

The background of the image is a complex, dense network of blue lines and spheres. The lines are thin and crisscross in various directions, creating a web-like structure. Interspersed among these lines are numerous blue spheres of varying sizes, some appearing as nodes in the network. The overall effect is a sense of interconnectedness and complexity. The text "Social Networks" is centered over this background in a bright red, bold, sans-serif font.

Social Networks

Centrality

- Measure of importance
- Value associated with every node
- Many different measures which capture different aspects
- Can be characterized by the nature of the flow
- Assumes structure reflects importance
Bavelas experiment

Centrality

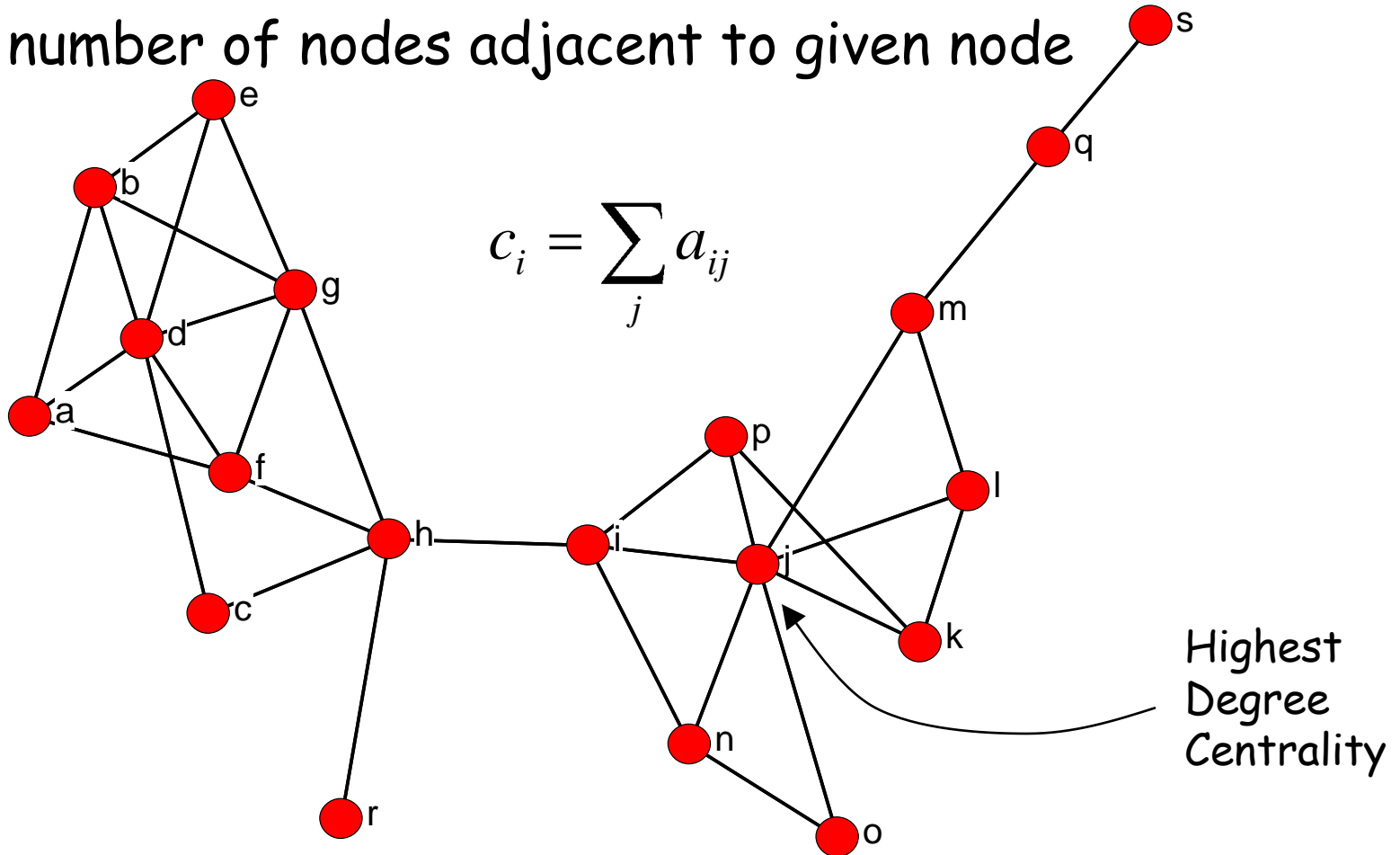
- Degree
 - how well connected; direct influence
- Closeness
 - how far from all others
 - how long information takes to arrive
- Betweenness
 - brokerage, gatekeeping, control of info
- Eigenvector (popularity)
 - being connected to the well connected

