





Social Influence and Social Media

Dr. Kathleen M. Carley
kathleen.carley@cs.cmu.edu

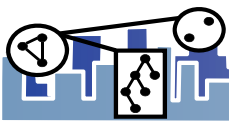
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Social Influence

- Change in behavior and/or beliefs of ego due to
 - The network of relations in which ego is embedded
 - The behavior and/or beliefs of alters

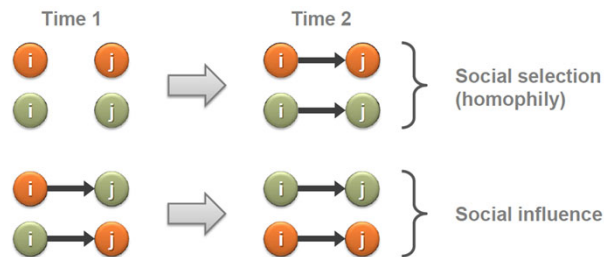


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Social Selection, Social Influence

- Social selection: Bob & Jane become friends because they share certain characteristics
- Social influence: Because they are friends, Bob comes to share Jane's characteristics
- The two are very difficult to distinguish looking at a single point in time



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Friedkin Formal Model

$$\mathbf{Y}^{(1)} = \mathbf{X}\mathbf{B}$$

$$\mathbf{Y}^{(t)} = \alpha\mathbf{W}\mathbf{Y}^{(t-1)} + (1-\alpha)\mathbf{Y}^{(1)}$$

$\mathbf{Y}^{(1)}$ = an $N \times M$ matrix of initial opinions on M issues for N actors

\mathbf{X} = an $N \times K$ matrix of K exogenous variable that affect \mathbf{Y}

\mathbf{B} = a $K \times M$ matrix of coefficients relating \mathbf{X} to \mathbf{Y}

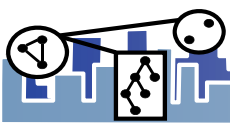
α = a weight of the strength of endogenous interpersonal influences

\mathbf{W} = an $N \times N$ matrix of interpersonal influences

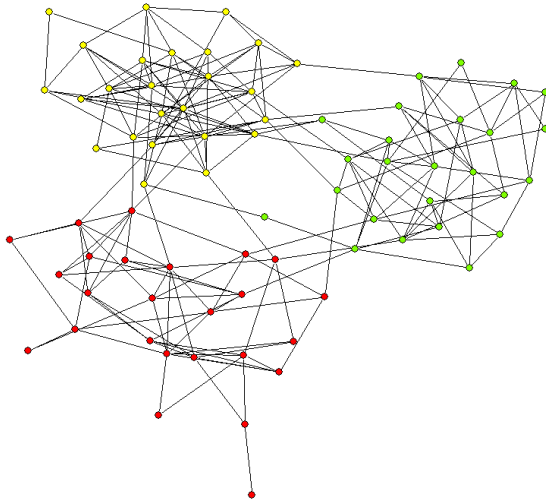
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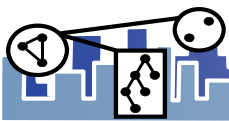
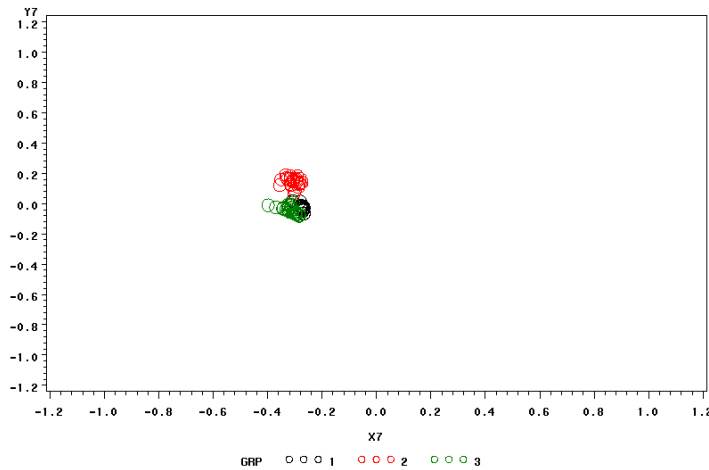
Basic Peer Influence Model



