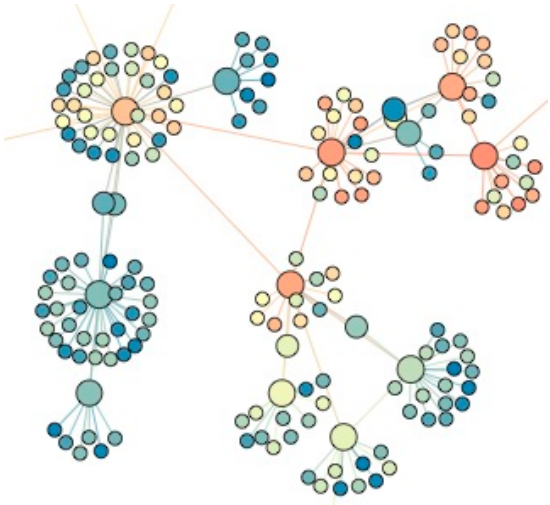
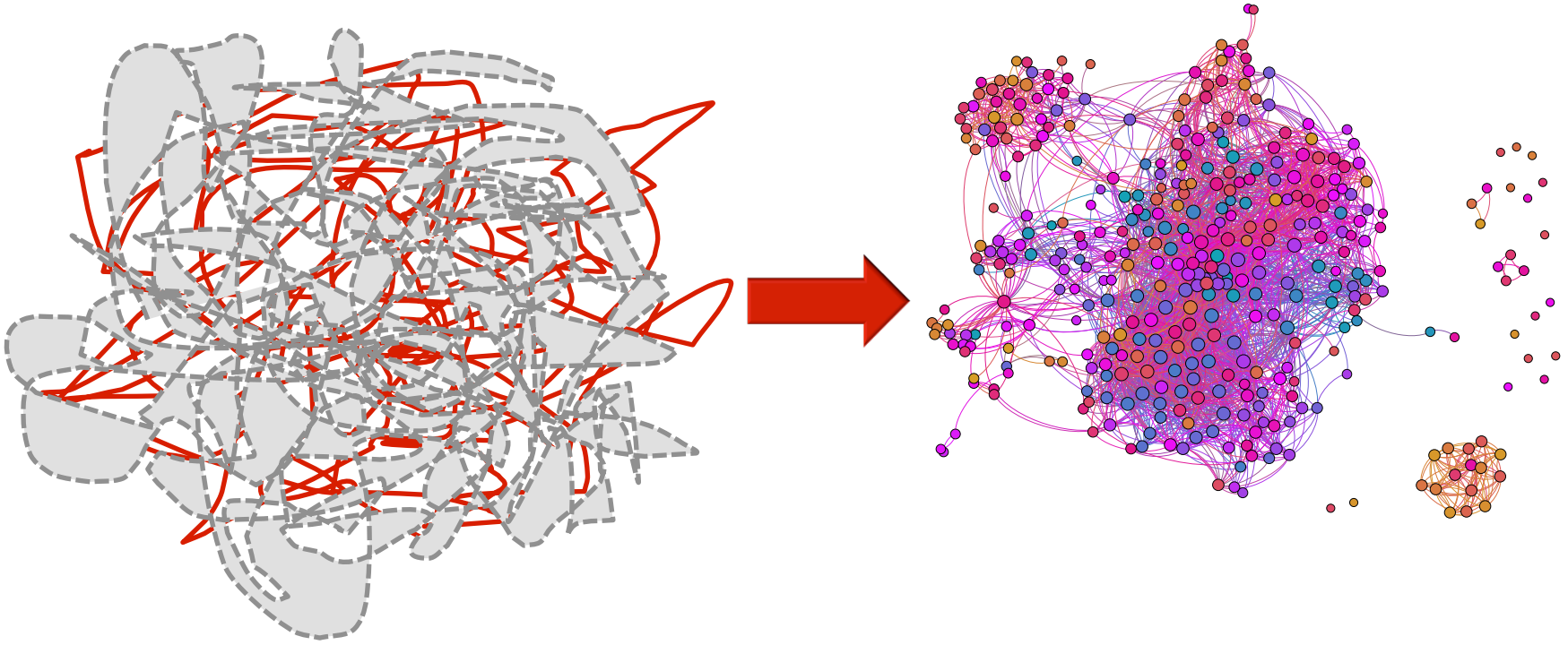


