מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Geometric Functional Analysis and Probability Seminar

Room 155 ,Ziskind Building
on Thursday, Dec 27, 2018
at 13:30

Yury Makarychev
TTIC Chicago

Performance of Johnson-Lindenstrauss Transform for k-Means and k-Medians Clustering

Abstract:

Consider an instance of Euclidean k-means or k-medians clustering. We show that the cost of the optimal solution is preserved up to a factor of $(1+\epsilon)$ under a projection onto a random $O(log(k/\epsilon)/\epsilon^2)$-dimensional subspace whp. Further, the cost of every clustering is preserved within $(1+\epsilon)$. Crucially, the dimension does not depend on the total number of points n in the instance. Additionally, our result applies to Euclidean k-clustering with the distances raised to the p-th power for any constant p.

For k-means, our result resolves an open problem posed by Cohen, Elder, Musco, Musco, and Persu (STOC 2015); for k-medians, it answers a question raised by Kannan.

Joint work with Konstantin Makarychev and Ilya Razenshteyn.

Email: efrat.levitsky@weizmann.ac.il * Phone: (08)9343349 * Fax: (08)9344308