- Extended example: building intuition
- A network with three cohesive groups, and an initially random distribution of opinions

Social Influence

Your Beliefs are a Function of the Beliefs of those in Your Network



Social Cognition

- Heuristics and cognitive biases humans use to make sense of vast quantities of data in terms of groups
- Generalized other
 - What everyone knows (but no one person knows all)
- Generalization
 - From the specific to the group
- Stereotyping
 - From the generalized group to the individual
- Discrimination/Differentiation
 - Ability to recognize differences in groups

Social Influence and Social Cognition

- Individuals change beliefs to become more like those in their salient sphere of influence
- Salient Sphere of Influence
 - Some individual actors
 - Some generalized others for salient groups
 - Ignores non-salient others and groups (made possible through discrimination)
- If you can impact who is in someone's salient sphere of influence, you can impact their beliefs

Who's on Social Media?

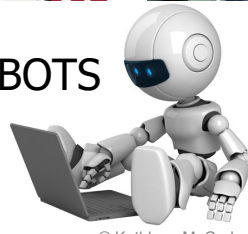
• Organizations



• Individuals



• BOTS

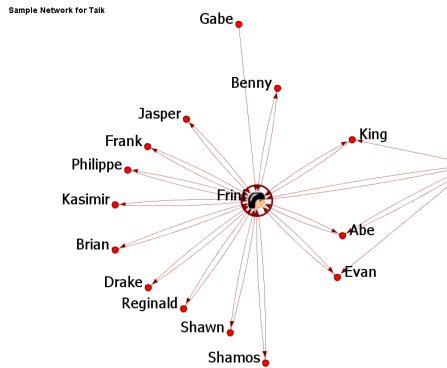


Key Ideas

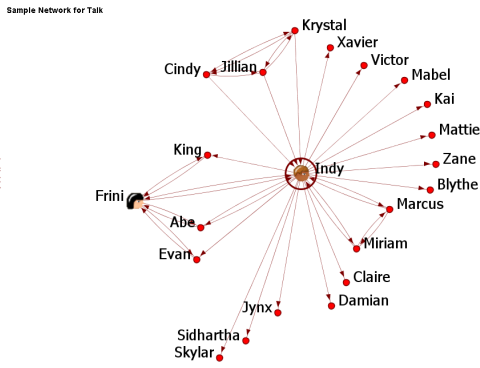
- Super-spreader
 - A communicator who has exceptional ability to spread information
 - In social media, this is measured by a combination of communicates frequently, frequently followed, frequently mentioned, crosses between platforms
- Super-friends
 - A communicator who is exceptionally involved in dialogue with others (reciprocal communication)
 - In social media, this is measured by a combination of frequent co-mentions, mutual following, mutual re-tweeting, etc.
- Echo Chamber
 - A group of users and topics that are strongly interconnected at both the social and the knowledge level
 - In an echo chamber ideas reflect back and forth through reciprocated links confirming what everybody knows and escalating emotions

Social Influence

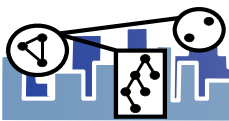
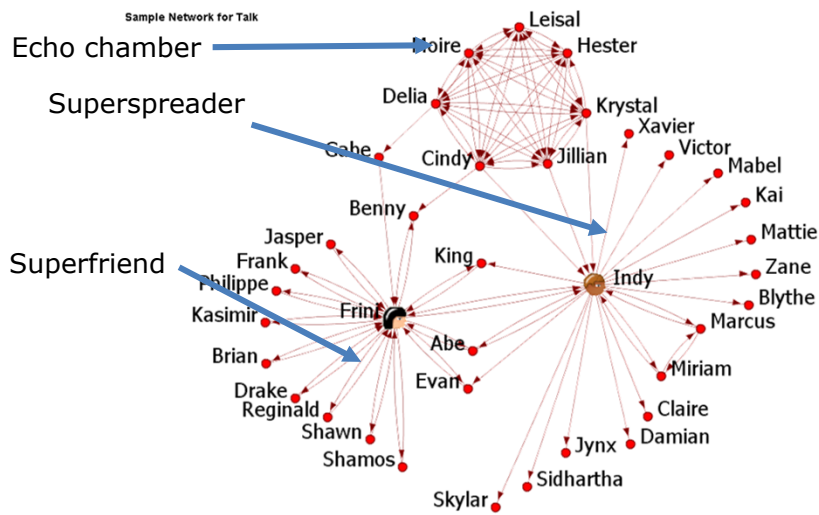
- Influences 14
- Influenced by 15