Social Network Analysis

Lada Adamic

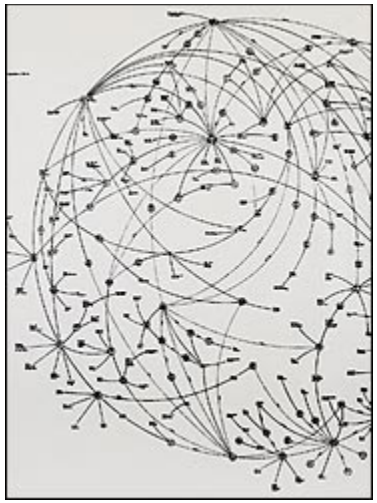
school of information

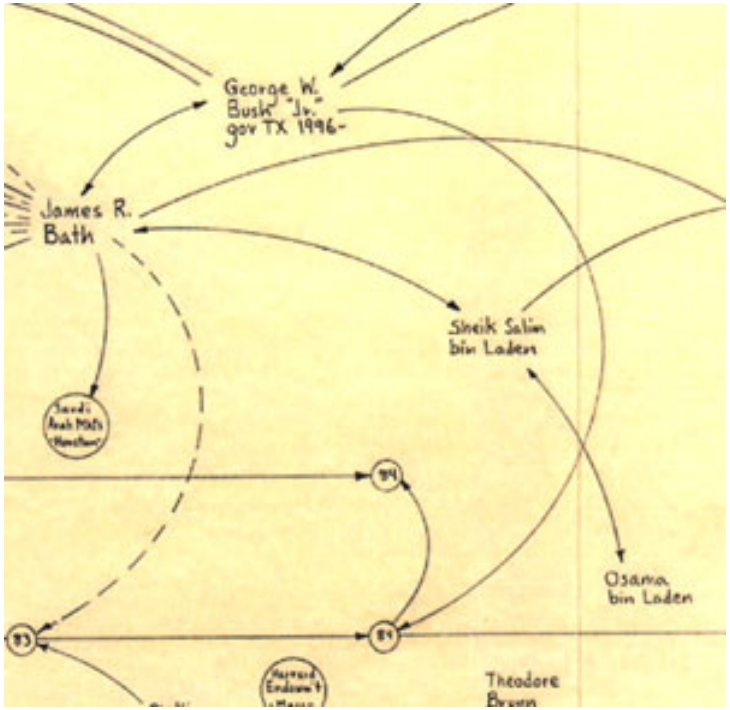
What do we get out of studying systems as networks?



examples: Political/Financial Networks

- Mark Lombardi: tracked and mapped global financial fiascos in the 1980s and 1990s from public sources such as news articles





