

ONLINE SOCIAL NETWORKS

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WHERE ?

- Social media
- Web content in general
- Other internet protocols and applications



WHERE ?

- Social media
- Web content in general
- Other internet protocols and applications

The image shows a screenshot of a social media conversation on the left and a news article on the right. The conversation includes three messages from users TURBINE, VENTDEST, and CRISALYON. The news article is titled "Setting the Record Straight: More from our Canadian Cousins" and features a video player with a play button. A red arrow points from the video player to a handwritten letter 'U', and a blue arrow points from the text of the article to a handwritten letter 'W'.

138 suivent la conversation

TURBINE · 7 AVRIL 2014 À 0:9
"Le Jour de colère fait pschitt."
... A l'orange, ou au citron ?...

VENTDEST · AVRIL 2014 À 0:1
Que de mots pour dire qu'à ce rassem
En écrivant peu , on pouvait en dire be

CRISALYON · AVRIL 2014 À 23:51
On ne me voit pas sur la photo... J'étais
Piloyable, cette manit... des têtes d'ent
s'éclate pas dans les rangs... et, ce qui
Et ce slogan - pédo criminalité LGBT...
pédophile ? Alors quel rapport ?
Bon... ils m'ont bouzillé une heure d'un
plus) pour la manit (le cortège des cam
faire le tour par la Chouliane parce qu'ils

7 commentaires à Des projets open-source qui changent le monde

Chouette article Brian, un joli petit bol d'air au milieu d'une actualité assez mesurée.

Article écrit le 26 mai 2014 à 11:16 · Répondre · Signaler un abus

Article écrit le 26 mai 2014 à 22:30 · Répondre · Signaler un abus

Et alors, Anne-Sophie Noël partage ce qu'elle a ressenti d'un événement (lire) ces grands événements politiques les médias manquent et ça pourrait se faire... (lire) vraiment pertinent pour construire des alternatives à responsabilité collective et pour une responsabilité collective.

Setting the Record Straight: More from our Canadian Cousins
Written by Robert Justin Lipkin on August 26th, 2009

Universal Health Care Message to Amer...
★★★★★

Listen to some more. Finally, Canadians are fighting the slanderous characterizations of the Canadian health care system by U.S. insurance companies and other ideologues. As stated, medical care is a human right, not an economic product to be evaluated simply in terms of the bottom line. We, Americans, would do well to heed the advice of our northern cousins. But we also need more help from Canada in setting the record straight about its own system and pointing out the systematic attempt on the part of those Americans opposing health insurance reform to distort, obscure and simply lie about the Canadian system. Click here for more.

