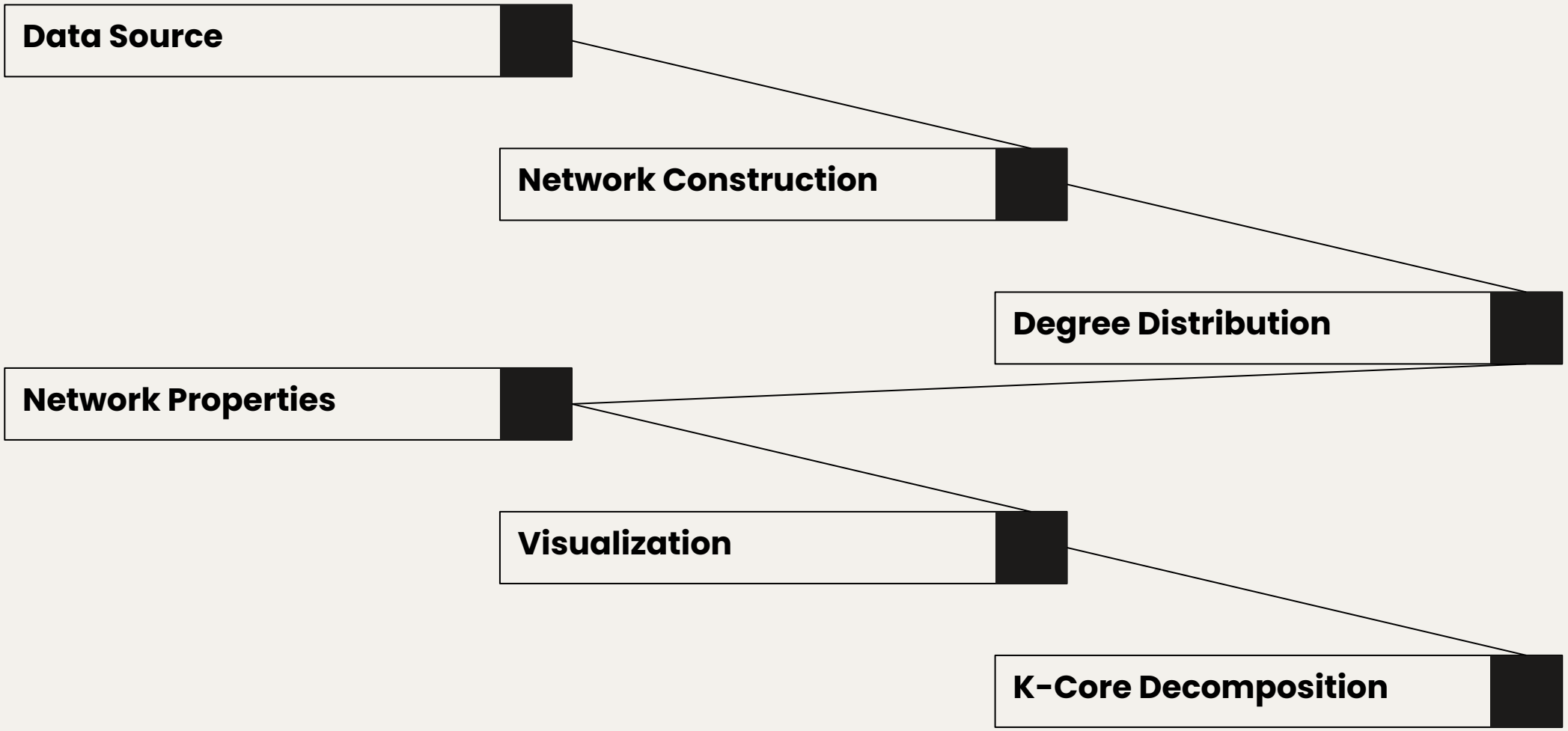
Complex Network Analysis of Global Conflicts

