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*The Spectral Gap of Iterative Complex Networks*

Complex Networks appear in applications all around us, from the internet to social networks. These networks exhibit a range of similar properties including large scale, power-law degree distribution, and small-world properties. Studying the *spectral gap* of complex networks reveals an understanding of the underlying community structures. We will explore the spectral gap of iterated models for complex networks. In these models, each subsequent graph is created through a deterministic generation algorithm, where nodes are cloned and preserve either in-group or out-group relationships. Furthermore, we will define the generalized model of the Iterative Independent Model, specifically exploring the spectral gap of graphs in this model.