CS 8803 Social Computing: Networks (Ties)

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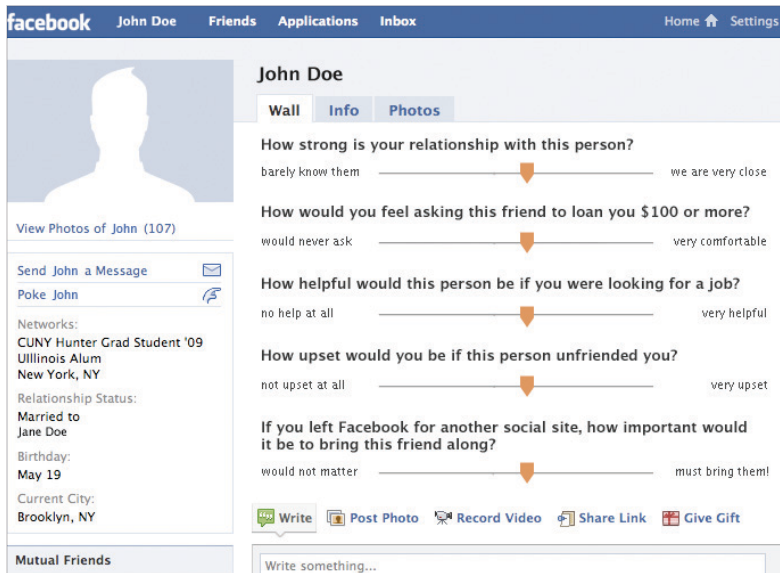
Week 7 | October 1, 2014

The Strength of Weak Ties

Summary

- First sociological study of social ties
- The strength of a tie is defined in terms of four dimensions: amount of time, intimacy, intensity and reciprocal services
- Finding: even weak ties can be valuable
  - Weak ties can also act as bridges, and can help information diffuse faster
  - Generally weak ties have role in social cohesion and mobility, e.g., findings a job, geographic move, forming interest communities
- Strong ties are high maintenance; weak ties prevent small highly connected cliques from fragmenting
- Content of ties not considered; theory not validated with data!

Predicting Tie Strength With Social Media

Summary

- First study to quantitatively measure social tie strength.
- Based on Facebook data of 35 participants, they define 74 predictor variables of tie strength
- Seven different categories of the predictor variables:
- 85% predictive accuracy based on an OLS regression model; findings supplemented with interviews
- Findings:
  - Intimacy strongest feature; structural balance i.e., number of overlapping networks least
  - Strong ties provide emotional support, weak ties are great for accessing new kinds of information

How strong is your relationship with this person?

barely know them ———————————— we are very close

How would you feel asking this friend to loan you $100 or more?

would never ask ———————————— very comfortable

How helpful would this person be if you were looking for a job?

no help at all ———————————— very helpful

How upset would you be if this person unfriended you?

not upset at all ———————————— very upset

If you left Facebook for another social site, how important would it be to bring this friend along?

would not matter ———————————— must bring them

Predictive Intensity Variables	Distribution	Max
Wall words exchanged		9549
Participant-initiated wall posts		55
Friend-initiated wall posts		47
Inbox messages exchanged		9
Inbox thread depth		31
Participant's status updates		80
Friend's status updates		200
Friend's photo comments		1352
Intimacy Variables		
Participant's number of friends		729
Friend's number of friends		2050
Days since last communication		1115
Wall intimacy words		148
Inbox intimacy words		137
Appearances together in photo		73
Participant's appearances in photo		897
Distance between hometowns (mi)		8182
Friend's relationship status	6% engaged 32% married 30% single 30% in relationship	

Duration Variable	Distribution	Max
Days since first communication		1328
Reciprocal Services Variables		
Links exchanged by wall post		688
Applications in common		18
Structural Variables		
Number of mutual friends		206
Groups in common		12
Norm. TF-IDF of *interests* and *about*		73
Emotional Support Variables		
Wall & inbox positive emotion words		197
Wall & inbox negative emotion words		51
Social Distance Variables		
Age difference (days)		5995
Number of occupations difference		8
Educational difference (degrees)		3
Overlapping words in *religion*		2
Political difference (scale)		4

