

Least Euclidean Distortion Embeddings of Flat Tori

Arne Heimendahl

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Abstract

Low distortion embeddings play an important role in many approximation algorithms. The goal is to embed a "difficult" metric space into another simpler metric space (such as Hilbert space), in a way that approximately preserves distances. In this talk we will consider low distortion embeddings of flat tori \mathbb{R}^n/L , where L is an n -dimensional lattice. We will show how least Euclidean distortion embeddings of flat tori can be computed by an infinite-dimensional semidefinite program. Based on the semidefinite program, we will derive some interesting results on the structure of least Euclidean distortion embeddings. Additionally, we will analyze how existing embeddings from literature (Haviv, Regev, 2010) fit into this framework and how their distortion can be improved. Joint work with Moritz Lücke, Frank Vallentin and Marc Zimmermann.