Matthew Prest

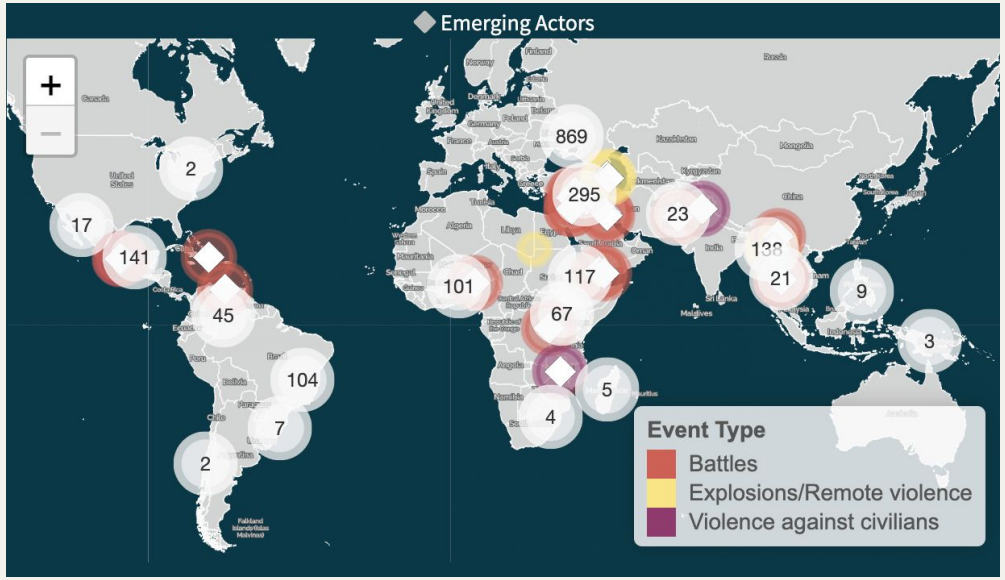
Overview



Primary Data Source

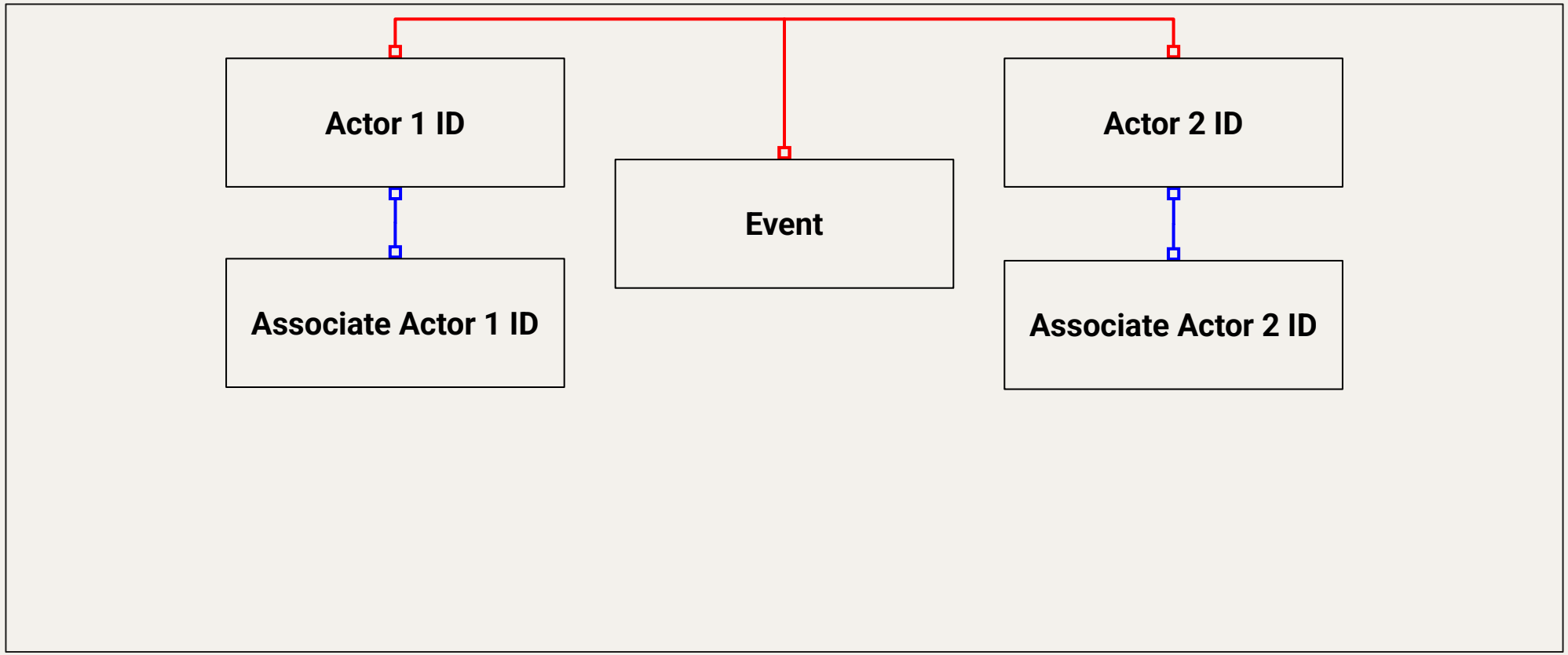
Armed Conflict Location Event Data

- International, non-aligned, non-profit, living database of global armed conflicts, crises and civil unrest
- Widely used by UN, IMF, WHO, Governments etc
- Each event tagged with actors & assisting actors

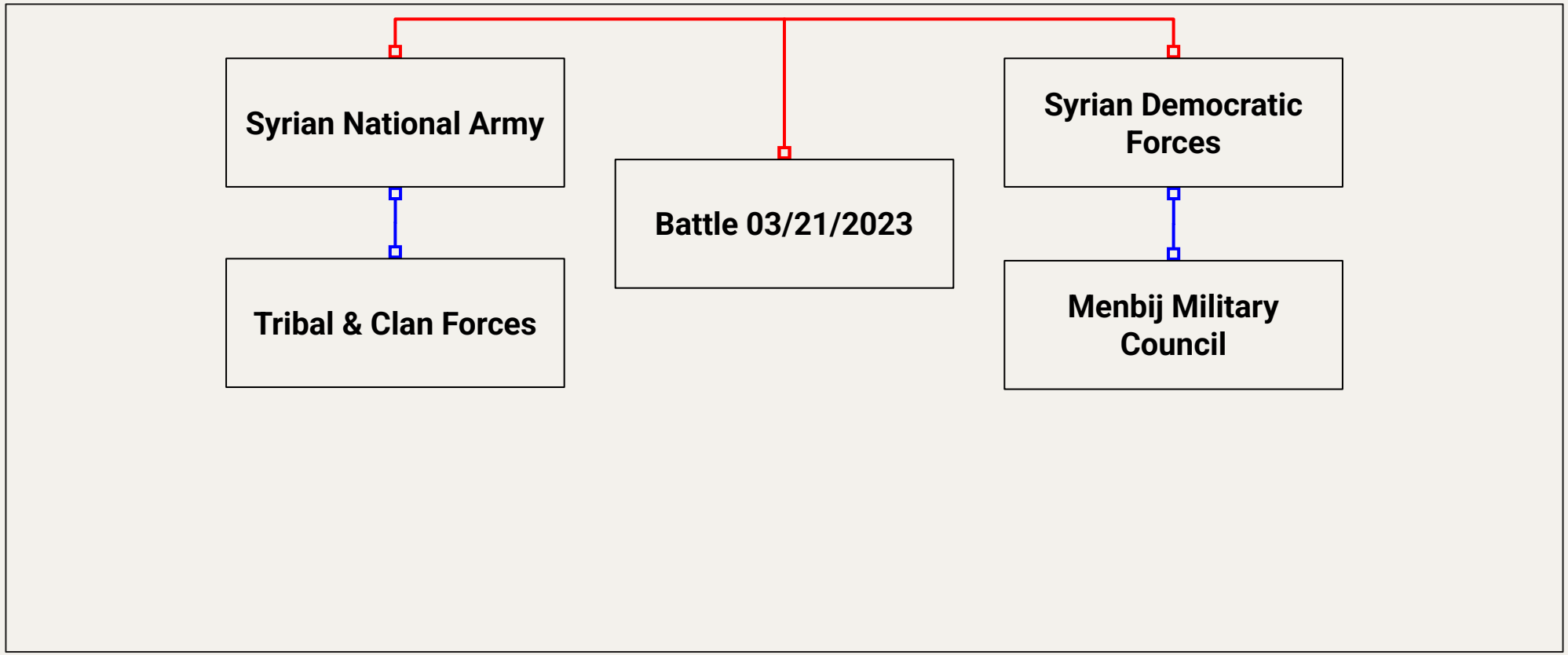


ACLED

Actors & Associate Actors



Example



Constructing Networks

Middle East Region

- Allies Network: nodes represent actors, edges are created by events in which actors are allied
- Enemies Network: nodes represent actors, edges are created by events in which actors are NOT allied
- Network Size: 7989