Understanding through visualization

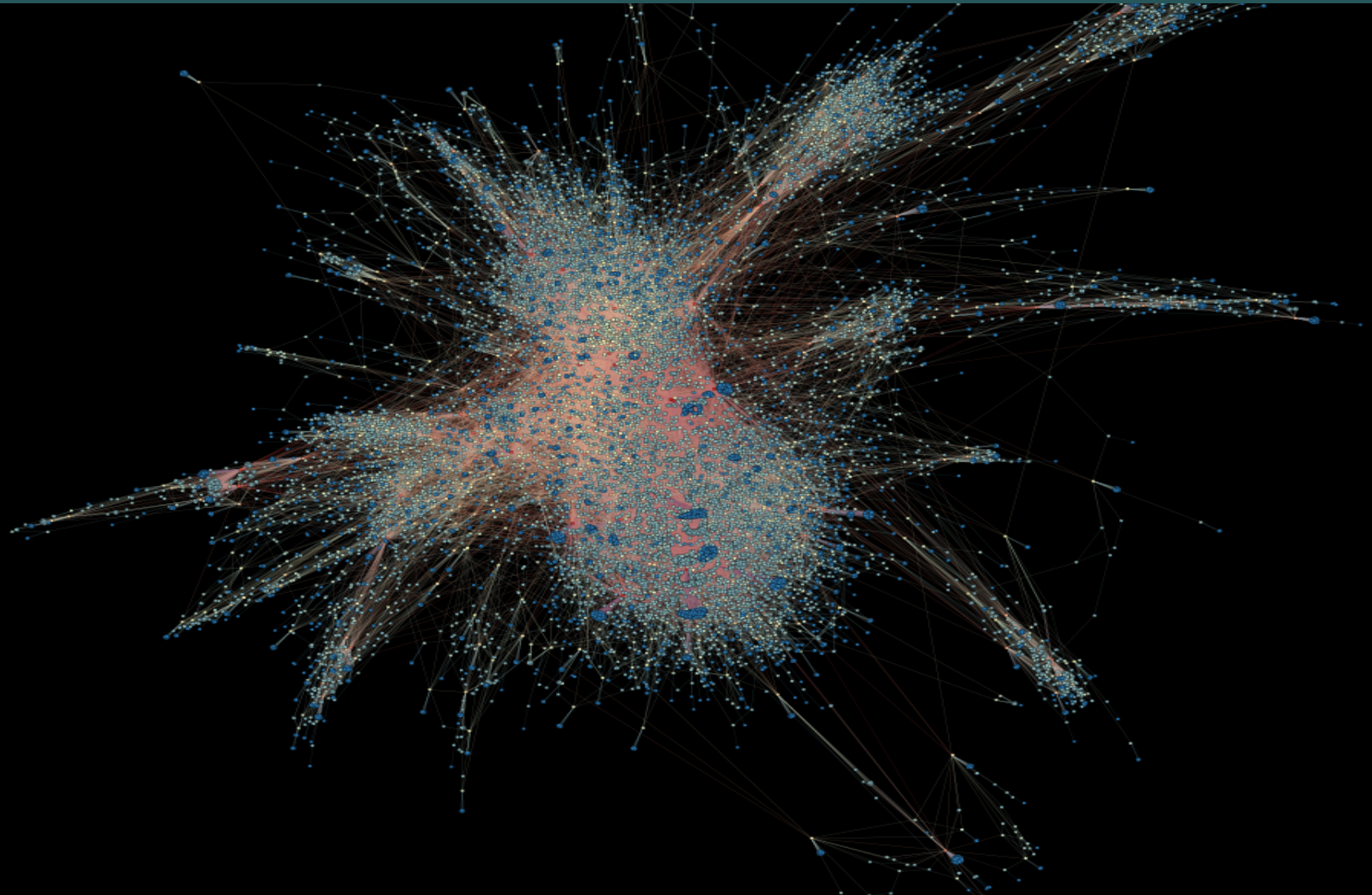
- “I happened to be in the Drawing Center when the Lombardi show was being installed and several consultants to the Department of Homeland Security came in to take a look. They said they found the work revelatory, not because the financial and political connections he mapped were new to them, but because Lombardi showed them an elegant way to array disparate information and make sense of things, which they thought might be useful to their security efforts. I didn‘t know whether to find that response comforting or alarming, but I saw exactly what they meant.”

