CS6012: Social Network Analysis

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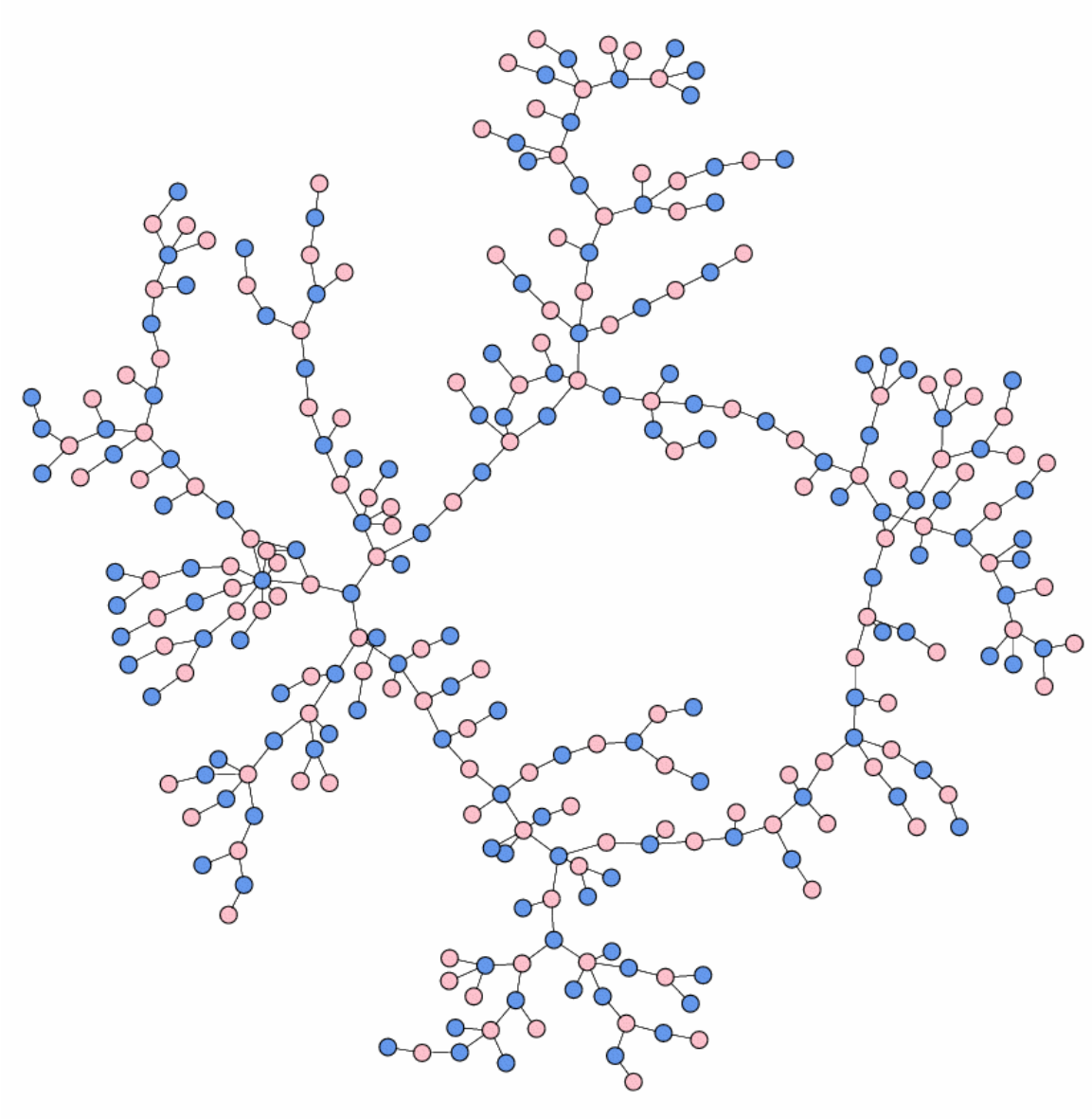
Slot: C?

Social Networks!