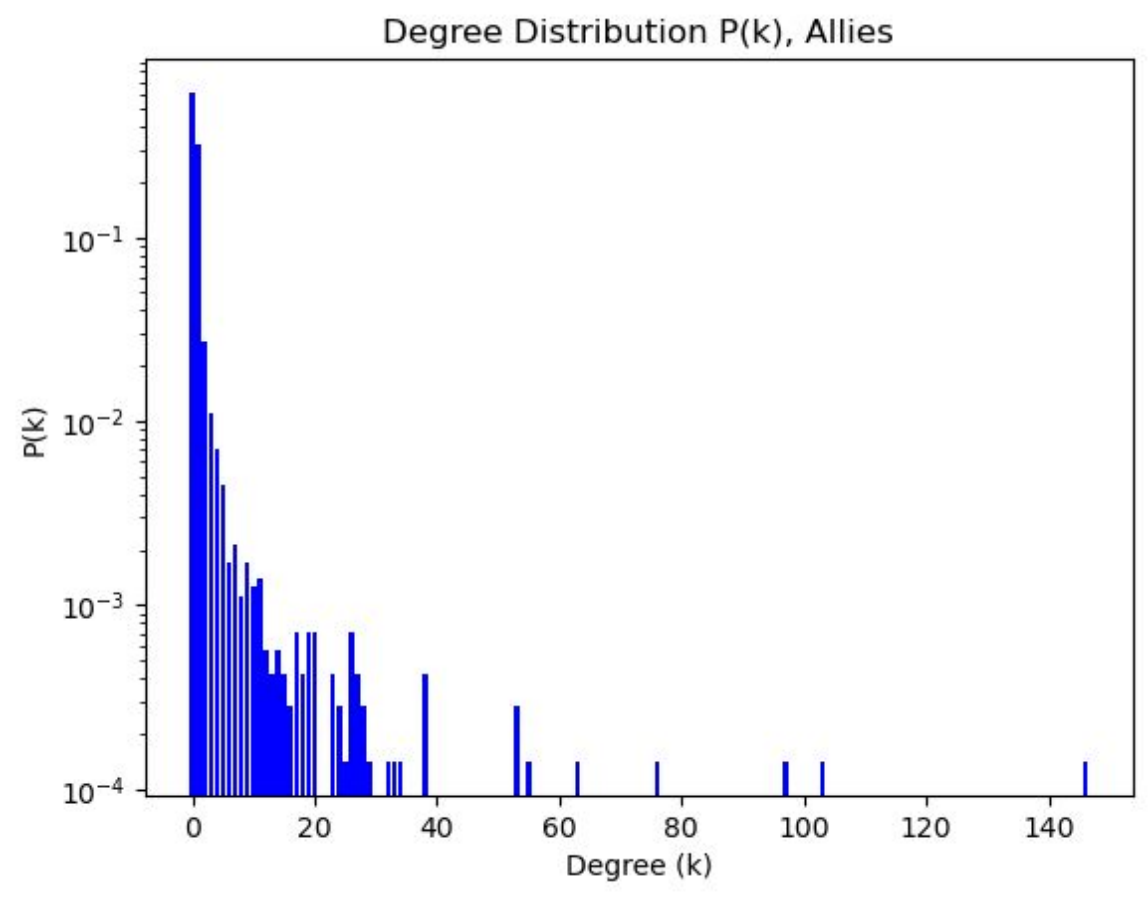
Hypothesis

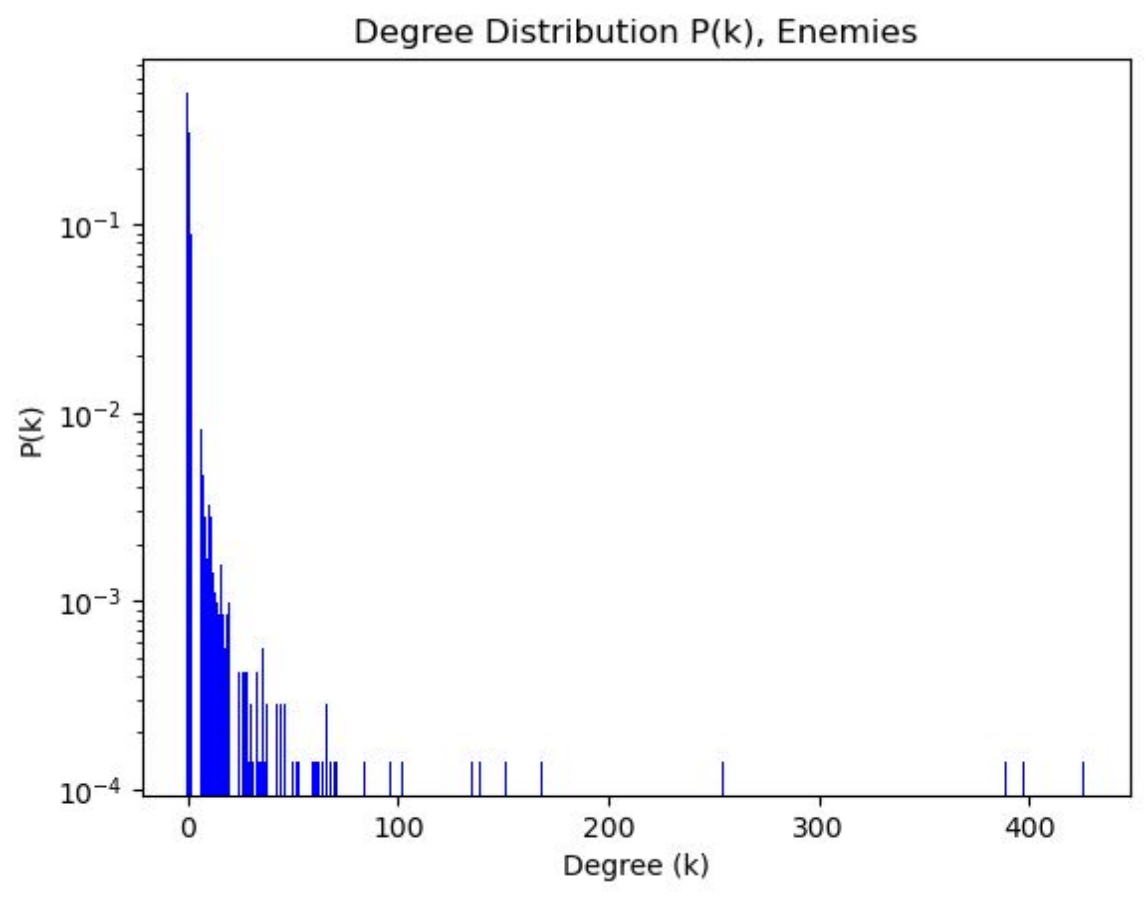
- International Relations - Alliance Theory