- Influences 18
- Influenced by 7



Social Media is About Networks



Social Media is Organized into Topic-groups



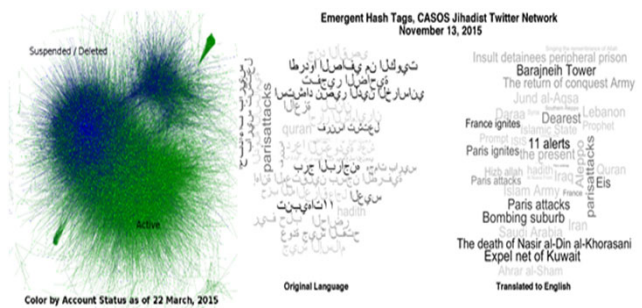
Talk to each other about same topic

Pathological form – the echo-chamber



Echo Chamber

- A group that exhibits high connectivity in the community and content space
- This high level of connectivity leads to:
 - a lack of objectivity
 - a focus on common stories
 - a sense of sharing
 - suspicion or hostility to newcomers with different narratives
 - rapid interaction with others with similar narratives.
 - Prone to amygdala hijack



What is Manipulatable

Posts, content

--- features of these affect, emotional cues, presence of memes, images, font, cohesiveness ...

Narrative



Actors, groups

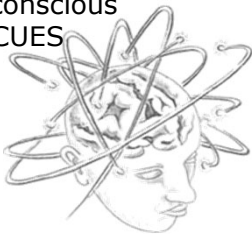
--- features of these network structure, position of opinion leader, interaction between groups ...

Tools used in Influence Campaigns

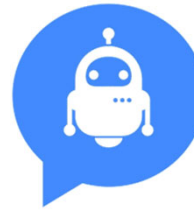
MEMES ARE AWESOME!



Subconscious CUES



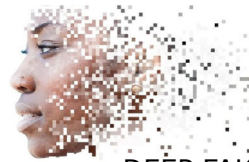
BOTS



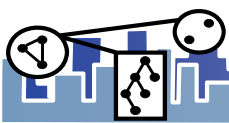
CYBORGS



DEEP FAKES



TROLLS



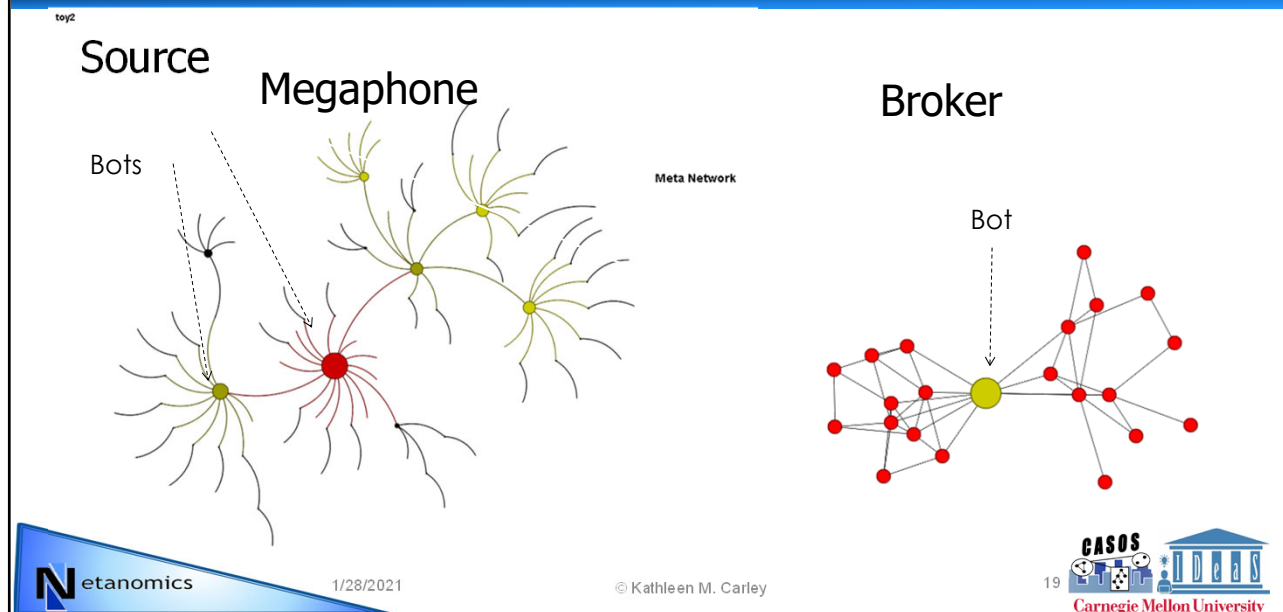
Influence Campaigns Exploit Technology Your Mind & Your World View

