Social Network Analysis
소셜네트워크분석: 기본개념과 UCINET 활용

NAM, YOONJAE PH.D.
KYUNGHEE UNIVERSITY, KOREA
YNAM@KHU.AC.KR
Today Agenda

• What is “Social Network”? 
• What is “Social Network Analysis”? 
• How to analyze “Social Network” with “UCINET”?
Social Network?

YOU DON’T GET TO 500 MILLION FRIENDS WITHOUT MAKING A FEW ENEMIES

IN CINEMAS 28 OCT

facebook

GREE

t

mixi

LINE
Social Network

Social network
From Wikipedia, the free encyclopedia

This article is about the theoretical concept as used in the social and behavioral sciences. For social networking sites, see Social networking service. For other uses, see Social network (disambiguation).

A social network is a social structure made up of a set of social actors (such as individuals or organizations), sets of dyadic ties, and other social interactions between actors. The social network perspective provides a set of methods for analyzing the structure of whole social entities as well as a variety of theories explaining the patterns observed in these structures.[1] The study of these structures uses social network analysis to identify local and global patterns, locate influential entities, and examine network dynamics.

Social networks and the analysis of them is an inherently interdisciplinary academic field which emerged from social psychology, sociology, statistics, and graph theory. Georg Simmel authored early structural theories in sociology emphasizing the dynamics of triads and "web of group affiliations."[2] Jacob Moreno is credited with developing the first sociograms in the 1930s to study interpersonal relationships. These approaches were mathematically formalized in the 1950s and theories and methods of social networks became pervasive in the social and behavioral sciences.
Social Network & Social Media

• Social Network does NOT exactly mean Social Media

• Rather, Social Networking Service (SNS) can be a tool of Social Media
Social Media

• Social media refers to a set of online tools that supports social interaction between users. (Hansen et al., 2011).
  • E.X. email, discussion forums, blogs, microblogs, texting, chat, social networking sites, wikis, photo and video sharing sites, review sites, and multiplayer gaming communities

• Traditional media Vs. Social media
  • Interactive information sharing
  • Interoperability
  • User-centered design
  • Collaboration on the World Wide Web
What is Social Network?

• A world of connections (Hansen et al., 2011)
  • kinship, language, trade, exchange, conflict, citation, and collaboration.
  • Networks of social interactions and exchanges are primordial.
  • Social network can be defined as a set of relations that applied to a set of actors, as well as any additional information on those actors and relations.
Connection, Communication, Social Network

Simply stated, a social network is a collection of things and their relationships to one another.
Basic network components: Node and Link

• **Node**
  - Unit of analysis (individual or higher-level component)
  - Other terms: actors, points or vertices (graph theory)
  - *E.g.* workgroups, teams, organizations, institutions, states, or even countries, web pages, keyword tags, videos.

• **Link**
  - Relationship between nodes
  - Other terms: lines, edges or geodesics (graph theory)
  - *E.g.* proximity, collaborations, kinship, friendship, trade partnerships, citations, investments, hyperlinking, transactions, and shared attributes.
Social Network Structure
(Data & Sociogram)

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Facebook Friends?
0= No
1= Yes
Sociograms; Visualizations of the network structure

Wheel

More centralized

All channels

Denser
Sociograms; Visualizations of the network structure

Five Small Group Structures

Chain

Wheel

Comcon

Y

Circle
Why look at the network structure?

- Structure of a group makes a difference in terms of ...
  - task performance
    - Simple tasks vs. Complex tasks
  - overall satisfaction
  - individual satisfaction

- A social role is defined by a node’s pattern of relations with the other nodes in the system

- Network Analysis attempts to identify social positions by taking a large number of nodes
Network Structural Equivalence
Statistical Network Attributes
System level

• Connectedness or density
  • \( C = \frac{\text{# of links}}{\text{# of possible links}} \)
  • Possible links = \( n(n-1)/2 \) for non-directional
  • \( n(n-1) \) for directional

• System Integration
  • average of the degree to which nodes links to focal node are linked to one another.

• System Openness
  • the degree to which the nodes are linked to external nodes (percentage of total links).
Measures of Centrality

- **Degree** - # of ties or S of tie strengths
  - **Indegree** - # of ties received
  - **Outdegree** - # of ties initiated
  - Indegree = Outdegree for non-directional data

- **Betweenness** – proportion of all geodesics linking j & k that pass through i, S for all nodes
  - Wheel (5) = 1.0; Wheel (1) = 0.0
  - Chain (5) = 0.8; (2, 3) = 0.6; (1,4) = 0.0

- **Closeness** – reciprocal of S of the lengths of geodesics to or from all other nodes
  - Chain (5) = 6/4 = 1.5; (1&4) = 10/4 = 2.5; (2&3) = 7/4 = 1.75
  - Wheel (5) = 1 node 3 = 1; (1-4) = 7/4 = 1.75

- **Eigenvector** – position of i on first eigenvector normalized of sociomatrix
Examples 1: Nam, Y, Lee Y-O & Park, H-W (2015) Measuring web ecology by Facebook, Twitter, blogs and online news: 2012 general election in South Korea, Quality & Quantity, 49(2)
Example 2: Nam, Y, Barnett, GA. & Kim, D. (2014) Corporate hyperlink network relationships in global corporate social responsibility system, Quality & Quantity, 48(3)
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https://sites.google.com/site/ucinetsoftware/home