  Alliances form bilaterally in response to threats

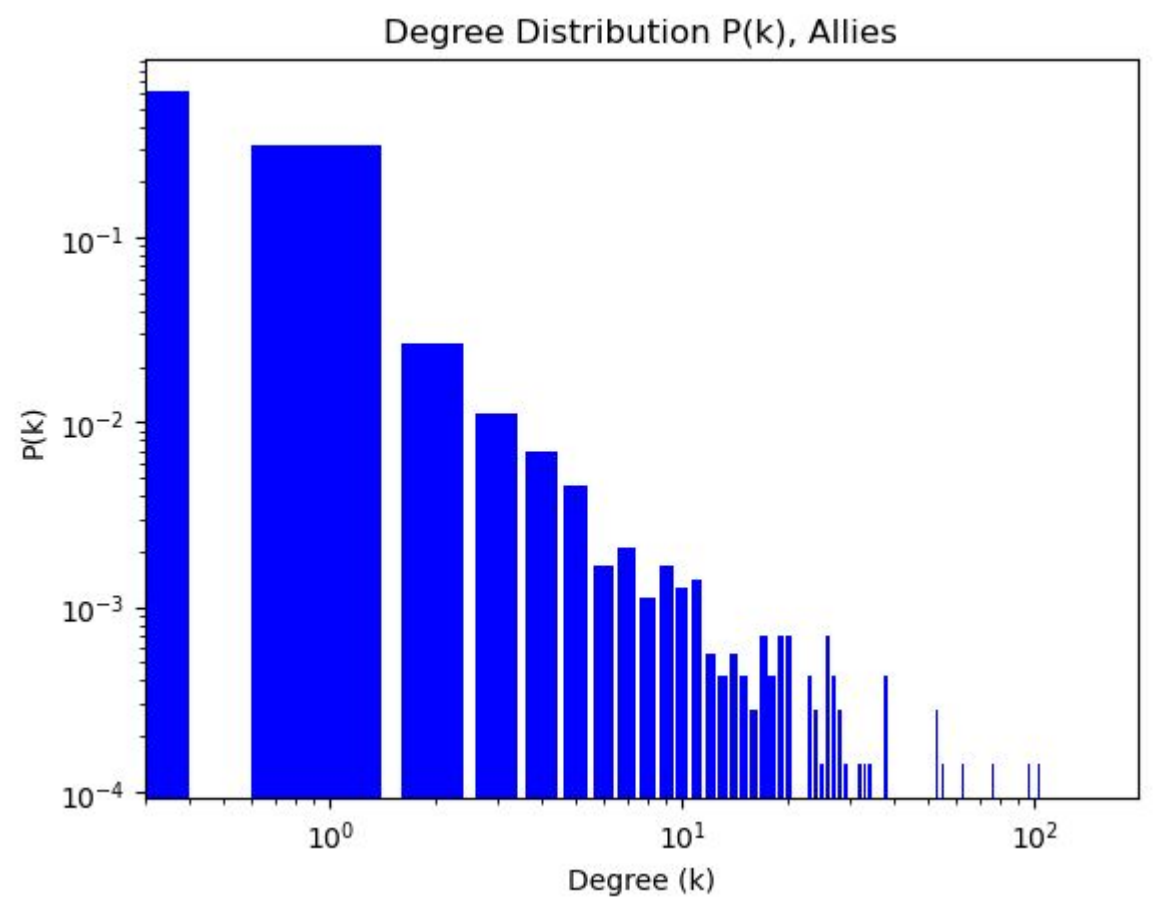
How do the network properties of Allies and Enemies in ME conflicts compare?

