

Preferential Attachment

Large Scale Distributed Systems

Graphs formed by random preferential attachment will exhibit *hub nodes* that have significantly more connections than other nodes. In these graphs the degree distribution forms a power law. Such graphs can be formed by biasing the probability of choosing a given edge target by the degree of that target.

This task should derive preferential attachment graphs for growing numbers of initial vertices and see how that influences the creation of a single connected component. To check that each graph is correct, create plots of each final graph's degree distribution to check for power law signature.

Recommended tools:

- Python
- NetworkX. <https://networkx.github.io>
- Gnuplot, matplotlib, or similar graphing tools with PDF outputs
- NetLogo. <https://ccl.northwestern.edu/netlogo/>