelaniNelson>

Abstract: We give near-tight lower bounds for the sparsity required in several dimensionality reducing linear maps. In particular, we show: (1) The sparsity achieved by [Kane-Nelson, SODA 2012] in the sparse Johnson-Lindenstrauss lemma is optimal up to a $\log(1/\epsilon)$ factor. (2) RIP₂ matrices preserving k -space vectors in \mathbb{R}^n with the optimal number of rows must be dense as long as $k < n / \text{polylog}(n)$. (3) Any oblivious subspace embedding with 1 non-zero entry per column and preserving d -dimensional subspaces in \mathbb{R}^n must have $\Omega(d^2)$ rows, matching an upper bound of [Nelson-Nguyen, 2012] for constant distortion. Joint work with Huy Lê Nguyen (Princeton).

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terms:

- [CSDM Seminars](#)