Centrality

- Path-based
 - Degree
 - Closeness
 - Betweenness
 - Flow betweenness
 - Redundancy/constraint
- Walk-based
 - Eigenvector
 - Bonacich Power
 - Katz
 - Hubbell

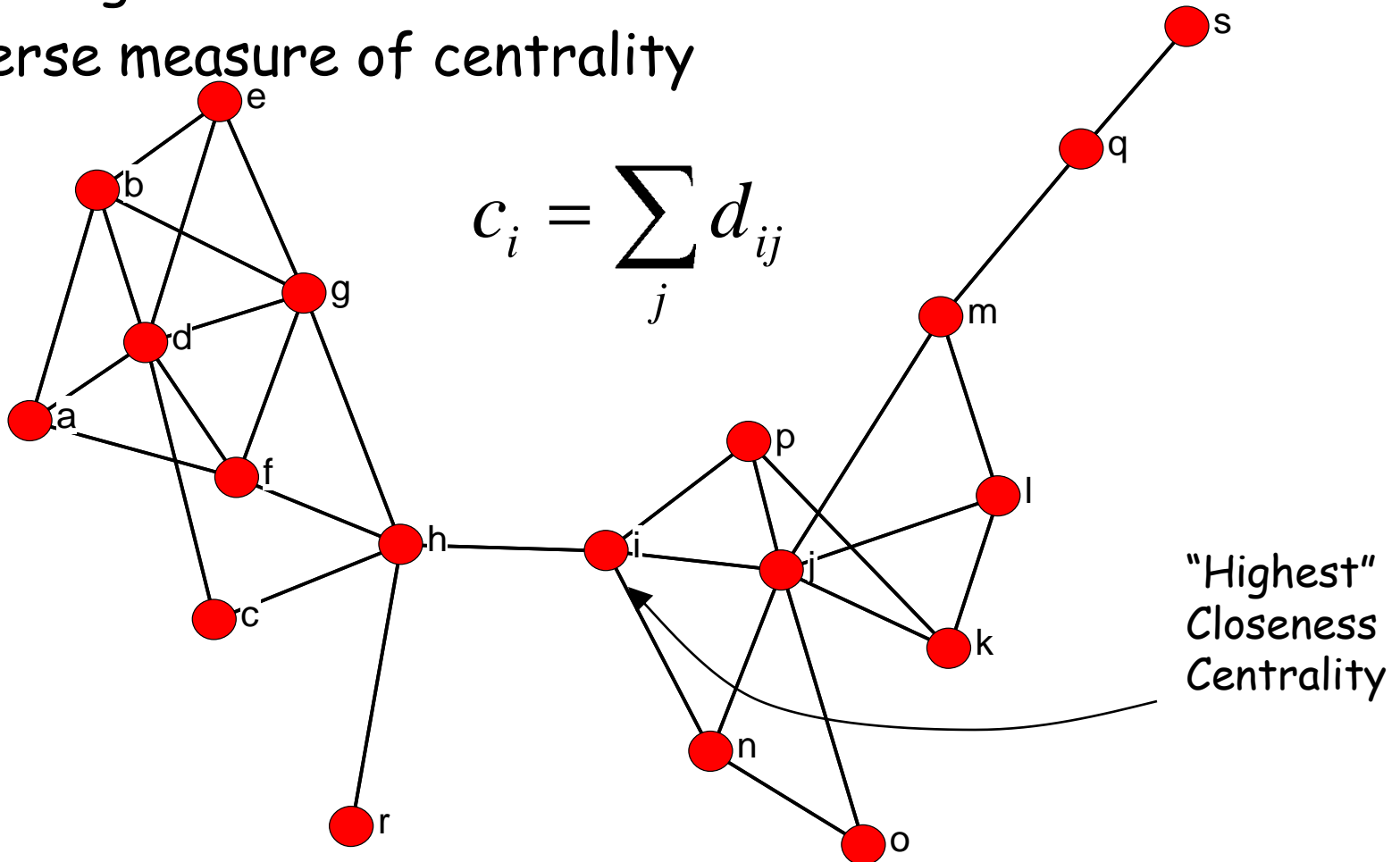
Degree Centrality

