Empirical analysis of variants for random graph generators

<u>Description:</u> *Many real-world systems—ranging from social and information networks to biological interactions — can be represented as directed graphs whose connectivity patterns often exhibit scale-free behavior. This project aims to develop and analyze a probabilistic model for generating scale-free directed graphs, possibly building on existing frameworks.*
The goal is to first develop and implement a variant of a method to randomly generate scale-free directed graphs, before carrying out an empirical statistical investigation of the resulting networks. Key quantities of interest include degree distributions, connectivity and path-length properties, clustering/modularity, among other structural indicators. The project combines mathematical modeling with computational experimentation and offers opportunities for both theoretical insights and applied statistical analysis.