Thesis Direction

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Currently, the thesis loosely focuses on "Spectral Statistics of Random Matrices". To narrow down our focus, this document will outline and organize the potential avenues of focus.

Stochastic Matrices

Stochastic matrices are ergodic if they have a limiting distribution that is also the stationary distribution. This is achieved when the matrix represents a Markov chain that is aperiodic and irreducible.

- Does anything change when the matrix is symmetric?

Erdos-Renyi Graphs

Walks on an ERG represent a parameterizable class of stochastic matrices. Specifically, we can parameterize its sparsity or connectedness with a parameter p. We wish to study the following:

- How does p impact the mixing time of the related Markov Chain?
- How does p impact the spectrum of the related matrix ensemble?

Normal Matrices

For normal matrices, we study a hidden markov chain in the CRS. For this, we also ask:

- How do the parameters of the ensemble affect mixing time?
- What properties exist in the entries of the CRS? Are there any gurantees with normal matrices?
- Does anything change when the matrix is symmetric?

Band Matrices

- What about band matrices? (e.g. tridiagonal normal)