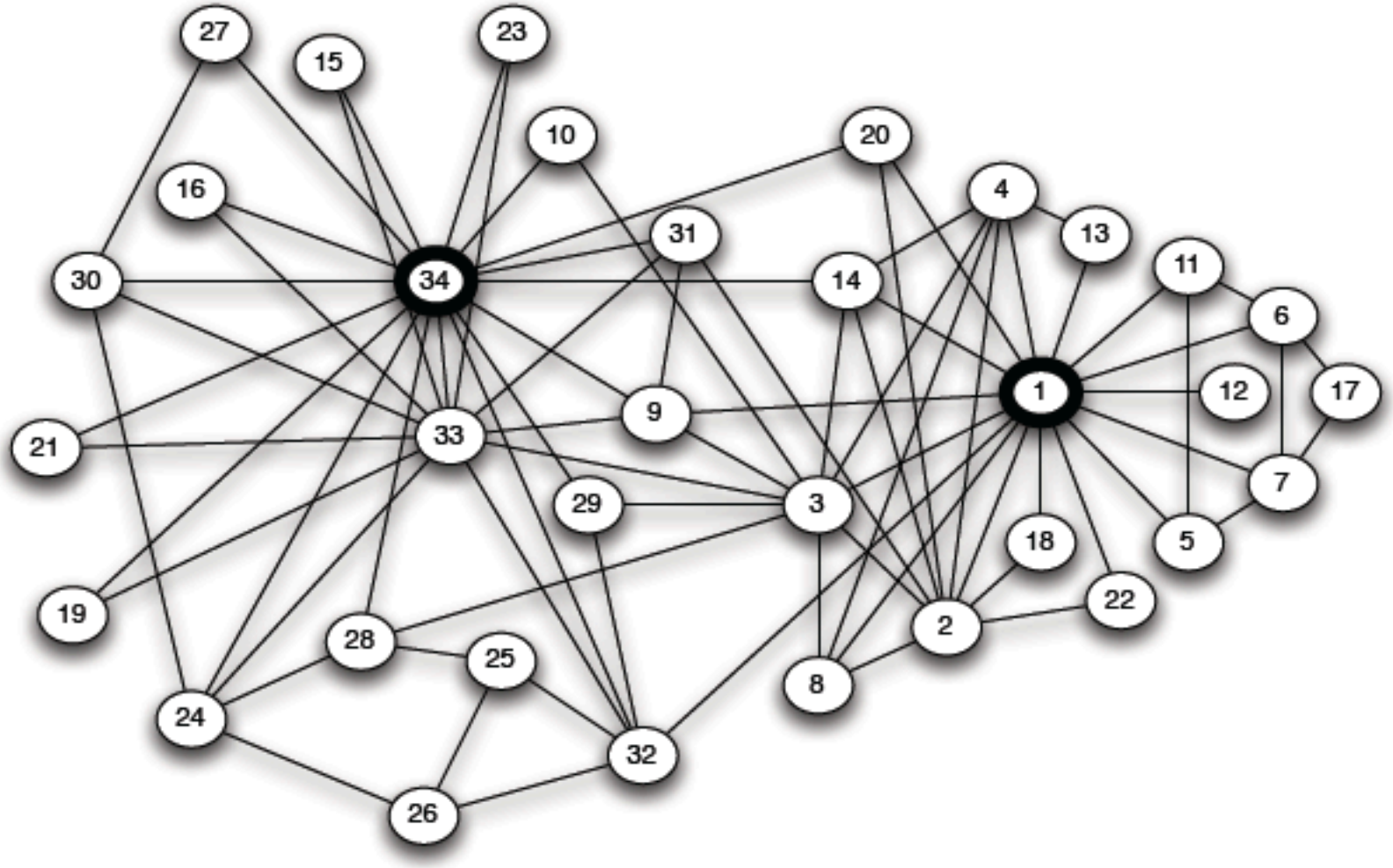
What is a “Social Network”?

- A network of interacting entities
- Represented as a graph
  - Nodes are actors
  - Edges are relations
- Data about vast networks available
  - Scale is a major problem with modern day networks
- Study various properties of networks
  - Long history in sociology, with smaller networks
  - Bring to bear technologies from graph theory, statistics, data mining, sociology, game theory, and economics

