מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Geometric Functional Analysis and Probability Seminar

Room 290C ,Ziskind Building
on Thursday, Nov 17, 2016
at 11:00

Anirban Basak
Weizmann Institute of Science

Invertibility of sparse random matrices

Abstract:

We consider a class of sparse random matrices of the form $A_n =(\xi_{i,j}\delta_{i,j})_{i,j=1}^n$, where $\{\xi_{i,j}\}$ are i.i.d.~centered random variables, and $\{\delta_{i,j}\}$ are i.i.d.~Bernoulli random variables taking value 1 with probability p_n, and prove a quantitative estimate on the smallest singular value for $p_n = \Omega(\frac{\log n}{n})$, under a suitable assumption on the spectral norm of the matrices. This establishes the invertibility of a large class of sparse matrices. We also find quantitative estimates on the smallest singular value of the adjacency matrix of a directed Erdos-Reyni graph whenever its edge connectivity probability is above the critical threshold $\Omega(\frac{\log n}{n})$. This is joint work with Mark Rudelson.

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