



HARVARD UNIVERSITY
17 Oxford Street
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Mathematical Picture Language Seminar

Tuesday, December 3

4:30 p.m. Boston time

Jefferson 356 and Zoom



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Quantum error-correcting codes, systolic geometry, and quantitative embeddings

Abstract: There have been several recent breakthroughs constructing good quantum codes which have n qubits with distance d and dimension k . However, these codes cannot be implemented in 3 dimensions - there is no way to place the qubits on a lattice so that every check only involves the qubits in some small ball. Bravyi and Terhal have shown that such 3d codes with n qubits can have distance at most d and dimension at most k , given that distance. In this talk I'll discuss how to construct 3d codes with parameters that match these bounds. This relies on the known good codes, a connection between codes and systolic geometry made by Freedman-Hastings, and a quantitative embedding theorem.



Zoom QR Code & Link:

<https://harvard.zoom.us/j/779283357?pwd=MitXVm1pYUJJVzZqT3lwV2pCT1ZUQTog>

Passcode: 657361

<https://mathpicture.fas.harvard.edu/seminar>