High School Dating



Karate Club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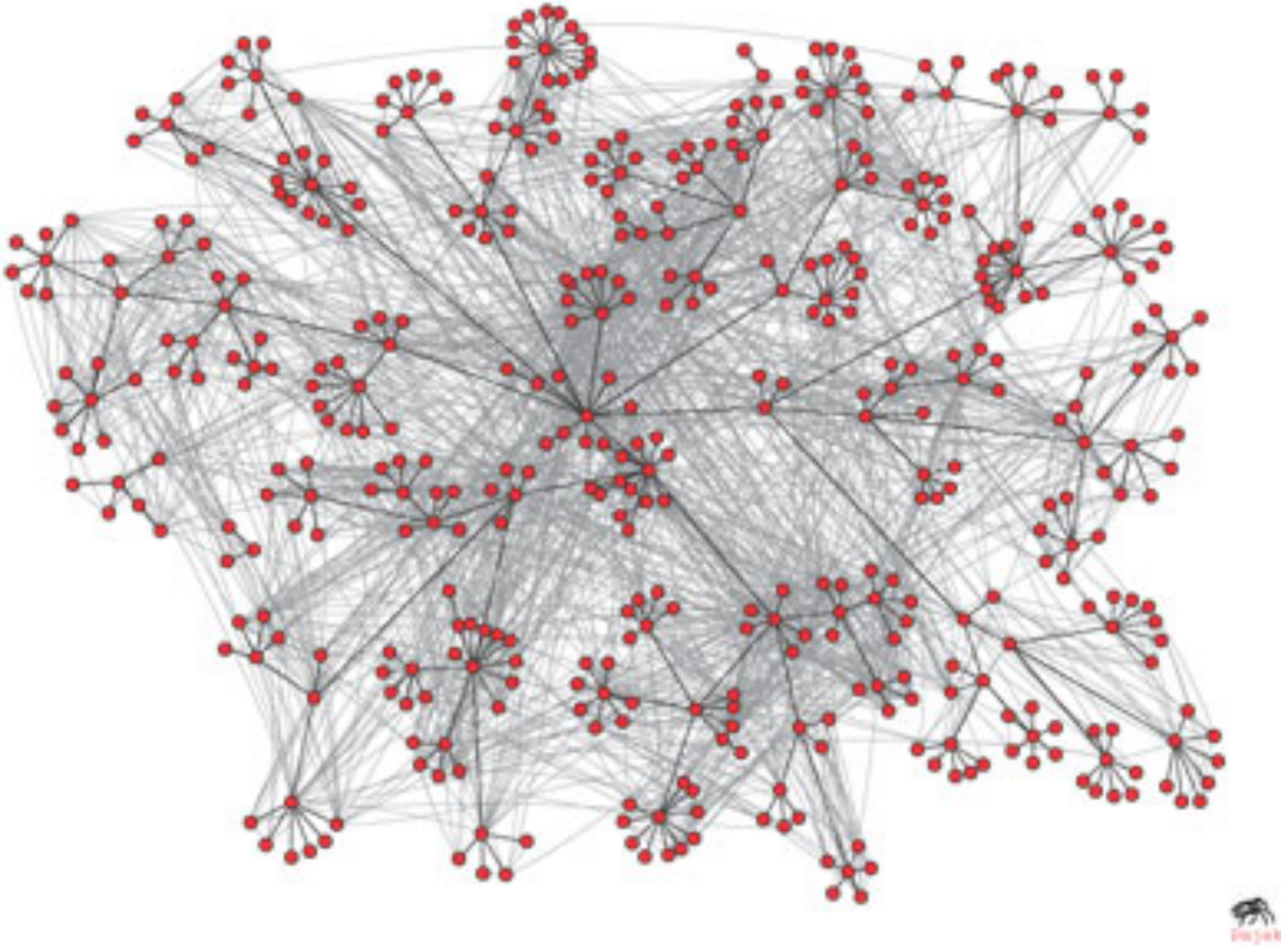
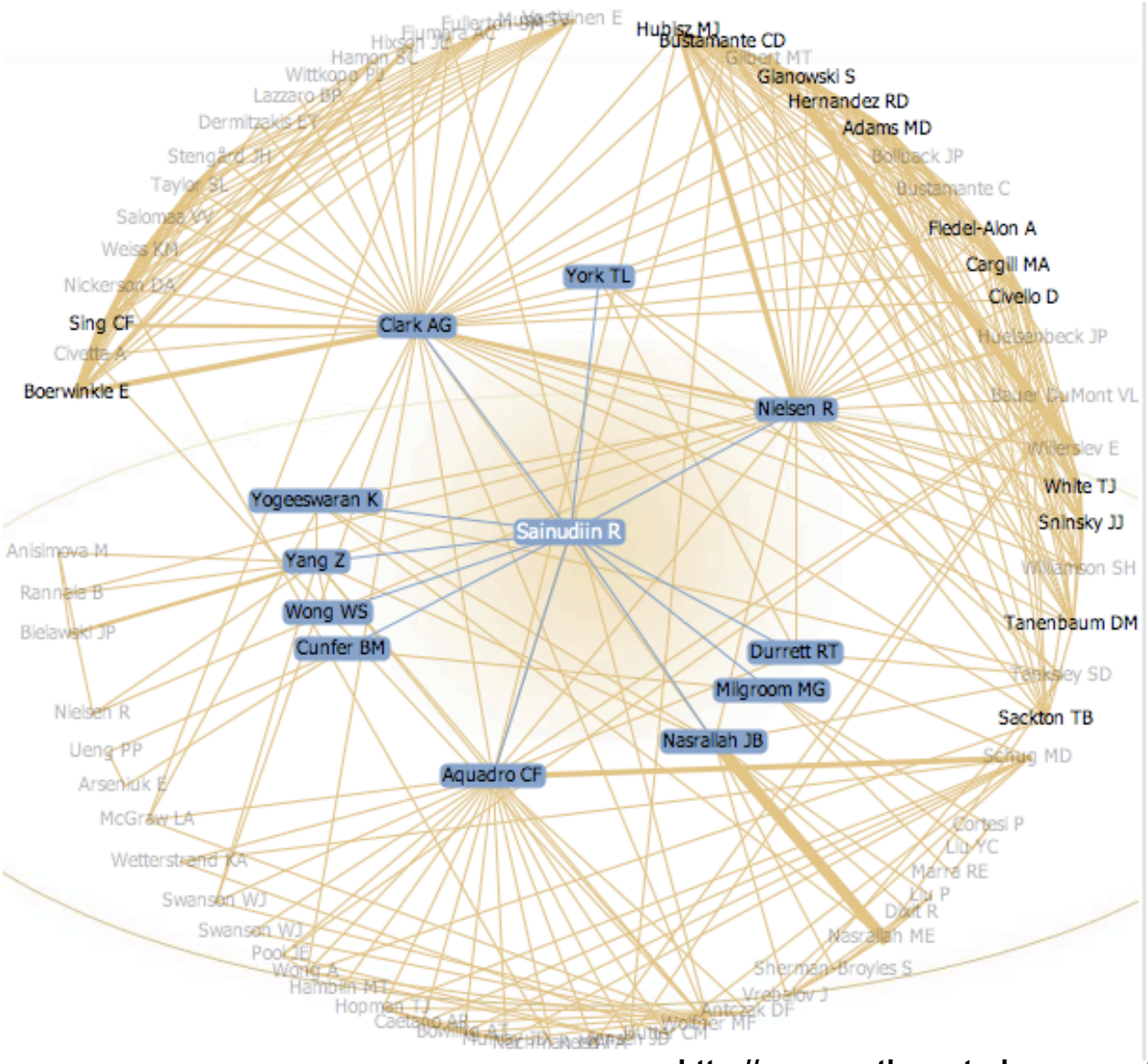
Corporate E-mail



