# Introduction to Networks

Noshir Contractor

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How did we get here?
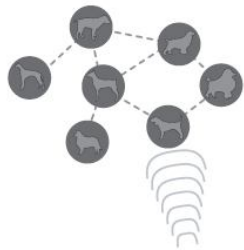
SNIF: Social Networking in Fur

Group: Noah Fields, Jonathan Gips, Philip Liang, Arnaud Pilpré

What

We present a system that allows pet owners to interact through their pets' social networks. Inexpensive, unobtrusive hardware can be affixed to pet collars and paraphernalia in order to augment pet-to-pet, pet-to-owner, and owner-to-owner interactions. SNIF devices aggregate pertinent environmental, social, and individual information that can be broadcast or addressed to other participating community members.

Why

Pets already function as social devices. Walking a dog in the park can lead to conversations that one might not otherwise have. Pets function as active icebreakers that will go up to anyone without any notion of social inhibition. Furthermore, pet-owners love buying products for their pets: sweaters, leashes, collars, toys, dishes, and beds. These items provide a set of rich interactions that can be brought into the digital world.
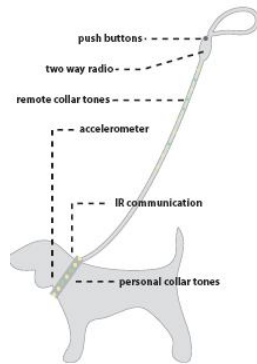
How

The SNIF starter kit includes a leash and collar as well as membership in the online community.

SNIF collars contain an LED display, an IR transceiver, and various sensors such as accelerometers and digital thermometers. They function as output devices that display personalized "collar tones" when the pet comes in proximity to another pet. They serve as input devices that sense activity levels, microclimate conditions, and other pets' presence.

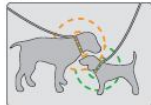The SNIF leash contains a two-way RF device, such as the Ambient Devices platform, and serves multiple purposes in the SNIF system. When attached to a pet's collar, it can upload information from the collar to the SNIF servers. When disconnected, the leash functions as an ambient device that displays real-time information, which is streamed from the SNIF servers, relevant to the pet and pet owner. For example, the leash displays the "collar tones" of frequently encountered pets that are going out for a walk. It may also give an indication of the general pet-walking index.

The online community portion of SNIF allows pet-owners to set privacy preferences, communicate with other pet owners, arrange pet outings, and customize the ambient information that their SNIF leashes display.
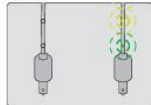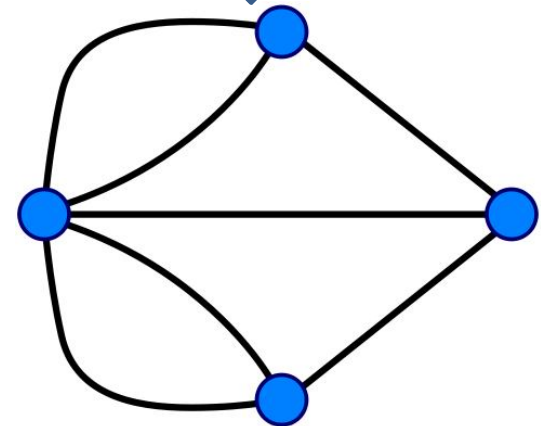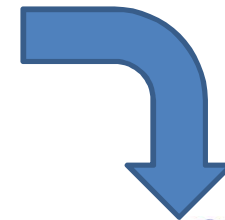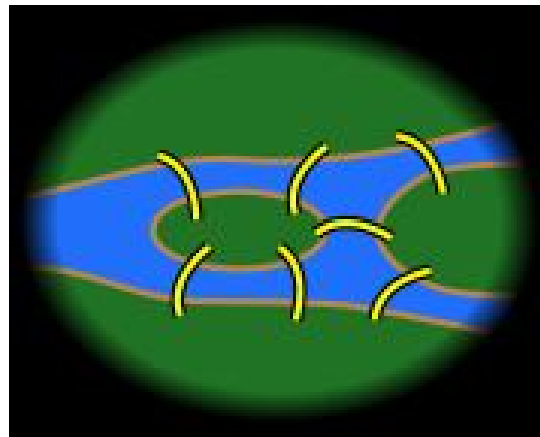
Extensions