U W

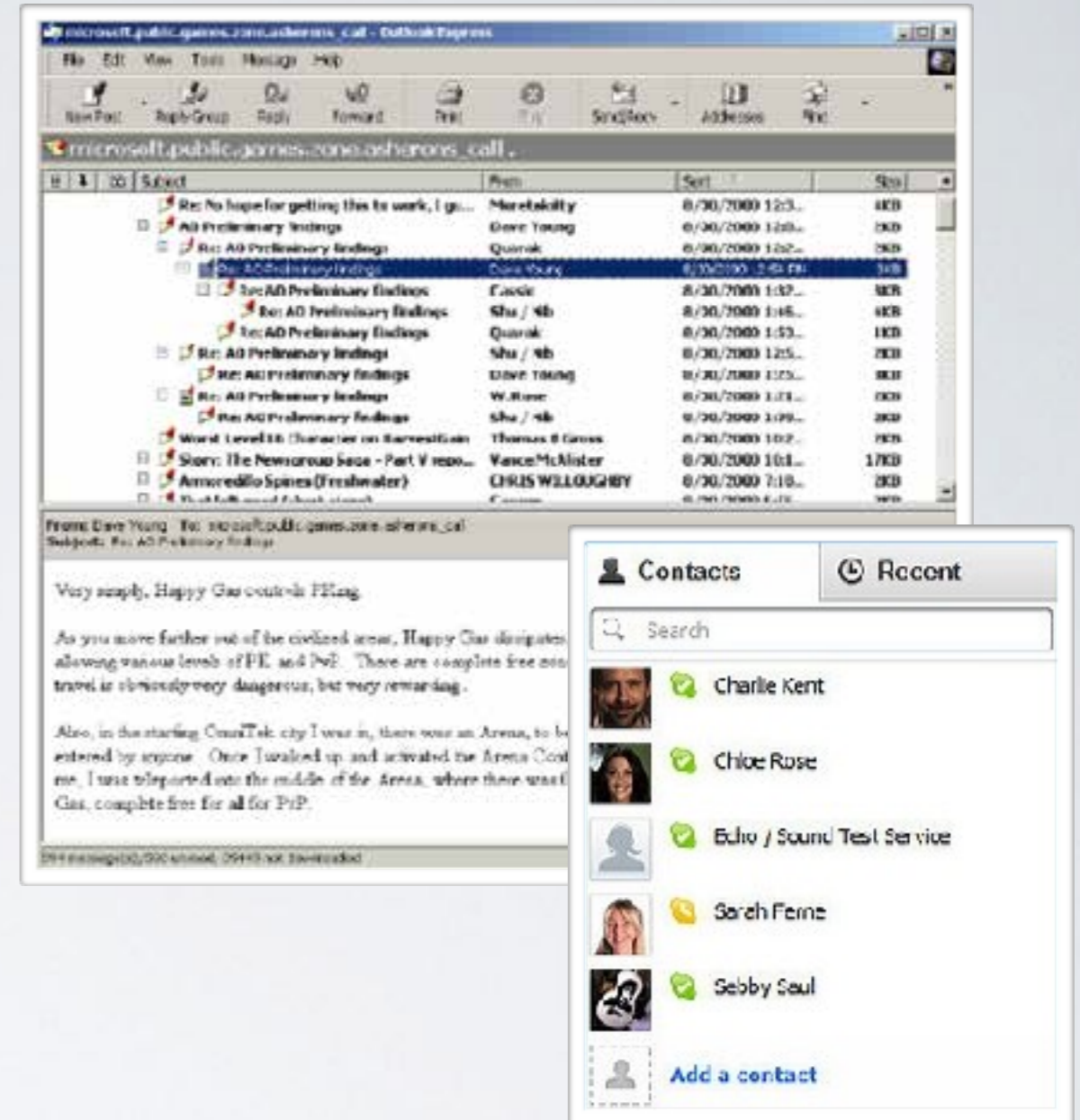
WHERE ?

- Social media

- Web content in general

- Other internet protocols and applications

USENET (discussion forums), emails, messengers



WHAT ?

- **Confirmed reciprocal connections**
- Formal links
- Implicit networks



WHAT ?