  Michael Kimmelman

  Webs Connecting the Power Brokers, the Money and the World

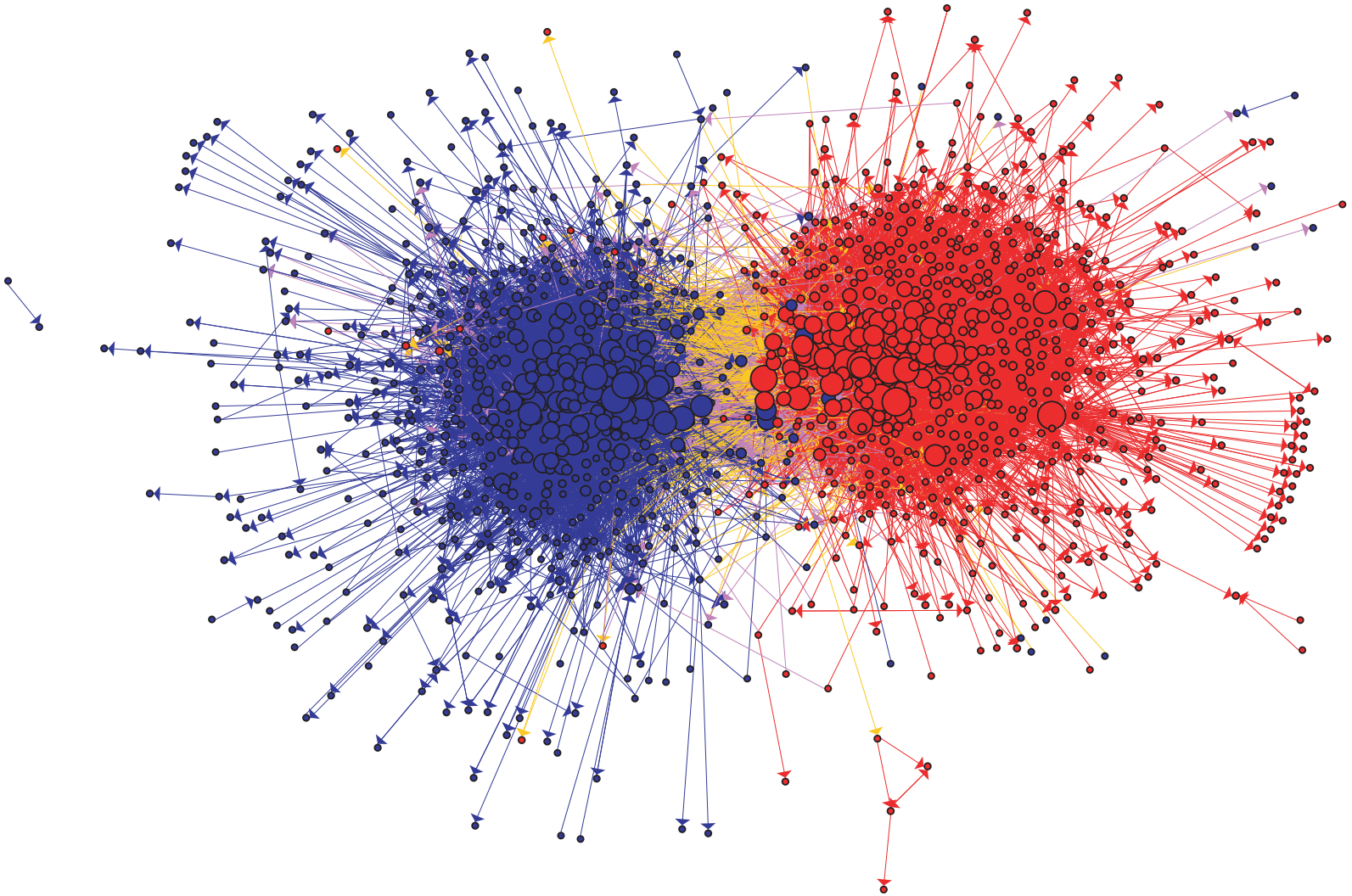
  NY Times November 14, 2003

Internet