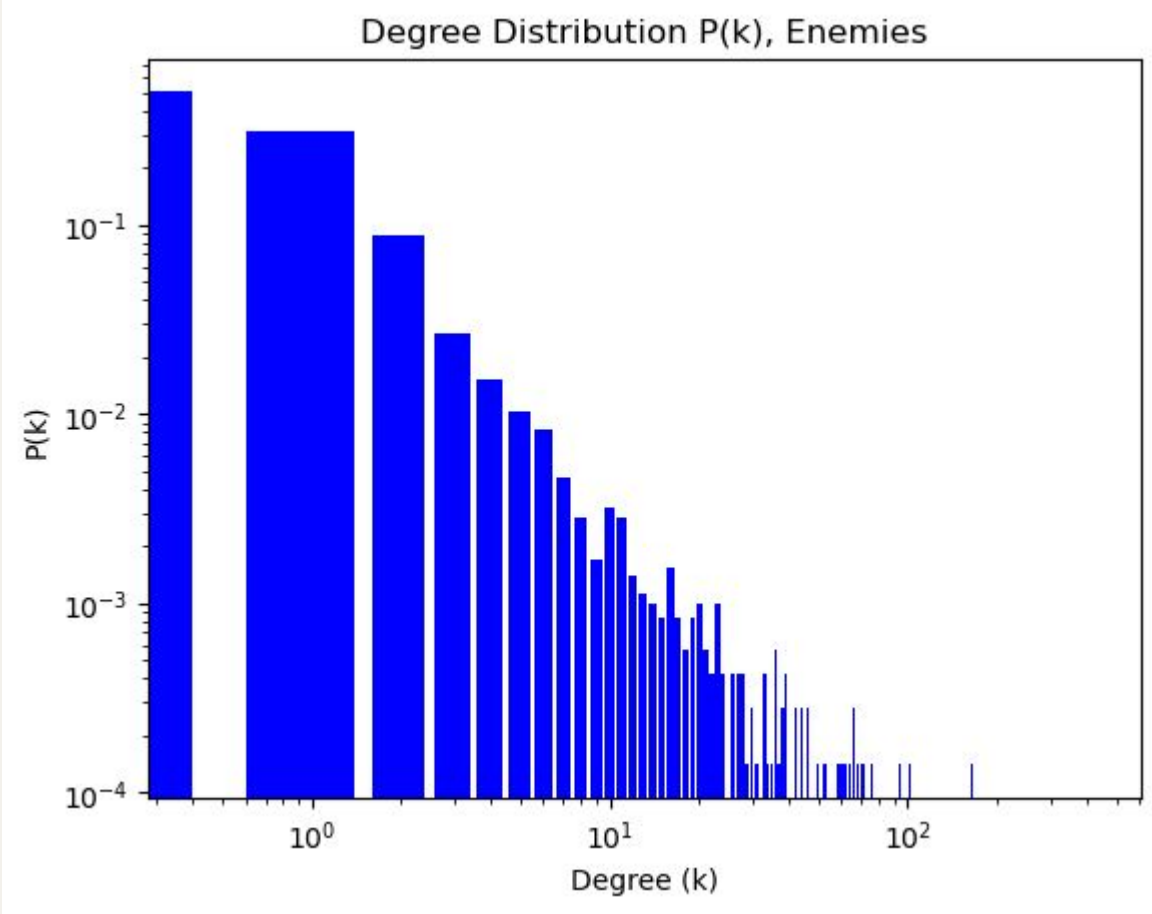
Degree Distributions



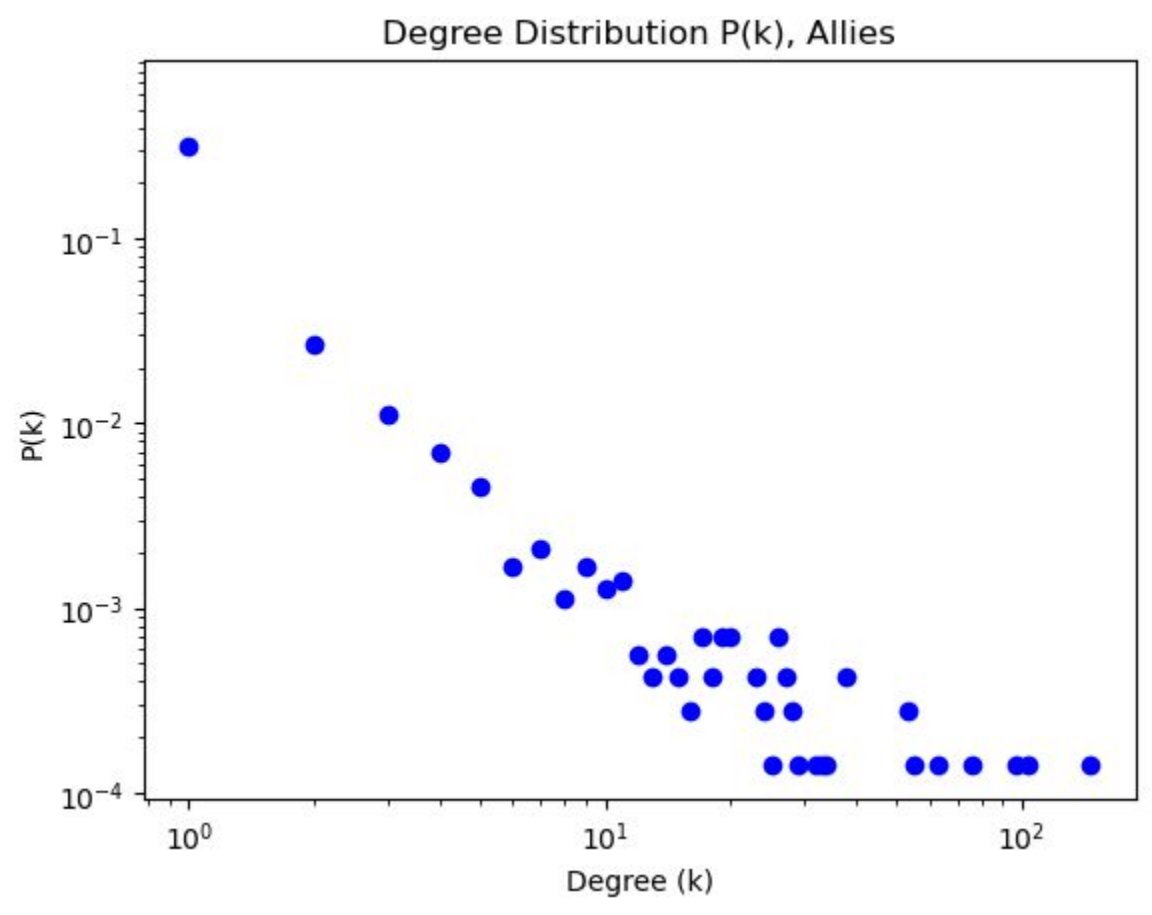


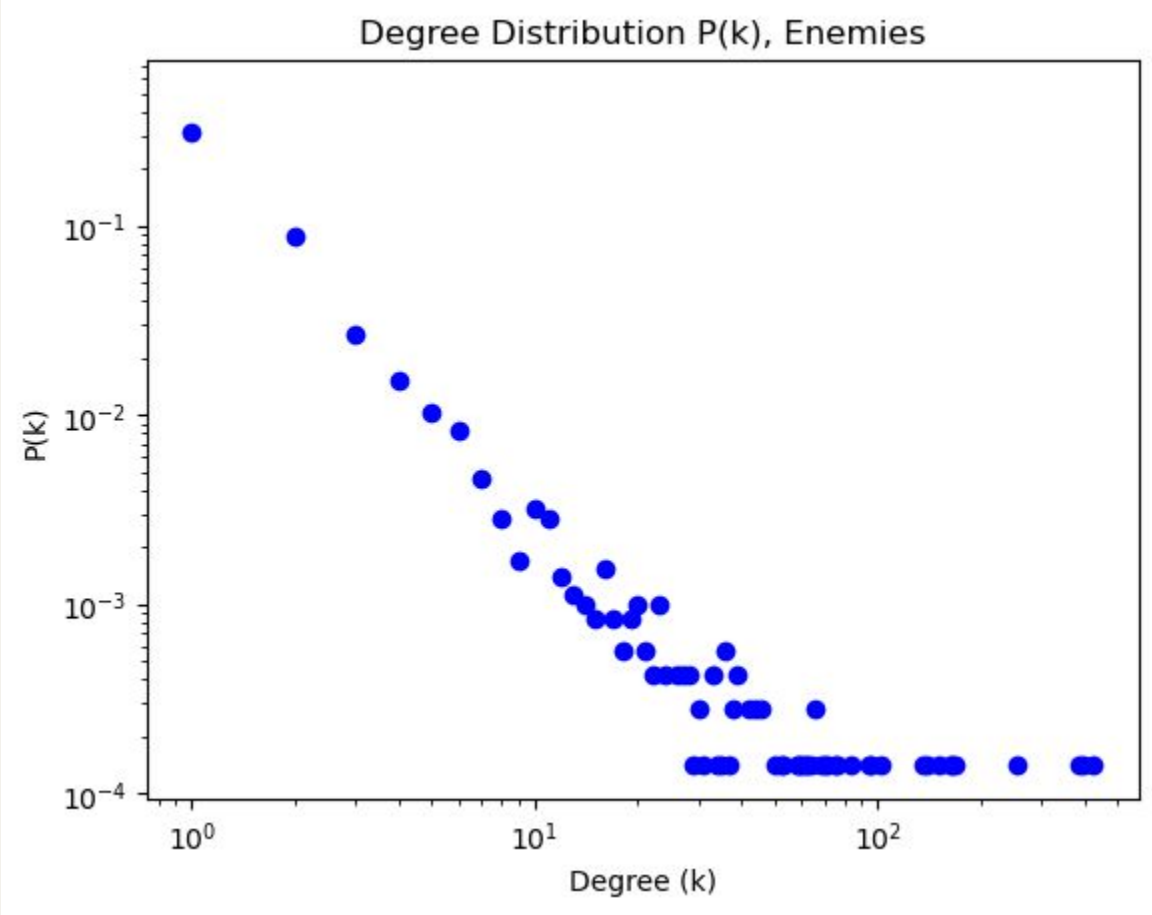
Log – Log Bar