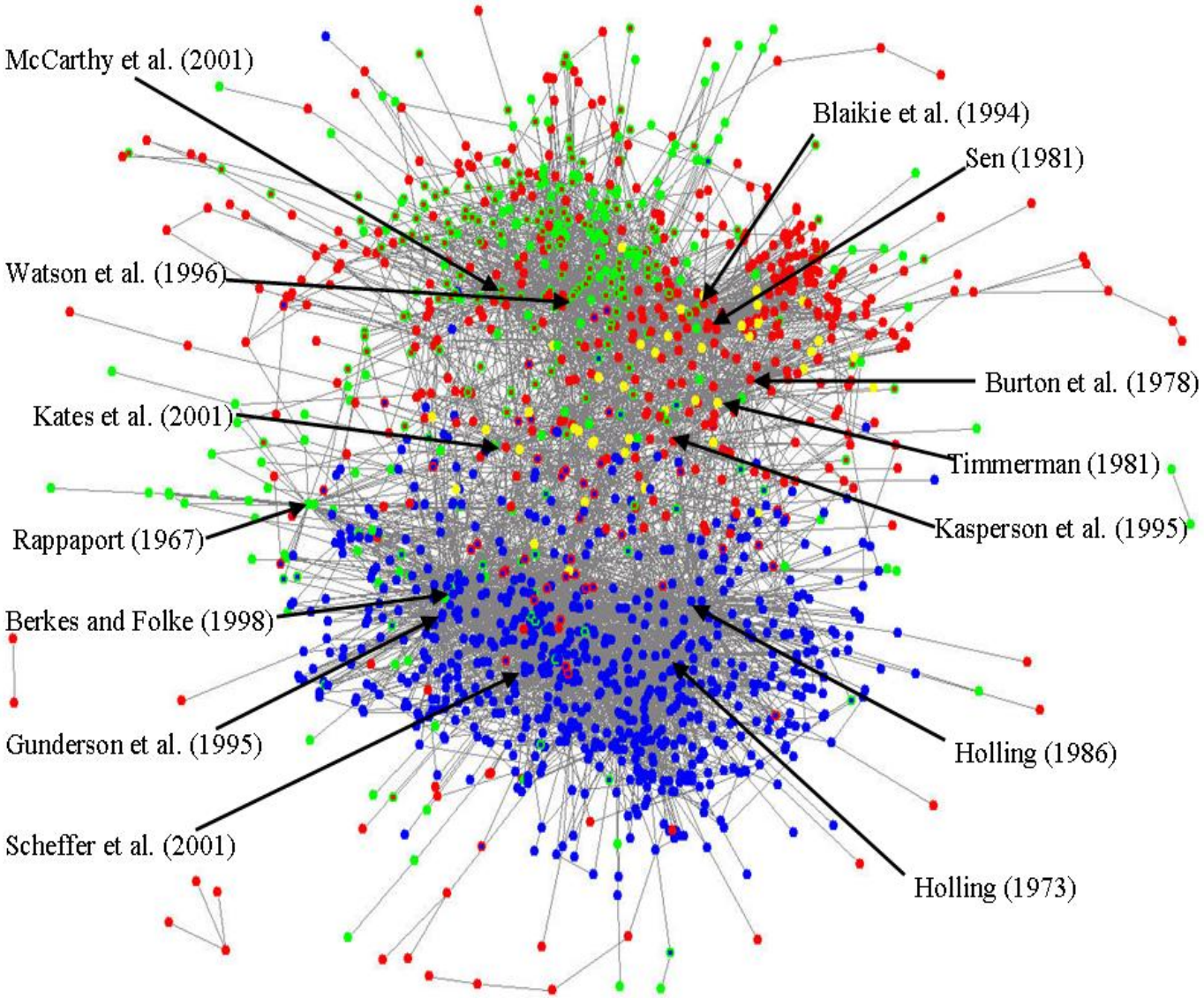
Examples of Networks



Collaboratio
n Graph

http://www.math.canterbury.ac.nz/~r.sainudiin/pubmedcollaborations.shtml