- Confirmed reciprocal connections

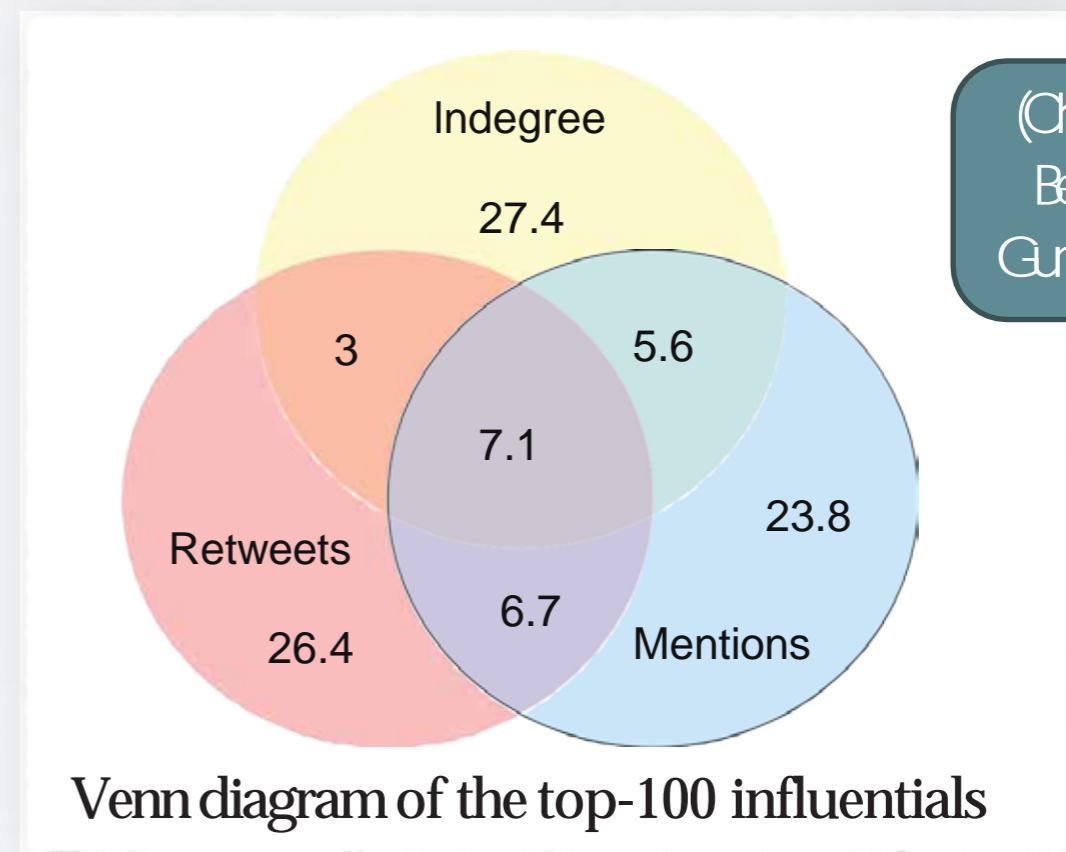
- Formal links

- Implicit networks



WHAT ?

- Confirmed reciprocal connections
- Formal links
- **Implicit networks**



(Cha, Haddad,
Benevenuto,
Gummadi 2010)

WHAT ?

"Expressing Social Relationships on the Blog through Links and Comments"

(Al-Hasan, Adams, 2005)