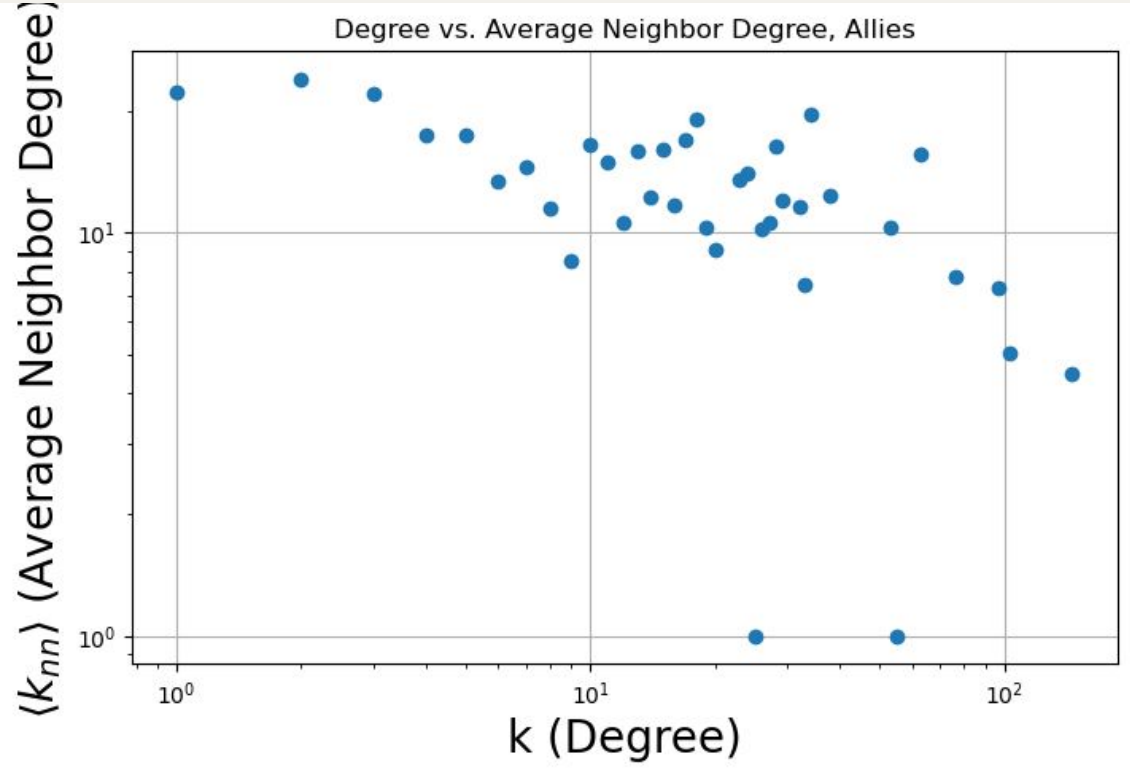


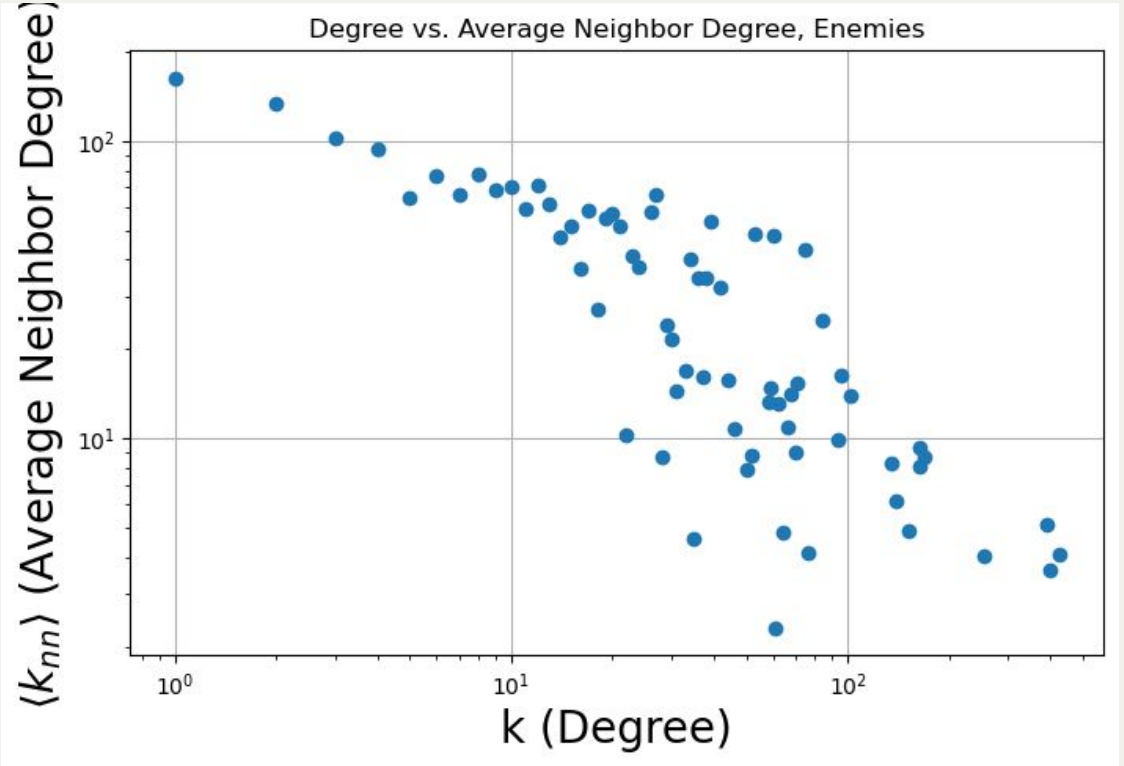
Log - Log Scatter

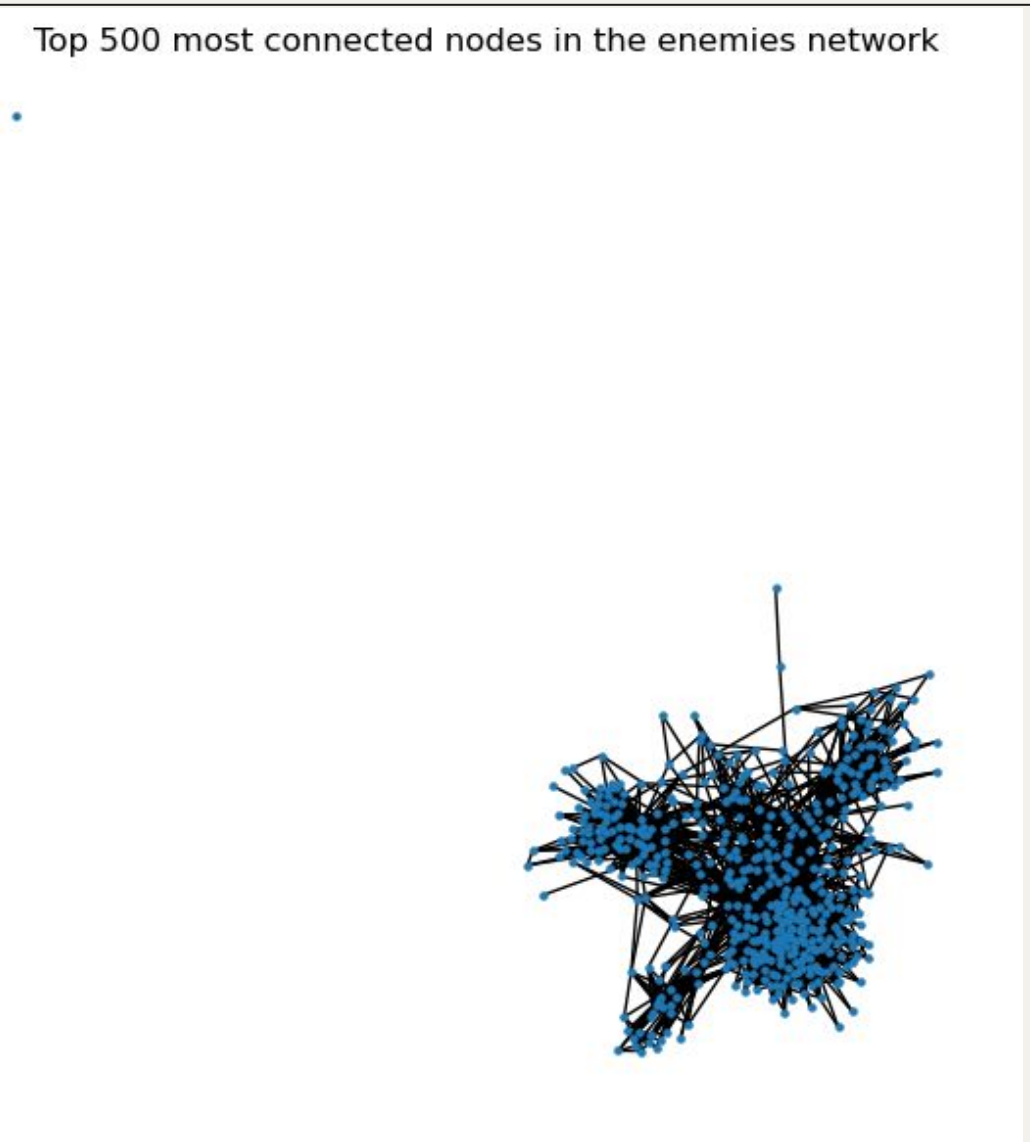




Average Neighbour Degree



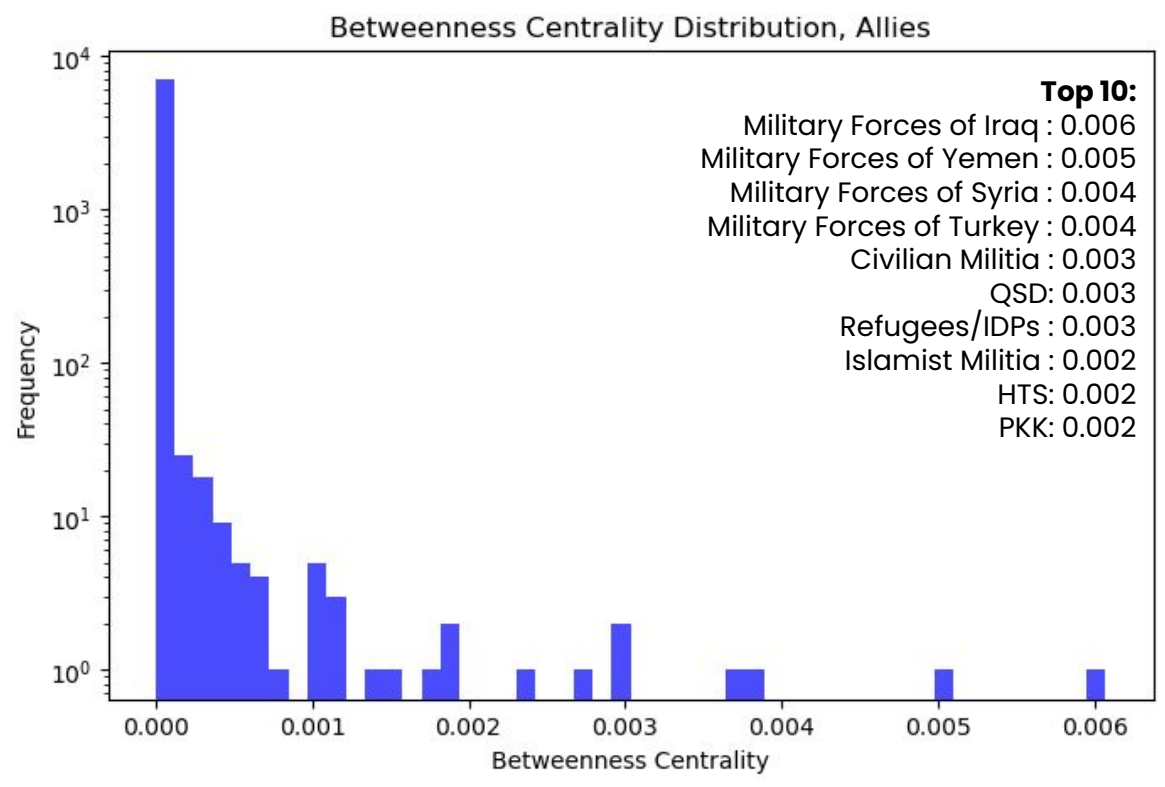


