**[Graph Generation via Scattering](https://openreview.net/forum?id=HyxSBh09t7)**

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* **Abstract:** Generative networks have made it possible to generate meaningful signals such as images and texts from simple noise. Recently, generative methods based on GAN and VAE were developed for graphs and graph signals. However, the mathematical properties of these methods are unclear, and training good generative models is difficult. This work proposes a graph generation model that uses a recent adaptation of Mallat's scattering transform to graphs. The proposed model is naturally composed of an encoder and a decoder. The encoder is a Gaussianized graph scattering transform, which is robust to signal and graph manipulation. The decoder is a simple fully connected network that is adapted to specific tasks, such as link prediction, signal generation on graphs and full graph and signal generation. The training of our proposed system is efficient since it is only applied to the decoder and the hardware requirement is moderate. Numerical results demonstrate state-of-the-art performance of the proposed system for both link prediction and graph and signal generation. These results are in contrast to experience with Euclidean data, where it is difficult to form a generative scattering network that performs as well as state-of-the-art methods. We believe that this is because of the discrete and simpler nature of graph applications, unlike the more complex and high-frequency nature of Euclidean data, in particular, of some natural images.
* **Keywords:** graph generative neural network, link prediction, graph and signal generation, scattering network
* **TL;DR:** This work proposes a graph generation system based on scattering and demonstrates competitive performance as well as indicates better promise of the generative scattering framework to datasets with a graph structure.

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