

An application of the Expander Mixing Lemma

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This talk was motivated by a key problem in computational group theory, namely recognising classical groups. I shall briefly review techniques in algebraic graph theory before introducing the expander mixing lemma. The expander mixing lemma can be used to establish a very delicate inequality involving a geometric problem needed for classical group recognition. The problem is to find a lower bound for the proportion of pairs of complementary non-degenerate subspaces of prescribed dimensions. Once the eigenvalues are known, the computation is straightforward, but finding the eigenvalues involves the representation theory of the symmetric group. This is joint work with Ferdinand Ihringer and Sam Mattheus. For more details, see the preprint [1].

[1] S. P. Glasby, Ferdinand Ihringer and Sam Mattheus, The proportion of non-degenerate complementary subspaces in classical spaces. arXiv:2207.04678