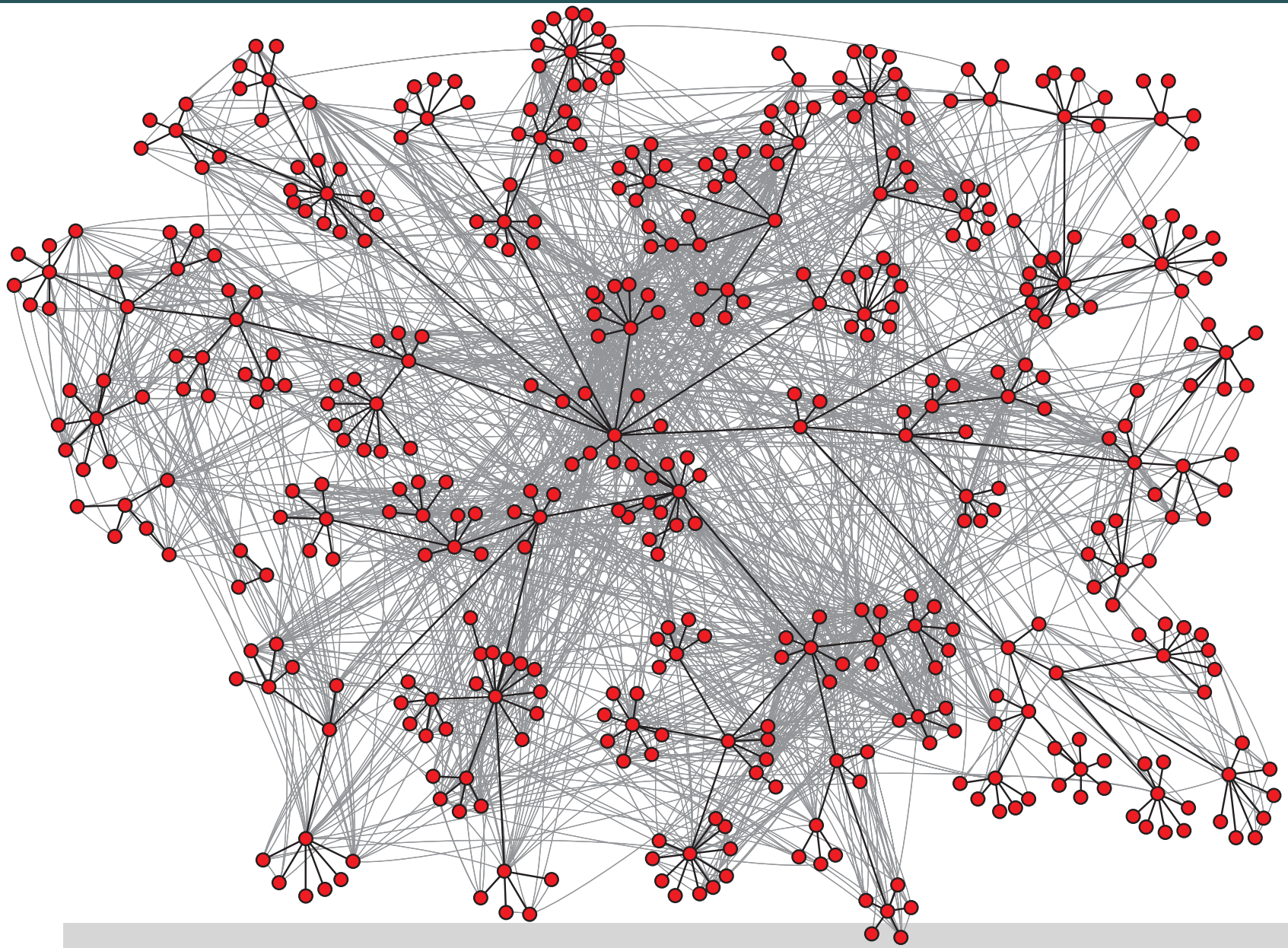


structure of the Internet at the level of autonomous systems. Data source: Mark Newman http://www-personal.umich.edu/~mejn/netdata/.