- The number of nodes adjacent to given node



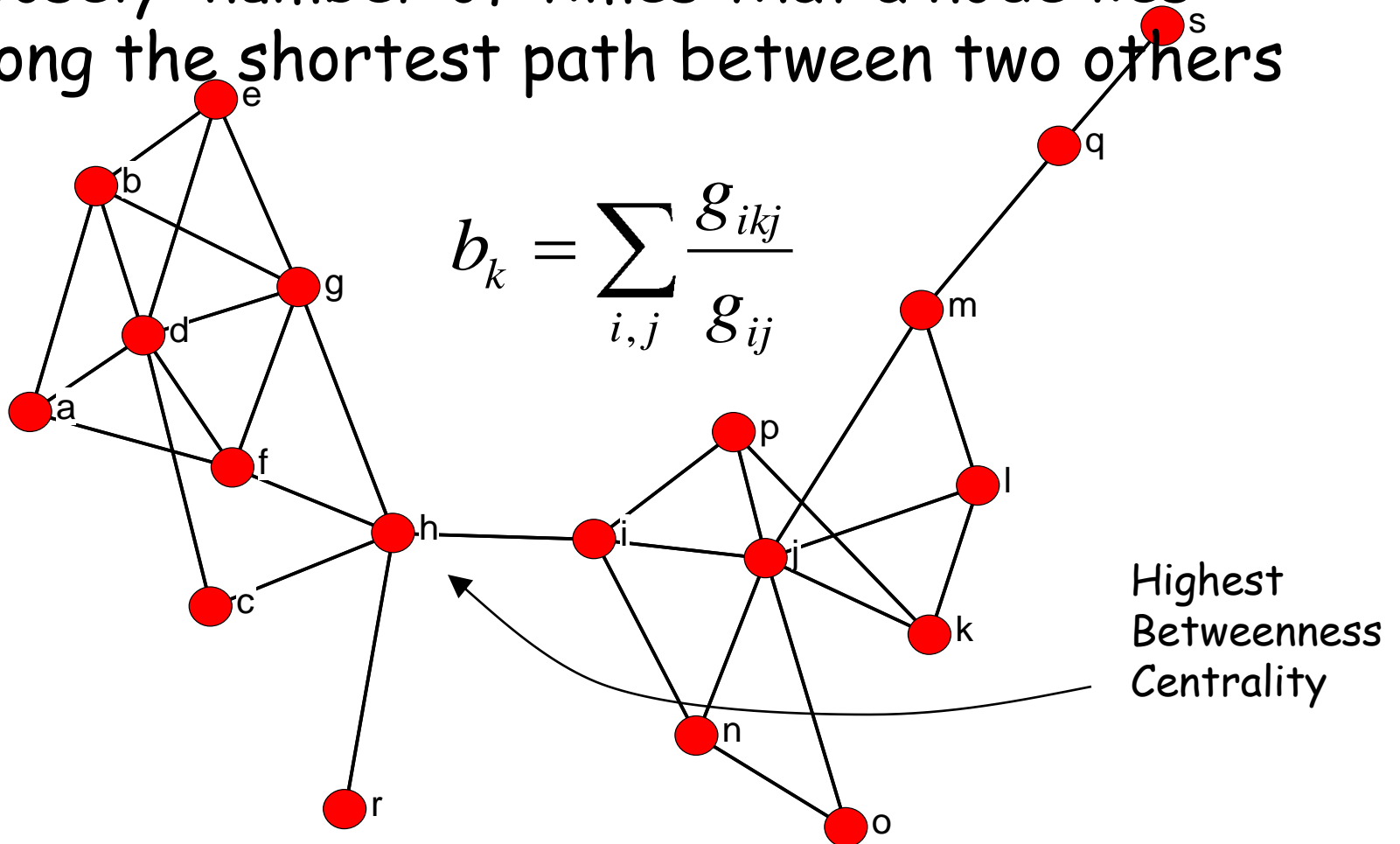
Closeness Centrality

- Sum of geodesic distances to all other nodes
- Inverse measure of centrality



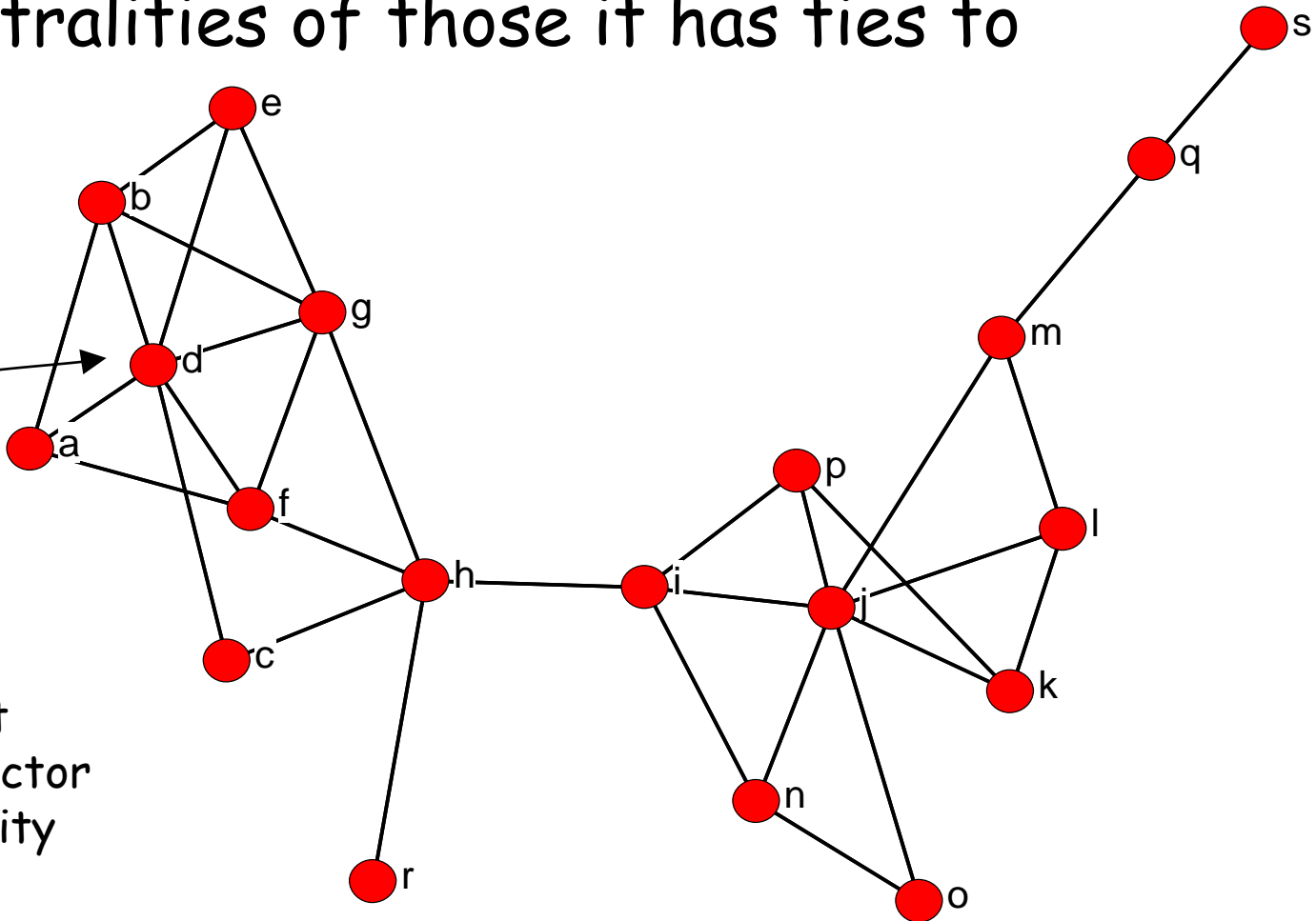
Betweenness Centrality

- Loosely: number of times that a node lies along the shortest path between two others



Eigenvector Centrality

- Iterative version of degree centrality: a node's centrality is proportional to the sum of centralities of those it has ties to

