

CptS 591: Elements of Network Science, Spring 2021

Basic Network Properties

Lecture Summary

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Degree

- Definition, Directed vs Undirected graphs, Average Degree
- Degree distribution
 - Most real-world networks have Power-Law degree distribution
- Real-world networks are sparse

Distance

- Network diameter
- Average path length
- Distribution of path length
 - Most real-world networks have bell-shaped path length distribution

Clustering Coefficient

- Global clustering coefficient
- Local clustering coefficient
 - relationship to degrees
 - relationship to ‘structural holes’
 - * Bad thing: e.g. information flow, traffic
 - * Good thing: when measuring importance/influence

Networks and Adjacency Matrices

- Directed vs Undirected networks case
- Interpretation of degrees in matrix terms
- Connectedness and adjacency matrices
- Interpretation of distance in matrix terms