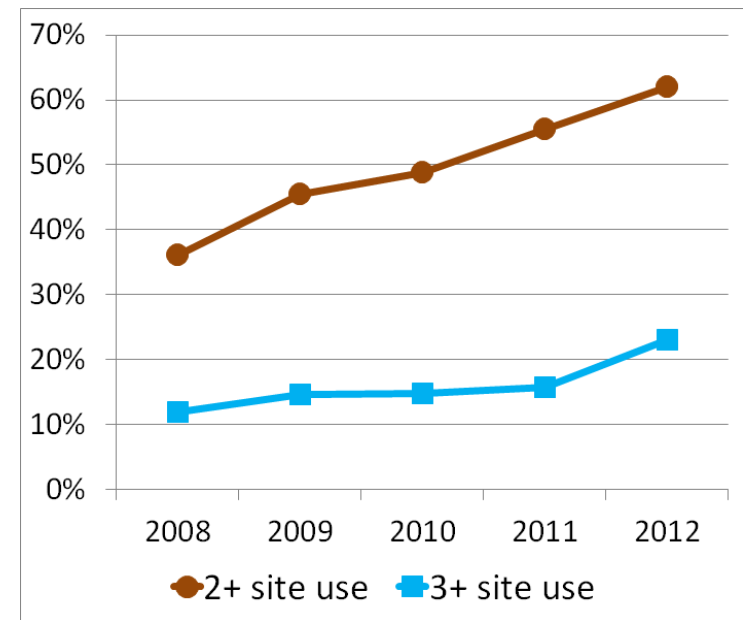# Signed Networks in Social Media

Summary

- In many online and offline contexts, ties can be signed.

- Reasons could span from trust/mistrust to voting and positive/negative perceptions of feedback and interaction

- First large-scale and quantitative validation of theories relating to signed ties
    - Two theories used: theory of status and theory of structural balance

- Focus on Epinions and Slashdot for examining explicitly defined networks, and Wikipedia for implicitly inferred networks

- Findings:
    - Theory of status explains signed tie formation in directed links.
    - Theory of structural balance explains the same in undirected social graphs.

Ties can be strong and weak, ties can be measureable through social media, and they can also be positive or negative. However, are ties contextual, e.g., demographic, topical, or situational?

Granovetter talks about the potential of weak ties to act as bridges. What would a bridge mean in the context of Twitter's social network?

Tell me some design implications of being able to infer tie strength in social media.

Zhang, H., De Choudhury, M., and Grudin, J. (2014). Creepy but Inevitable? The Evolution of Social Networking, CSCW 2014.
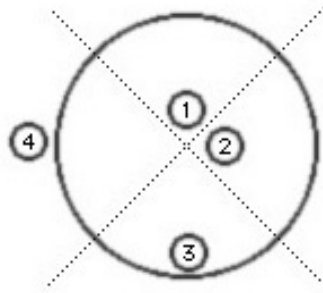
Today we use more and more types of networks, and our contacts are spread across them. What does therefore a strong (or weak) tie on one platform mean for the other?

The papers use the theory of cognitive and structural balance to reason about the existence of ties between people. Online networks surpass temporal and spatial boundaries. So does structural balance still explain how we form weak ties e.g., on Facebook?
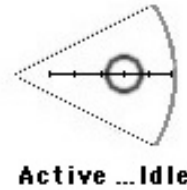
In Gilbert et al, structural balance i.e., number of overlapping networks was not found to be a significant predictor (unlike what Granovetter argues). What could be possible reasons behind this?

Social networks can be hierarchical, e.g., at an organization. How would definition of social ties and their strength be affected by organizational dynamics?

The first two papers do not talk as much about unidirectional ties. How would tie definition and tie strength differ in such contexts e.g., Twitter?

(a) proxy layout   (b) animation rule

The tool Babble: "Social Translucence: An Approach to Designing Systems that Support Social Processes"

Granovetter mentions that in ego-centric networks, strong ties form an inner circle, and weak ties form an extended circle

After all, in online context, interface design/ algorithmic manipulation may hugely impact whether a social tie eventually grows to be a strong or a weak tie. Cite some examples of this.

Are there situations where both strong and weak ties may be useful?

Burke, M., and Kraut, R. 2014. "Using Facebook after Losing a Job: Differential Benefits of Strong and Weak Ties". CSCW 2013.

- Losing a job is associated with increases in stress, while talking with strong ties is generally associated with improvements in stress and social support.

- Weak ties do not provide these benefits.

- Bridging social capital comes from both strong and weak ties.

- Contrary to the "strength of weak ties" hypothesis, communication with strong ties is more predictive of finding employment within three months

"Felt a little better with supporting comments about losing my job. My friends gave me a better outlook on the situation."

"Been able to share my worries, get help on Cvs, job hunting and general chit chat about whats happening to others."

"Much better it is way easier to stay connected when looking for employment t see what others found. If someone finds a lead they cannot use they pass it on in case anyone else can use it. We are finding jobs"

"Yes, [I] am able to commiserate with other colleagues on losing our jobs (due to Bank failure) and getting prospects for new opportunities."

Next class

- Monday 10/6
- Topic: Networks (Structure)
- There are assigned readings, due on Sunday 11:59pm on Piazza.
- **We will also have a discussion on Assignment II.**