- Internet & Social Media: Technology
 - Scroll through technology
 - Frequent or repeated at top
 - Infrequent at bottom
 - Prioritization
 - Which followers get messages
 - Which topics & actors get recommended
 - Appears to take into account group density and opinion leaders
 - What answers you get to your searches
 - Abandoned accounts
 - Re-purposed
- MIND: Cognition & Emotion
 - Confirmation bias
 - Fear or Flight Reflex
 - Escalation of commitment
- World View: Social Cognition
 - Create apparent consensus
 - relying on the generalized other
 - Create groups – us/them
 - Stereotype
 - Infer from individual to a group

Bot Types

- Amplifier
- News bot
- Random
- Builders
- Evil Twin
- Disruptor
- Announcer
- ... and possibly others
- Humans can pretend to be bots
- Bot technology evolving
 - It is easier to pretend to be human
- Bots are not bad
- Bots can be useful

Bots can be Megaphones or Brokers



Linking Social Media to Real World

- People with reciprocated social media ties are more likely to have real world tie 73%
- Stronger links, reciprocated ties, more likely to be used for controversial information or personal information
- News or entertainment – equally likely on any tie
- Real world networks are more “perfect” than on-line – more dense, fewer “hangers on”
- So ...
- Online topic groups often have a real world group, real world group more of an echo-chamber
- Sending messages to excite an existing topic group results in longer half-life of message

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CASOS Carnegie Mellon University

Social Influence Bots

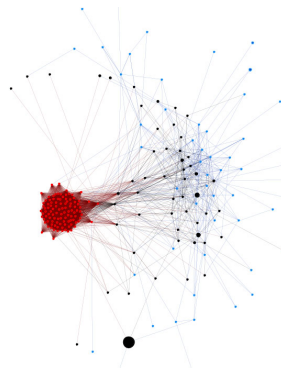
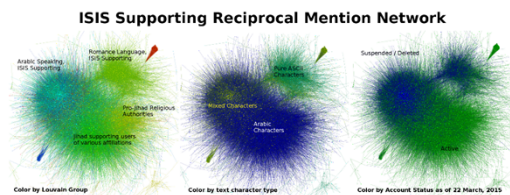
- Create an echo chamber
- Gain entry through linking to superspreader
- Appear as superfriend
- Tricks twitter
 - into recommending
 - Prioritizing messages
- Alter message by promoting benefactor



Firibinome bot – dense network built through mentions

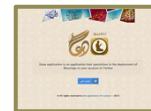
Bots Can Manipulate Community Structure

Syria Focused Extremist Topic Group
"Dense Community"



