
* Princeton Discrete Math Seminar *

Date: Wednesday, March 2, 2:15 in Fine Hall 224

Adriana Karagiozova
Princeton University

A Tight Threshold for Metric Ramsey Phenomena

Abstract

We examine the metric Ramsey problem for the normed spaces l_p . Given parameters $p \geq 1, \alpha \geq 1$ and an integer n , we ask for the largest m such that every n -point metric space contains an m -point subspace which embeds into l_p with distortion at most α . Bartal, Linial, Mendel and Naor showed in '03 that in the case of $1 \leq p \leq 2$, the dependence of m on α undergoes a phase transition at $\alpha = 2$. The case of $p > 2$ was left as an open problem. We show that the phase transition occurs around $\alpha = 2$ for all $p \geq 1$. The basis of our result is a proof that there exist metrics with distances in $\{0, 1, 2\}$ which require distortion arbitrarily close to 2 for embedding into l_p . In the process we develop new tools for analysing embeddings of random metrics into l_p .

This is joint work with Moses Charikar.