Pet toys that serve as tangible interfaces for the pet.
Degrees of separation between pets that changes as they interact.
Remote monitoring of pet's activity.
Local RF detection to display degrees of separation from the other pets in the vicinity.
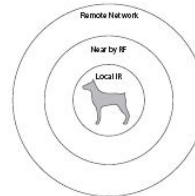
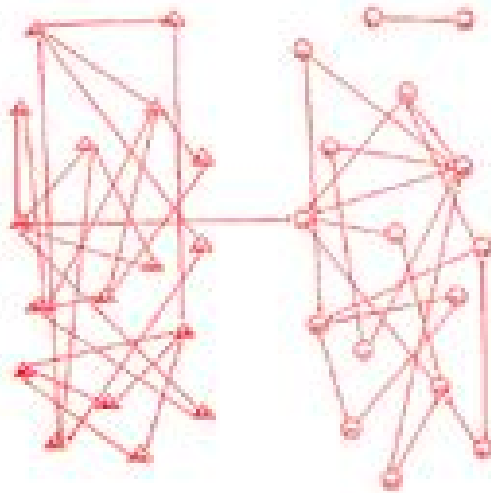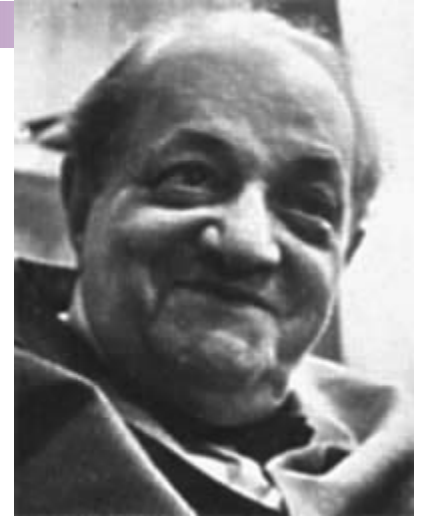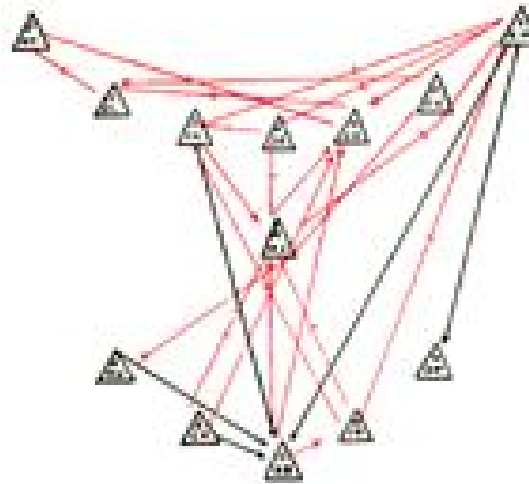# History: Networks in the 1800s
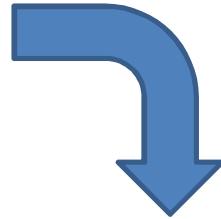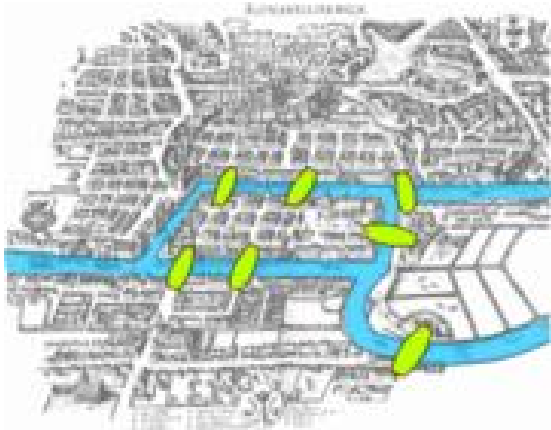
Seven Bridges of Konigsberg

1930s: Jacob Moreno

- Jacob Moreno introduced the ideas and tools of sociometry.