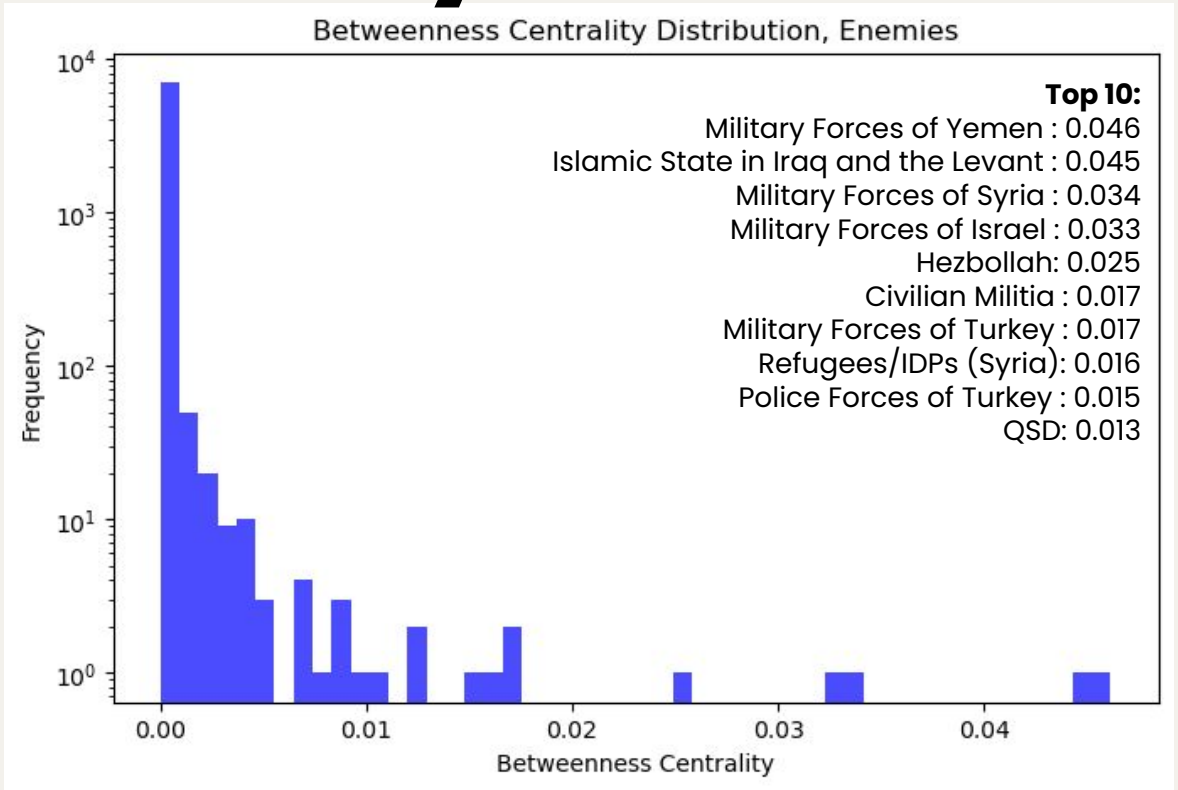


Average Clustering Coefficient: 0.0188

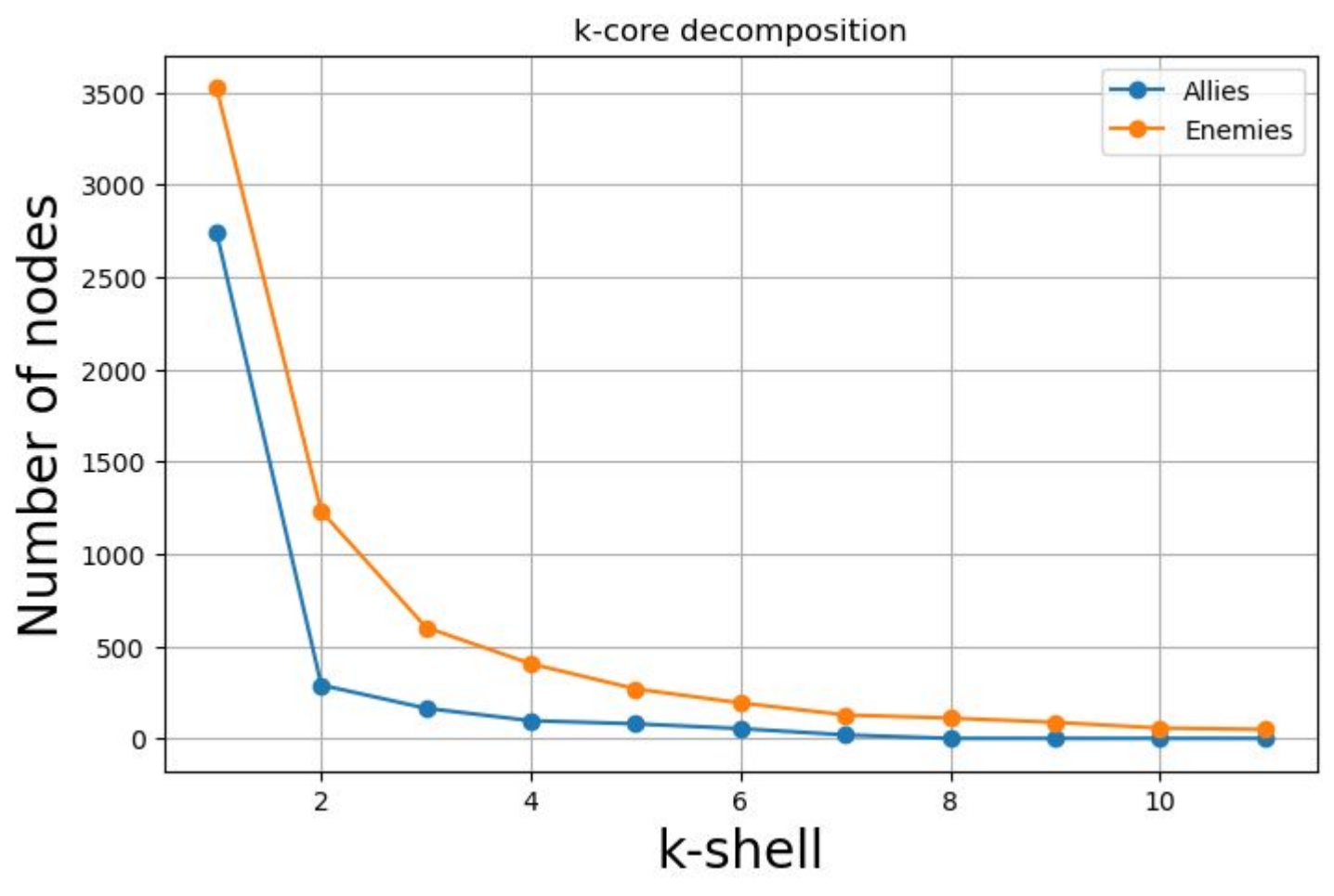
Average Clustering Coefficient: 0.0191

Betweenness Centrality





K-Shell Decomposition



Citations

- Packages: Pandas, Numpy, Matplotlib, Networkx, powerlaw, scipy
- ACLED ME Dataset
- Presentation Template: SlidesMania