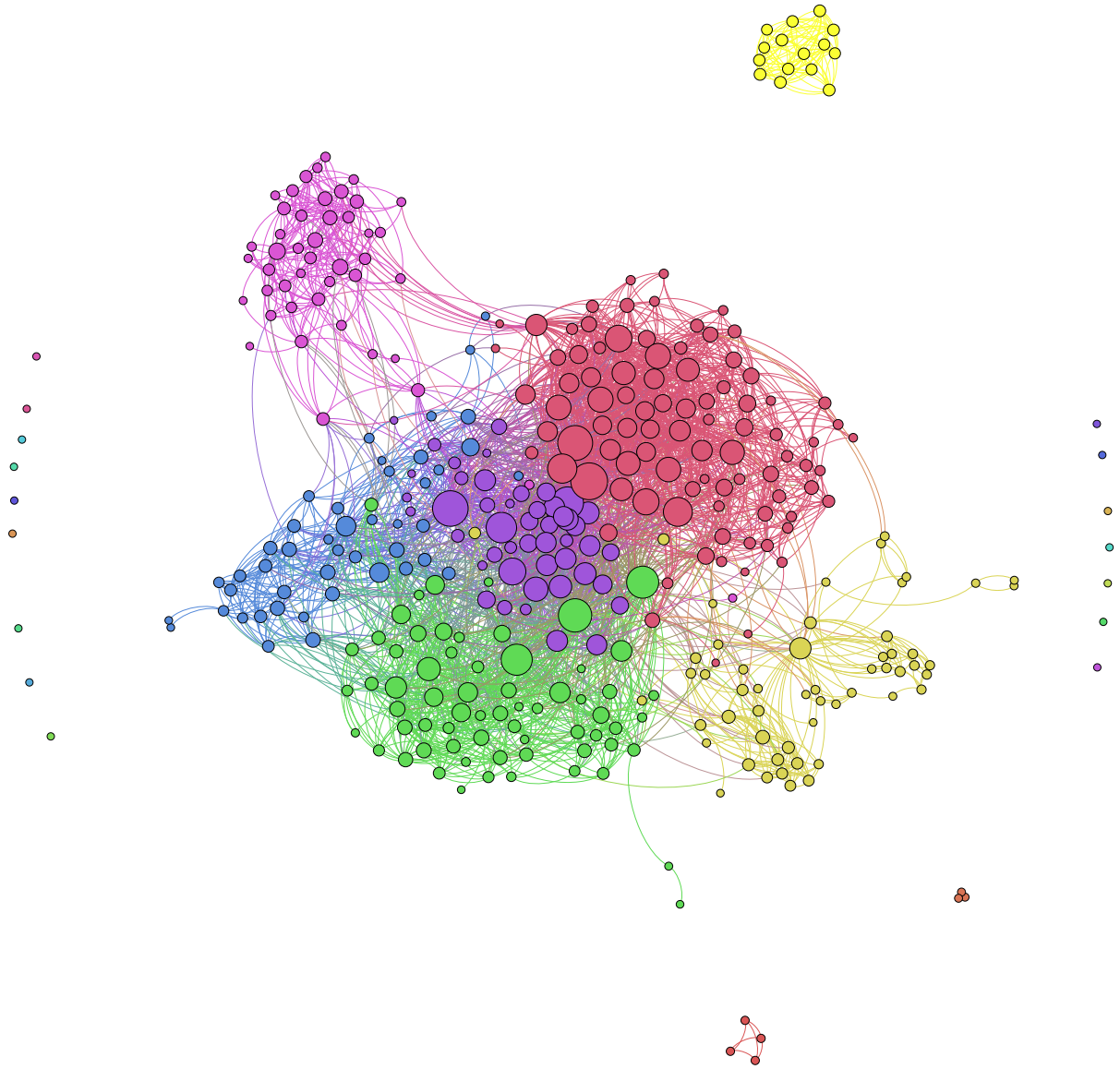
Political blogs



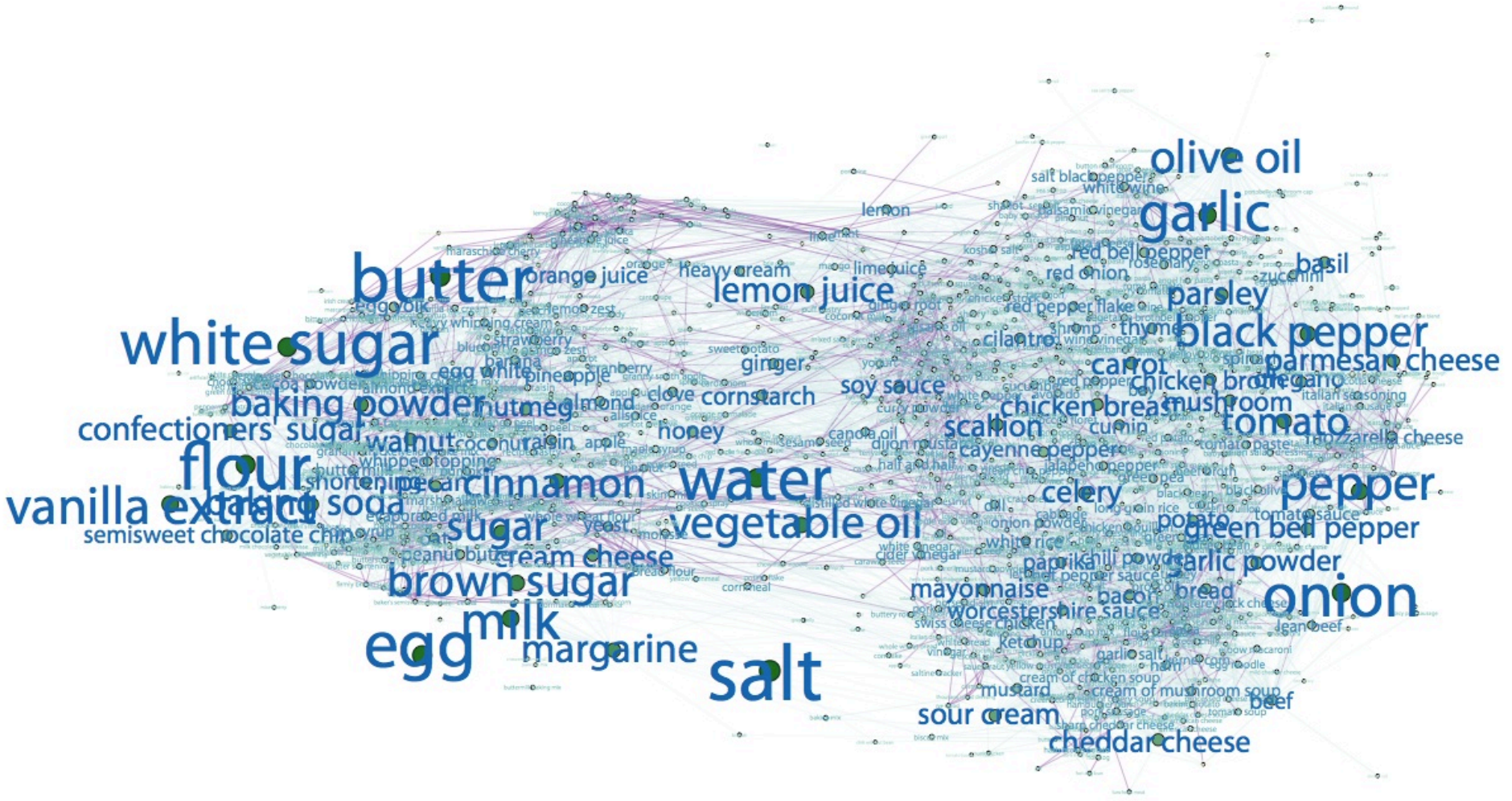
Organizations



Facebook networks



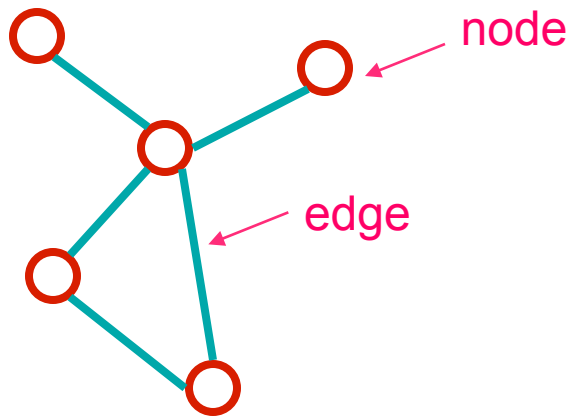
Ingredient networks



What are networks?

- Networks are sets of nodes connected by edges.

"Network" ≡ "Graph"



points	lines	
vertices	edges, arcs	math
nodes	links	computer science
sites	bonds	physics
actors	ties, relations	sociology

goal: characterize network structure

- Are nodes connected through the network? (week)1
- How far apart are they? (week 1)
- Are some nodes more important due to their position in the network? (week 3)
- Is the network composed of communities? (week 4)

goal: model network formation

- Randomly generated networks (week 2)
- Preferential attachment (week 2)
- Small-world networks (week 5)
- Optimization, strategic network formation (week 5)

goal: understand how network structure affects processes

- information diffusion (weeks 2 & 6)
- opinion formation (week 6)
- coordination/cooperation (week 6)
- resilience to attack (week 2)

What about weeks 7 & 8?

- Week 7: cool and unusual applications of SNA
- Week 8: SNA and online social networks