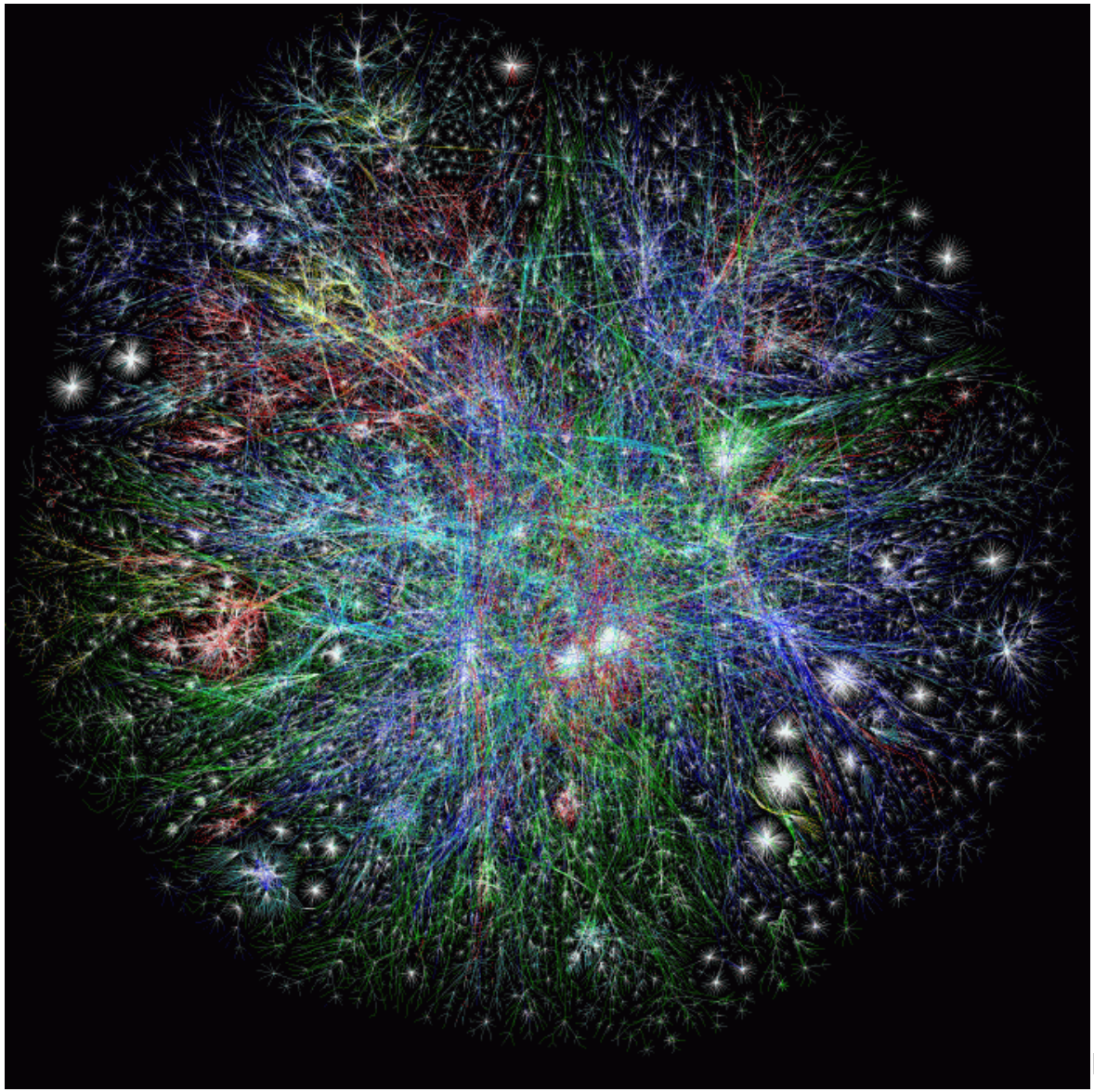
Examples of Networks



Citation network

http://www.public.asu.edu/~majansse/pubs/SupplementIHDP.htm

More Examples of Networks