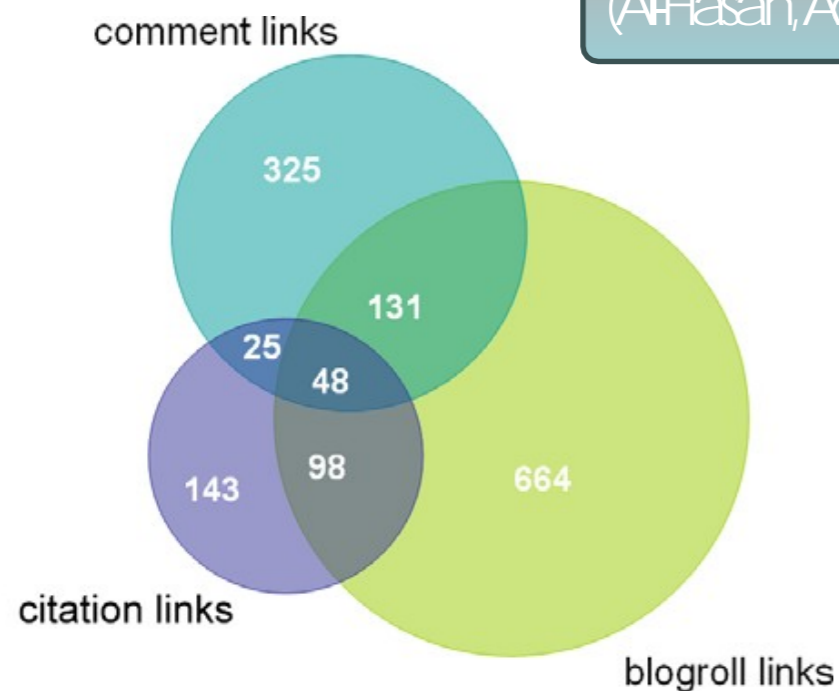
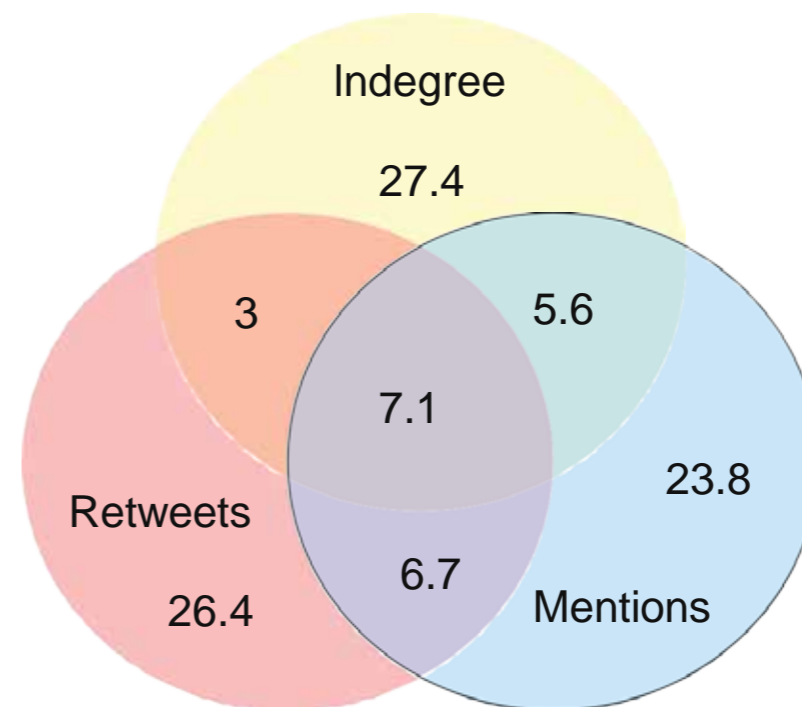


Figure 1. Venn diagram illustrating the overlap in different types of blog ties (comments, blogrolls, and citations) for Kuwait Blogs.

Local connections

- **Implicit networks**



Venn diagram of the top-100 influentials

(Chahar, Haddad, Benevenuto, Gummadi, 2010)

"Expressing Social Relationships on the Blog through Links and Comments"

(Al-Hasan, Adamic, 2005)