Friendship choices among 4th graders (Moreno 1934)

Positive & negative affect in a football team (Moreno 1934)

The Origins of Network Analysis

The New York Times.

Copyright, 1933, by The New York Times Company.

Entered as Second-Class Matter,
Postoffice, New York, N. Y.

NEW YORK, MONDAY, APRIL 3, 1933.

TWO CENTS

EMOTIONS MAPPED BY NEW GEOGRAPHY

Charts Seek to Portray the Psychological Currents of Human Relationships.

FIRST STUDIES EXHIBITED

Colored Lines Show Likes and Dislikes of Individuals and of Groups.

MANY MISFITS REVEALED

Dr. J. L. Moreno Calculates There Are 10 to 15 Million Isolated Individuals in Nation.
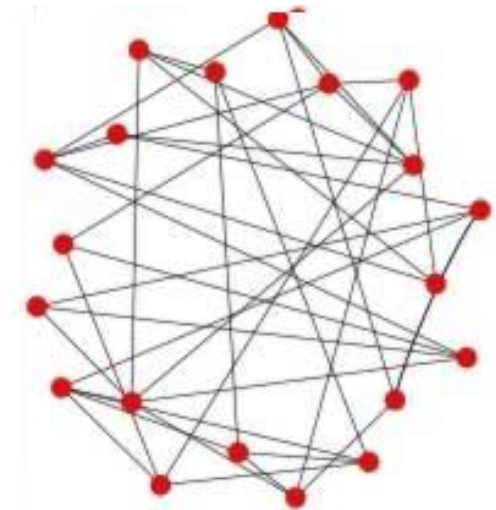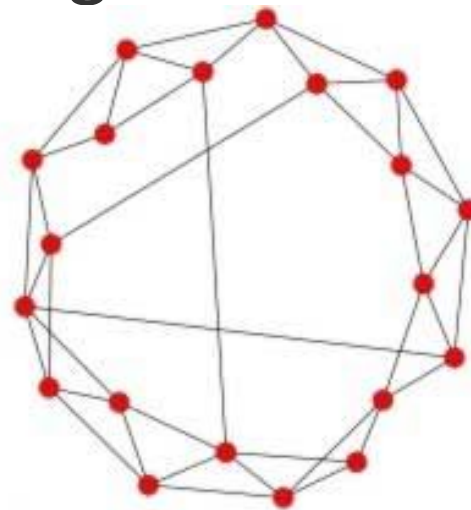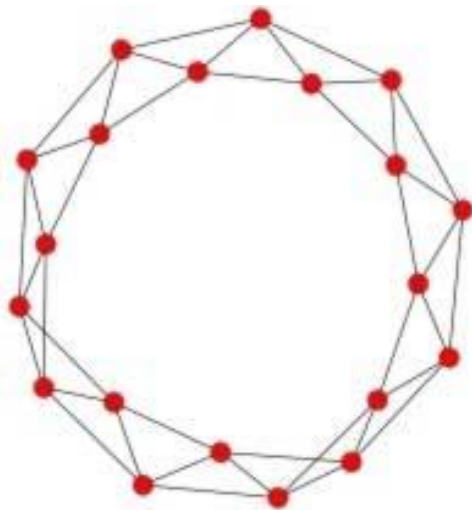
1950s: Group networks