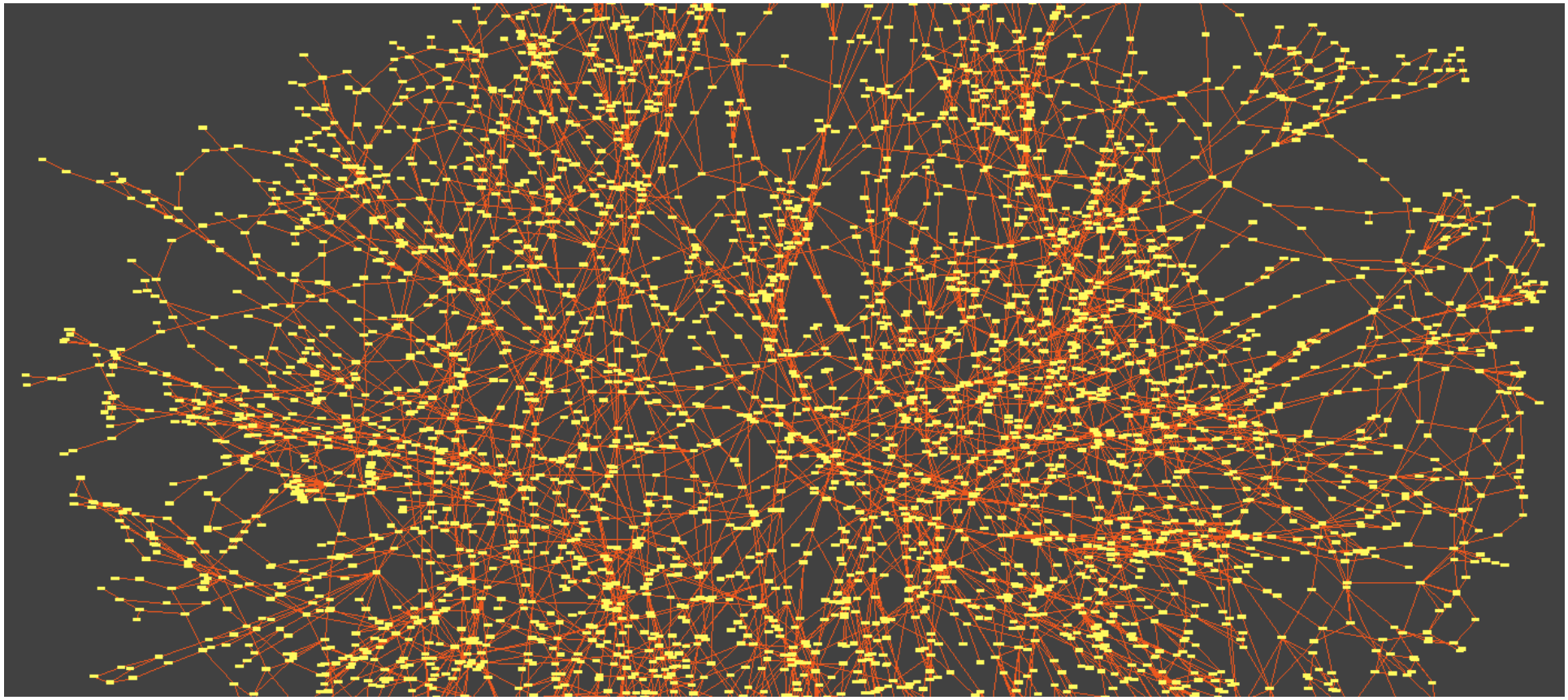


Internet Graph

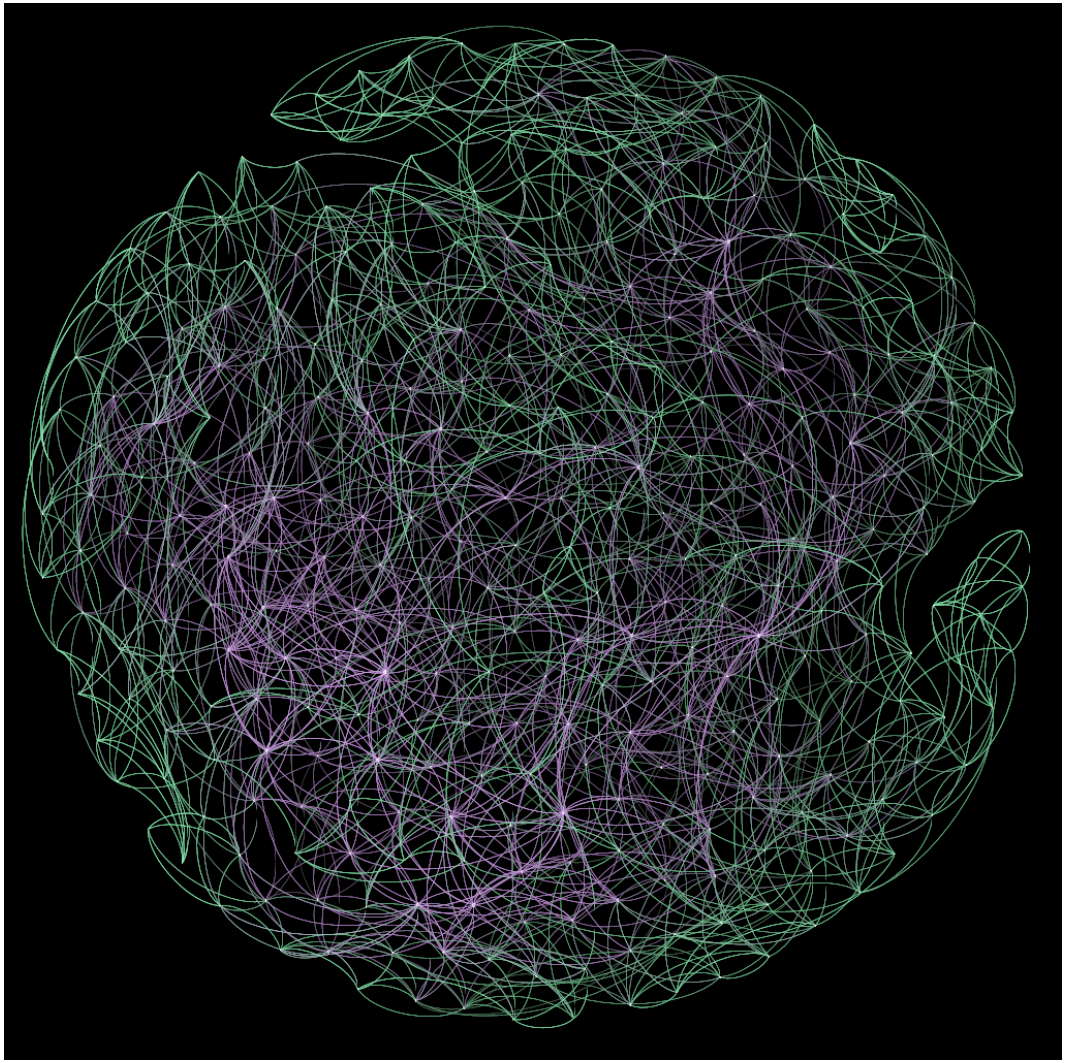
http://blog.melchersystem.com/category/web-20/