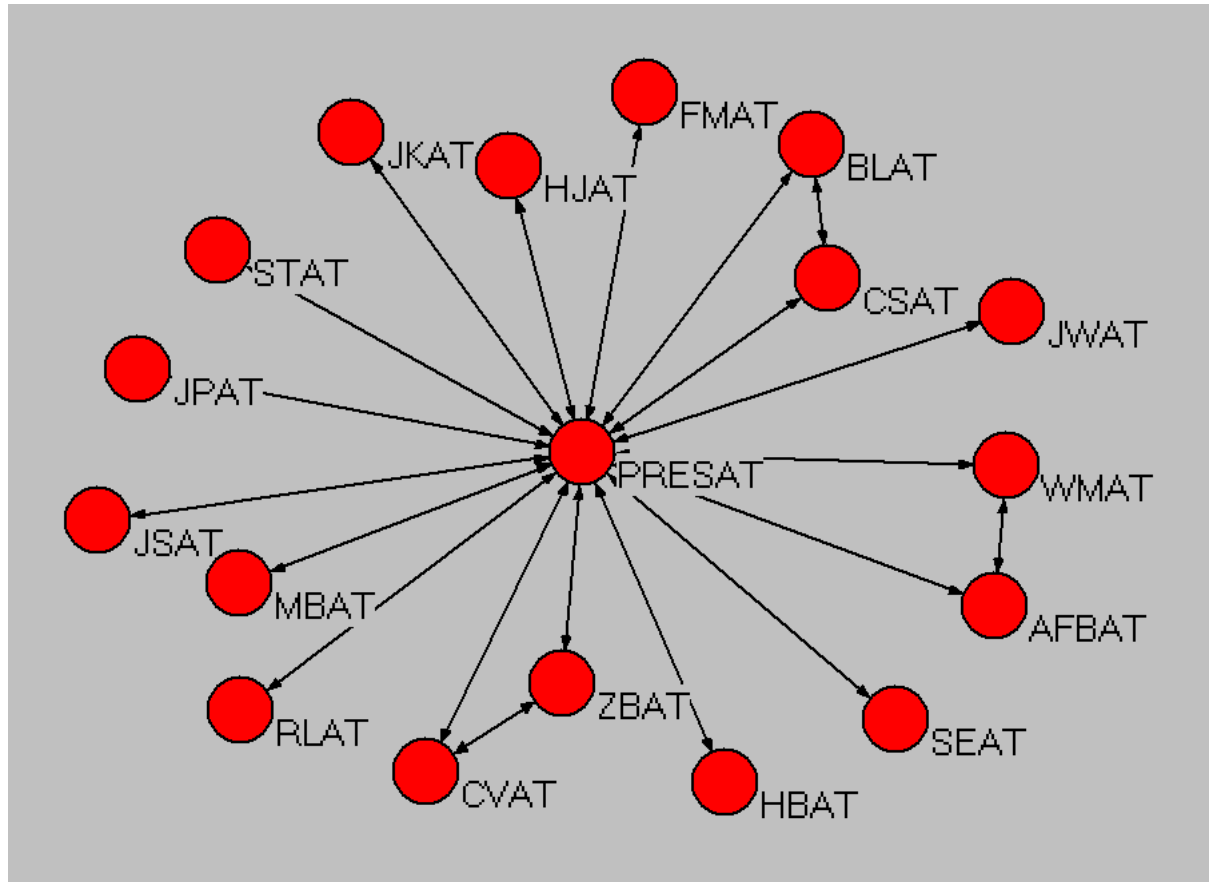


Power of the Middle

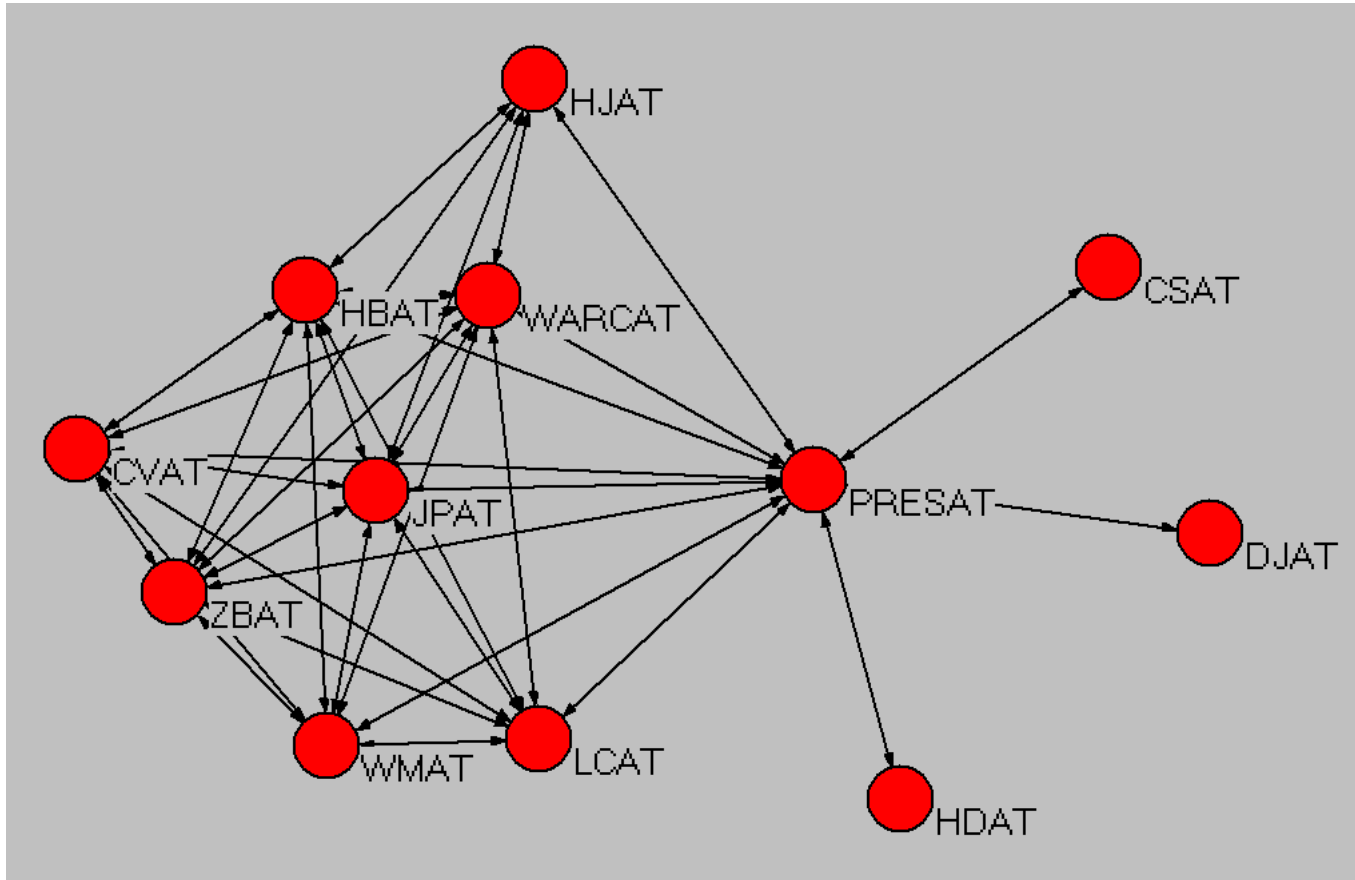
- Drawing from different cultural or informational pools
 - synthesis, innovation, value
- Toll-taking, brokerage
- Gatekeeper (secretary-power)
- Play others off each other
- Autonomy -- multiple identities

Carter Administration: Year 1

Cyrus Vance, State
Zbigniew Brzezinski, Security
Michael Blumenthal, Treasury
William Miller
Harold Brown, Defense
James Schlesinger, Energy
Juanita Kreps, Commerce
Charles Schultze, Economics
Bert Lance, Budget