- In the 1950s, Alex Bavelas founded the Group Networks Laboratory at M.I.T to study the effectiveness of different communication patterns in helping small groups of people solve common tasks.
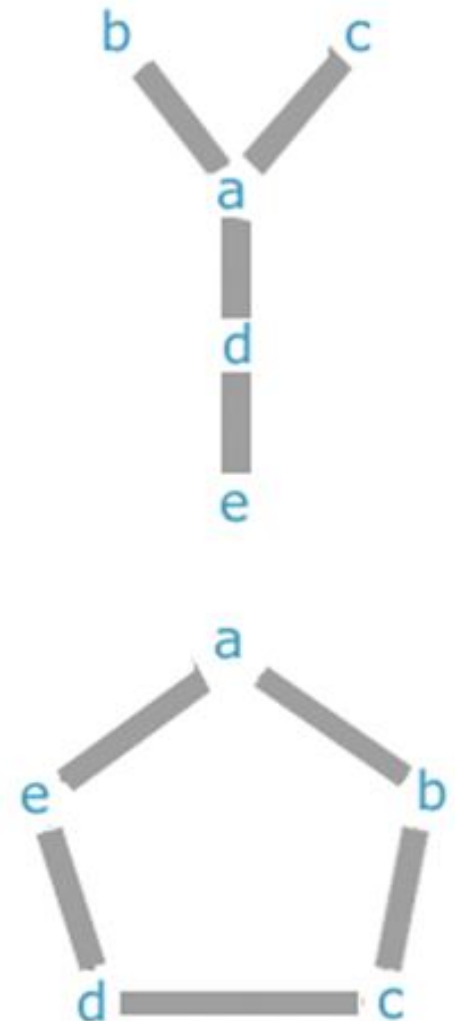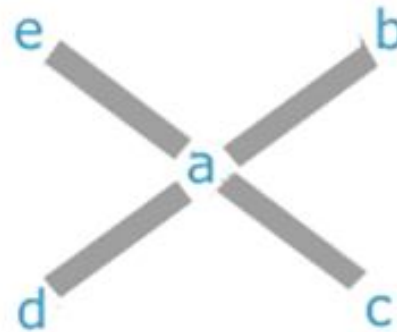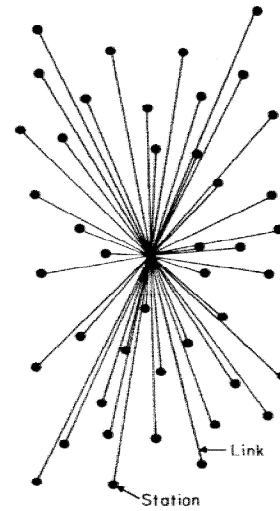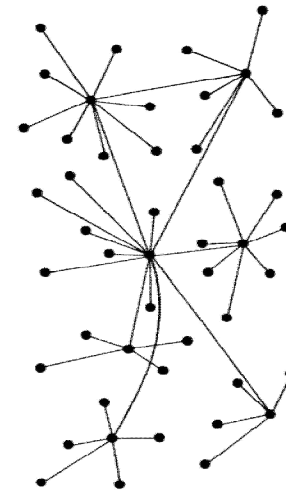
1960s: Stanley Milgram