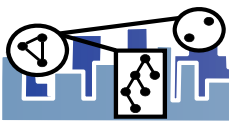
Core Firibi Bot

Firibi Benifactor

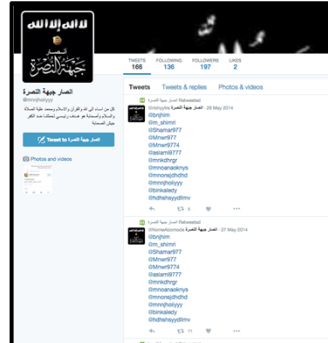
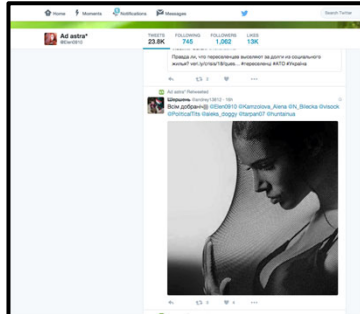


App Sign Up, solicits donations for children of Syria

Firibi Follower



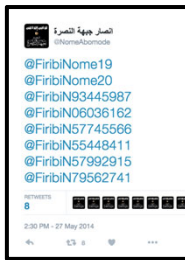
Spreading Narratives



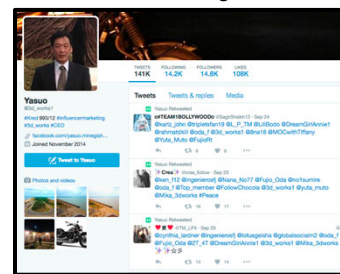
Sophisticated use of @mentions can be used to increase size and interconnections within topic groups

Influence Manipulation with Social Influence Bots

FiribiNome Social Botnet
Purpose: promote du3a.org



#Influencemarketing, #Kred:



Euromaidan Image Sharing
Purpose: Build community of young males

Sophisticated use of @mentions can be used to grow communities, gain influence, or promote accounts



Bots Building Community

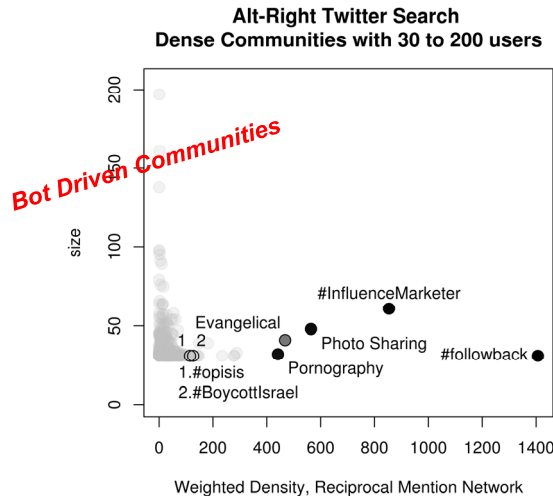
- Two distinct topic groups
 - Alt-right topic group
 - Evangelical topic group
 - Appear to be middle aged American Women
 - Both have a core agenda
- Both densely connected

- Social bot used in connecting groups
 - Makes it appear that each group is in favor of other's agenda
 - Might be bridging the evangelical community with a particular candidate
 - Might be simulating a fake grass-roots movement

Using Community

- SI-bots
 - Follow general opinion leader
 - Increasing the spread of the message
 - Mention each other
 - Create the appearance of wide spread agreement to follow opinion leader
 - Causes Twitter to recommend the "benefactor" accounts
 - These accounts can contain apps
 - If you join they then tweet from your account
 - Increasing the appearance of wide spread agreement
 - Scroll through technology puts most recent on top
 - High volume of posts ensures much to scroll through
 - Without constant attention and groveling through "old" material – you don't even see that your account is being used

Creating Apparent Consensus Through Topic Group Grooming



- Black circles were manually identified as SI-Bots
- All have political agendas
- Many others have this bot-like behavior
- Large size gives the impression of "everyone"
- Evangelical women's group grooming

Analyzing Content

- Content Analysis
 - Counting words
- Key Entity Analysis
 - Language technology for finding people, organizations, locations
- Topic Analysis
 - Identifying groups of "concepts" and documents that go together
 - Latent Dirichlet Analysis - LDA
 - Latent Semantic Analysis - LSA
- Sentiment Analysis – local and general
- CUE Analysis
- Theme Analysis
 - Identifying things that fit together vis a focus or a strategy