Carter Administration: Year 4



Life in the Military

A case by David Krackhardt

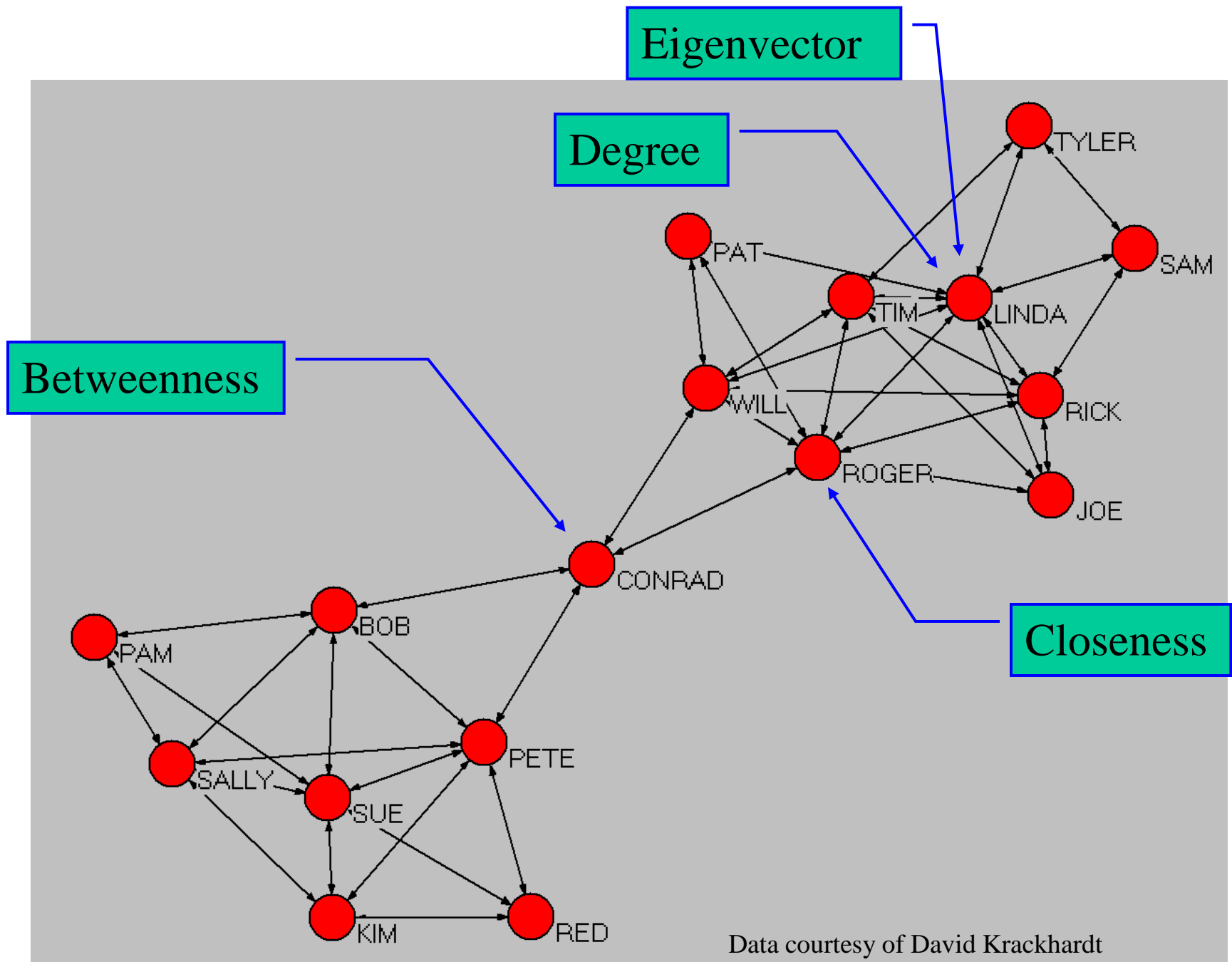
Roger was in charge of a prestigious Advisory Team, which made recommendations to the Joint Chiefs of Staff. His experience was considerable, and he was a well-respected authority in the area. Of the 16 people who worked for him (see accompanying chart), he trusted those who also had a considerable amount of wartime experience, either in Vietnam or in other combat operations. He found their counsel to be particularly valuable.

Roger and Rick each had a PhD, and the remaining people all had graduate professional degrees in a variety of areas. Bob, Pete, Red and Sally were the newest members of the Team (they had been there for almost a year), and were fresh out of training in advanced weapons technology. Pete was the youngest member of the team. His background was computer science, and he had worked at MIT in their Draper Labs on simulations of war strategies using various weaponry.

Life in the Military ... cont.

Linda was a senior member of the team and also one of the most approachable. She saw it as part of her responsibility to make sure people were getting along with each other, since cooperation across this disparate group was critical to its effectiveness. She and Rick would frequently hold social events to help solidify the group. Linda had been with the group the longest (almost 12 years) and had seen it grow in stature and respect over that time.

Roger had been criticized recently for his management style, which was admittedly authoritarian. At the request of some of his colleagues, he had called in an organizations consultant to advise him and the Team how to best proceed with teamwork and other managerial issues. The consultant ran team-building workshops. Roger felt that the consultant was a “touchy-feely” type and that the experience had been a total waste of time. He refused to bring in any more consultants. Some of the Team members were talking behind the scenes about resigning or requesting a transfer.



Data courtesy of David Krackhardt

Centralization

- The extent to which the network is dominated by a single actor Eg Carter Admin Year 1
- $\sum C_{max} - C_i$ normalized
- Measures the extent to which the network looks like a star network

Data Types

Degree: Disconnected, directed, valued

Closeness: binary strongly connected

Betweenness: Disconnected, directed binary

Eigenvector: Connected valued undirected