Summer School 2026

Topics in Banach Space Theory

Dimension vs separation: how to get a partition in an infinite dimensional metric space

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Abstract

A metric space has finite separation modulus if, for every D>0, it is possible to find a probability distribution over the D-bounded partitions of the space such that points that are close have low (linear with the distance) probability of belonging to different clusters of the partition. This property has been intensively used in metric geometry and computer science since Bartal introduced it in 1998. Naor and Silberman proved in 2011 that a metric space with finite Nagata dimension has finite separation modulus, but the reverse implication remained unknown. In this talk we will find an example of a metric space with infinite Nagata dimension but finite separation modulus, concluding that the reverse implication of the latter result does not hold. A consequence for Lipschitz-free spaces will also be derived.