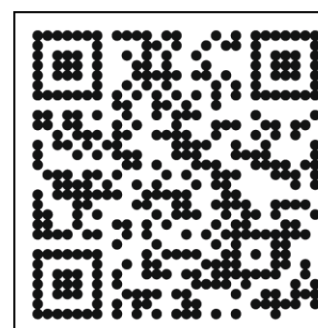




Abelian Cayley High-Dimensional Expanders



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Abstract

Expansion is a property of graphs that captures strong connectivity and rapid mixing of random walks. High-dimensional expanders (HDXs) generalize this notion to simplicial complexes, with applications in sampling, agreement testing, probabilistically checkable proofs, and error-correcting codes. Many classical HDX constructions rely on sophisticated algebraic structures. Abelian Cayley constructions offer a more concrete framework based on additive relations and linear algebra, making several aspects of the construction easier to describe and analyze.

In this talk, I will introduce the basic definitions and applications of expanders and high-dimensional expanders, then present a general framework for constructing abelian Cayley HDXs and discuss a series of recent results within this framework.

Biography

Songtao Mao(毛松涛) is a Ph.D. student in Computer Science at Johns Hopkins University, advised by Professor Xin Li. He received his bachelor's degree in mathematics from Zhiyuan College at Shanghai Jiao Tong University. His research interests include pseudorandomness, coding theory, average-case complexity, and cryptography.