- Milgram: Small World Experiments. Six degrees of separation.
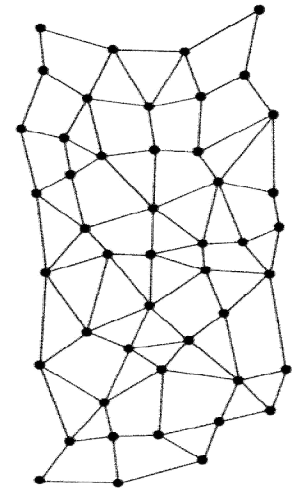
- Granovetter: Strength of weak ties
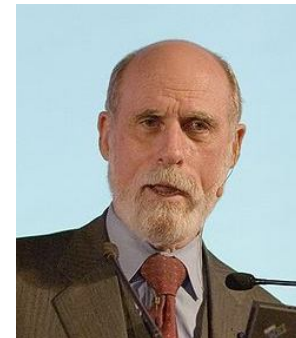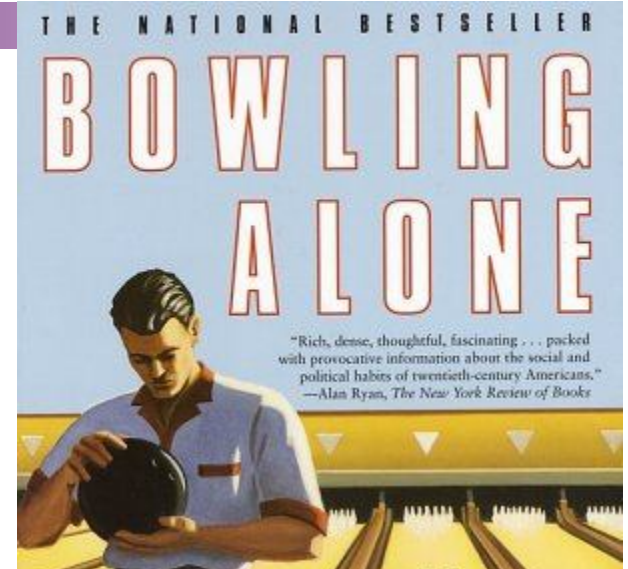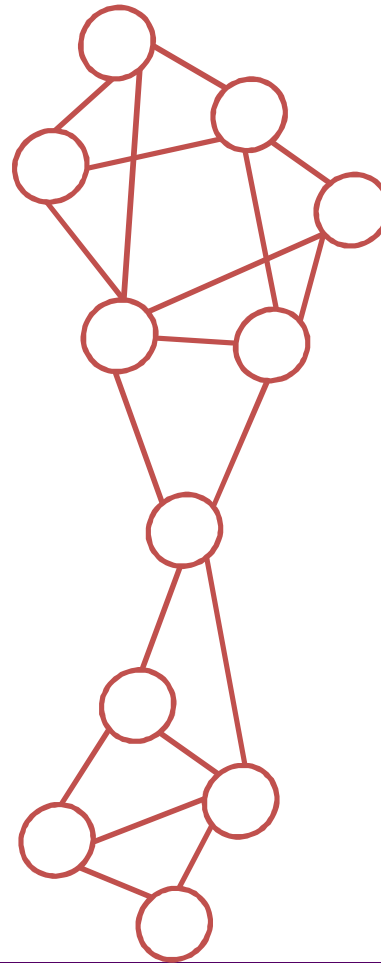
70s-80s: Internet
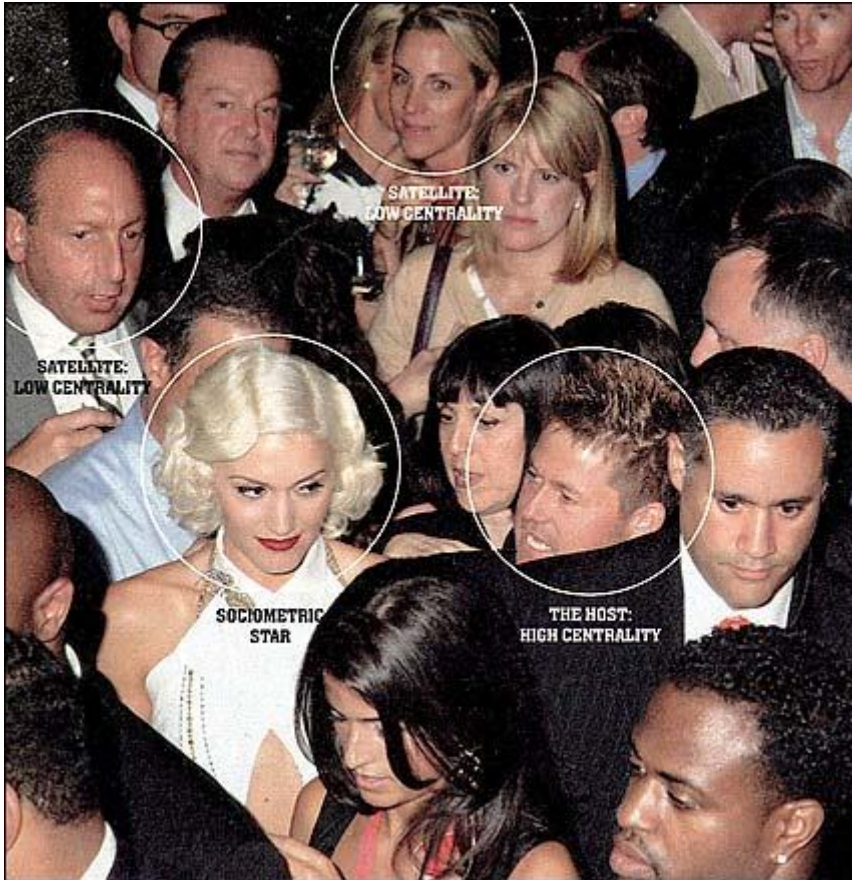