Examples of Networks

Power Grid



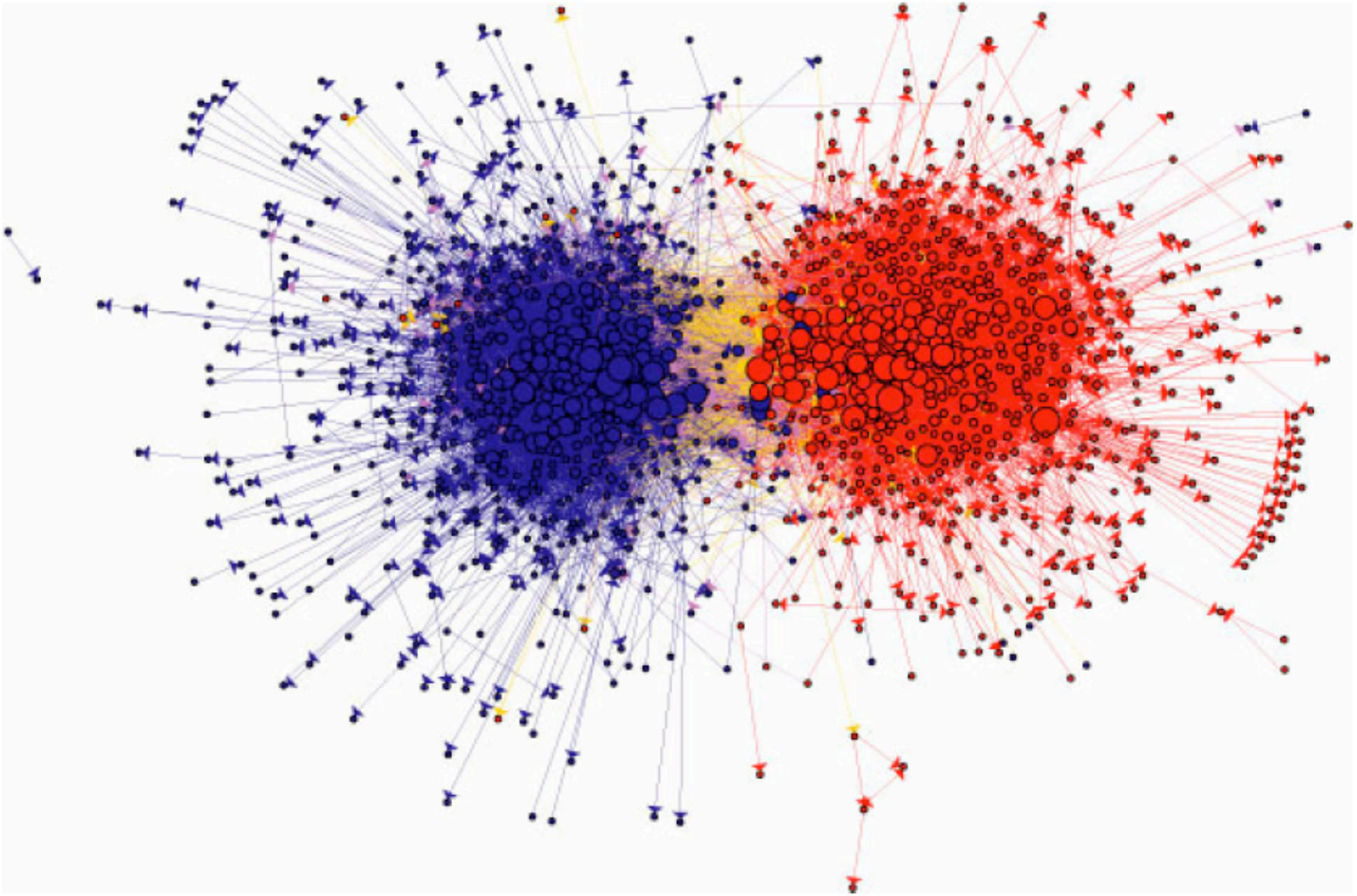
Protein Contact Graph



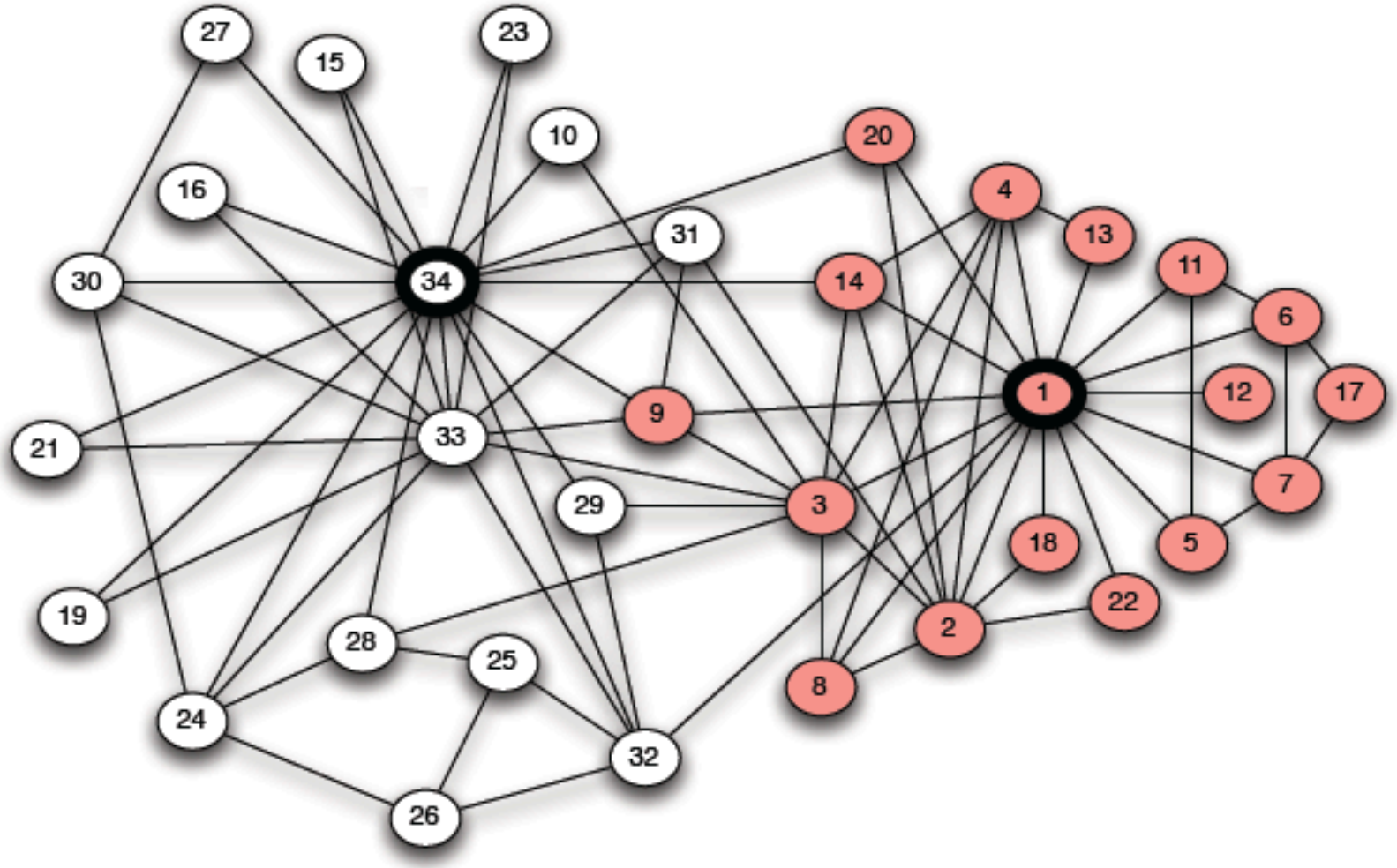
Why study networks?

- Identify communities/groups
  - Research areas (citation network)
  - Protein functionality (protein interaction network)
- Understand dynamics in a community
  - Churn prediction
  - Viral spread
- Study dynamics of community formation
- Identify roles of individuals
  - Alpha users
  - Socialite

Liberal vs conservative



Karate Club Schism



Overview..

- Social Networks capture *connectedness*
- Structural
  - Who is connected to who?
  - Graph Theory
- Behavioral
  - What are the interactions?
  - Game Theory

Details..

- Textbooks:
  - Networks, Crowds and Markets: Reasoning about a Highly Connected World. David Easley, Jon Kleinberg. Cambridge
  - Social Network Analysis: Methods and Applications. Stanley Wasserman, Katherine Faust. Cambridge
  - Game Theoretic Problems in Network Economics and Mechanism Design Solutions. Y. Narahari, et al.
- One exam
- Several Assignments
- Presentation?
- One project - teams

SNA view of facebook