Key Theories

- Rhetorical Power
 - Use of words that get you to think about many different things, that are frequently used, that are related to many things – e.g. stereotypes
 - Messages with words with more rhetorical power have greater reach
 - In social media, create power by co-mentions and frequent mentions
- Conversational Drift
 - Shift from one topic to another – natural – due to half life
 - In social media, speed the process by what topics you choose
- Cognitive Dissonance
 - Feeling of unease due to discussions that are at odds with what you expect
 - Lead to increasing emotional stress, and either greater commitment to group or leaving of group
 - In social media, create dissonance through information strategies that lead to apparent contradictions

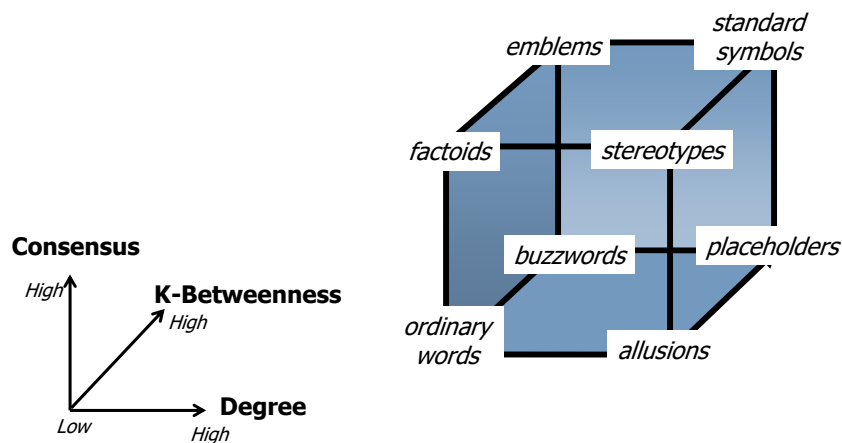
Associated Information Strategies

- Apparent Consensus
 - Make it appear that there is wide spread agreement
- Shift Attention
 - Overwhelm the information space
 - Create competing topic
- Encourage Disassociation
 - Present false information
 - Making fun of

Rhetorical Power

- Concepts are high in rhetorical power if they meet one or more of these criteria
 - Are frequently used by many people
 - E.g. #Trump
 - Are part of many conversations
 - Evokable & or Invokable
 - If used, makes you think of many other things
 - E.g., use of #NATO might evoke responses in
 - Many things that are said make you think of this
 - #Trump
 - Are frequently cycled through
- Stereotypes, allusions, symbols ... have high rhetorical power

Cube analysis of communicative power



Building Apparent Consensus

- Using concepts high in rhetorical power makes everybody think they understand what you are talking about
- Creates the appearance of consensus
 - E.g., we all agree that democracy is good
 - But we all mean different things by democracy
- Build grass roots support using messages in which concepts with rhetorical power are used

Conversational Drift

- Conversations drift natural
- In general most “topic-groups” grow and change in response to real world events
- Encourage drift by
 - Spamming a large number of topics
 - Tricking twitter into prioritizing your message
 - Linking your message to existing topic – threadjacking
 - ...

Conversational Drift is Diagnostic

- After a disaster when is the situation normal again?
 - When people start tweeting about Justin Bieber
- When is a situation critical
 - When it has a disproportional half-life
- Are people interested in you
 - How long do people stay on your issue?

Cognitive Dissonance

- This makes me feel uncomfortable !!!
- People naturally try to reduce cognitive dissonance
 - Change yourself
 - Change who you interact with
- Creating cognitive dissonance
 - Strategy to build allegiance to a group
 - Strategy to rid the group of those you don't want

Creating Cognitive Dissonance In Social Media

- Use of “off-color” humor
- Use of images
- Fake news
- Using URLs linked to fake news
- but strategy has to be used “surgically”
- Key is to create dissonance only sometimes

Seeing Top Actors

- Twitter report
- Take top person
 - Compare super-spreader and super-friend
- Run sphere of influence visualization – what do you see
- Take top person
- Run total degree over time – What do you see

Finding Topic Oriented Communities

- BEND report
 - Either let report find groups – or put in groups of interest
- Use stance to find groups
- Use MVMC to find groups

Assess conversation

- Communicative power report