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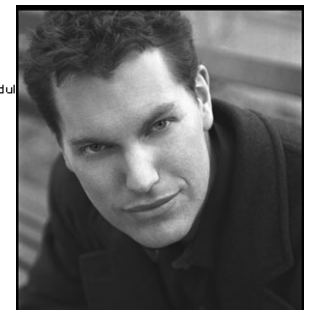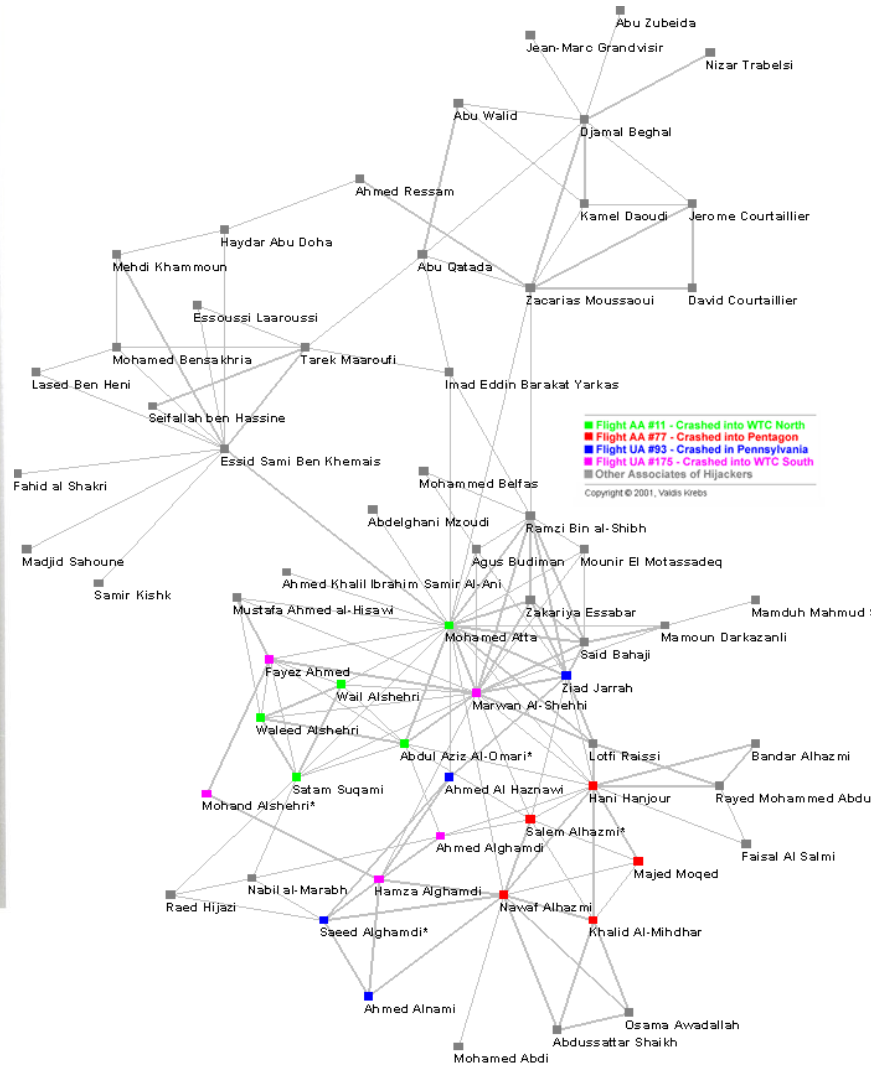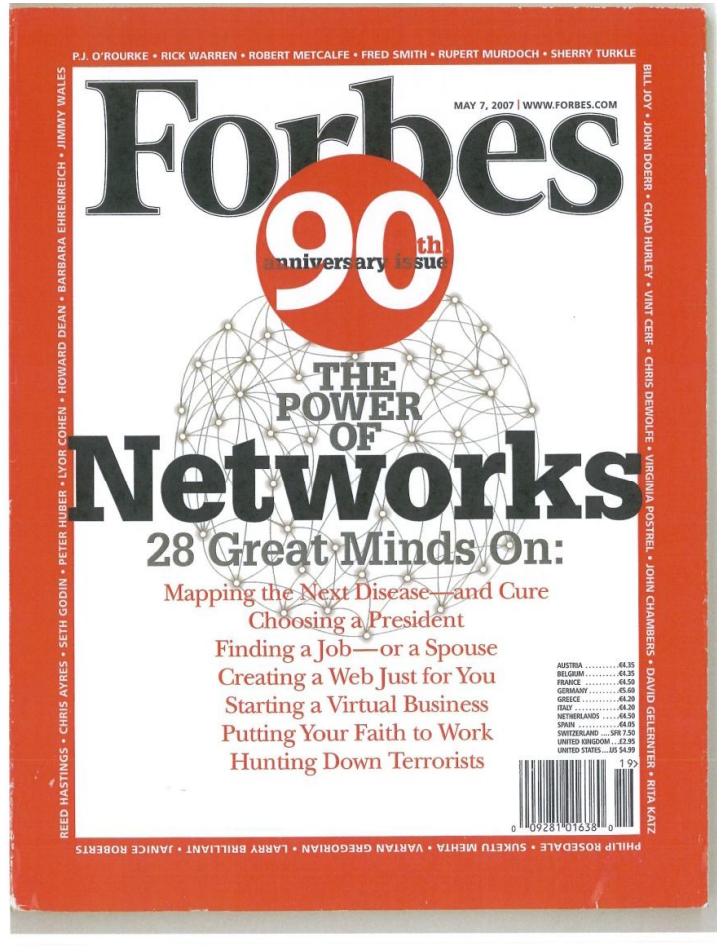
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Donna Cox & Robert Patterson, 1992

80s-90s: Social capital

- Brokers, closure, & bowling

90s-00s: Network science

Network Science forTechno-SocialSystems

- Techno-socialsystems:
  "*infrastructurescomposedofdifferenttechnologicallayers are interoperatingwithin the social componentthat drive theiruse and development […] (they) consistoflarge scale physicalinfrastructures (suchastransportationsystems and powerdistributiongrids) embedded in a dense web ofcommunication and computinginfrastructureswhosedynamics and evolution are defined and drivenbyhumanbehavior*" (Vespignani 2009: 425)

- Examples: World Wide Web, Internet, WiFicommunicationtechnologies

- The challenge: predicting the behavioroftechno-socialsystemswhere the human and the computingelement are intertwined

- CharacteristicsofTechno-SocialSystems:
  - Multiscale
  - Complexity
  - DynamicSelf-Organization
- CriticalIssues: "*forecastingphenomena in techno-social system startswithourlimitedknowledgeof society and humanbehaviorratherthanwith the physicallawsgoverningfluid and masses*" (Vespignani 2009:425)
- Itisnotsimply a matterofpredictionprecision - predictionsinfluence system'sbehavior (e.g. Millennium Bug)

Kevin Bacon Linked to Al-Qaeda