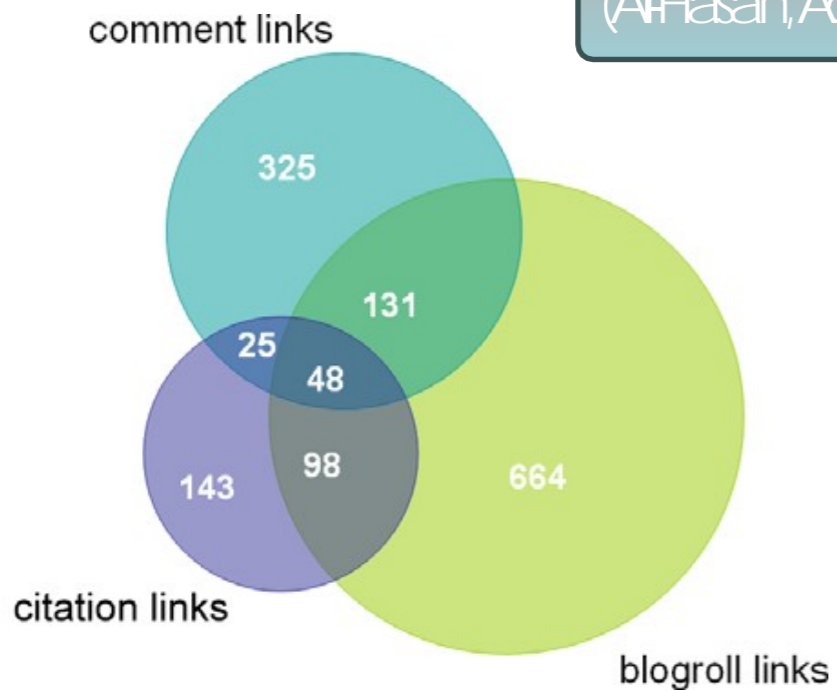
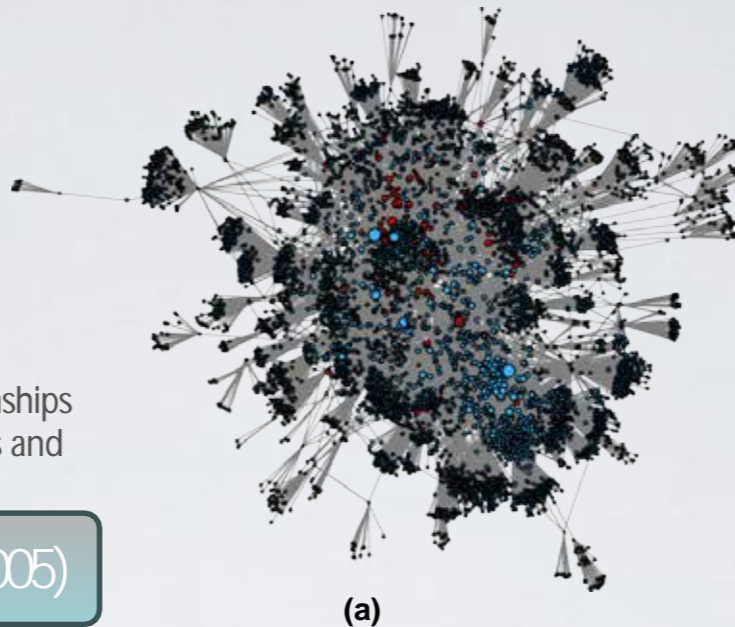
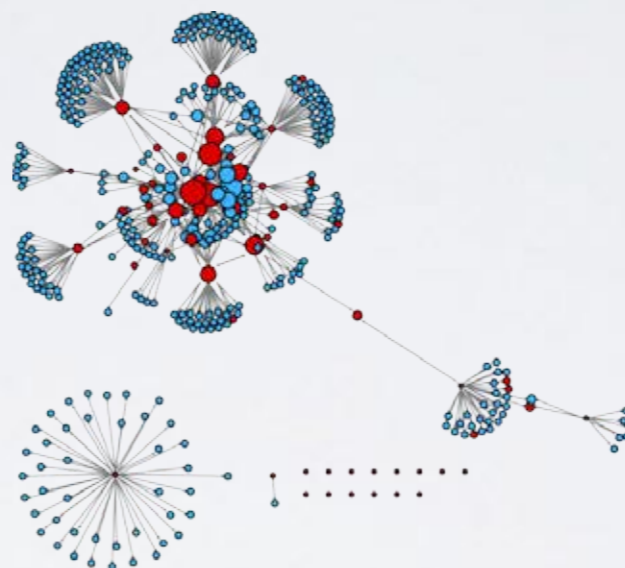


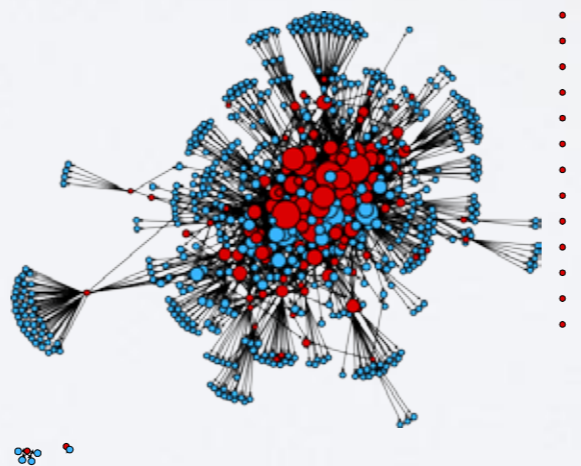
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(a)

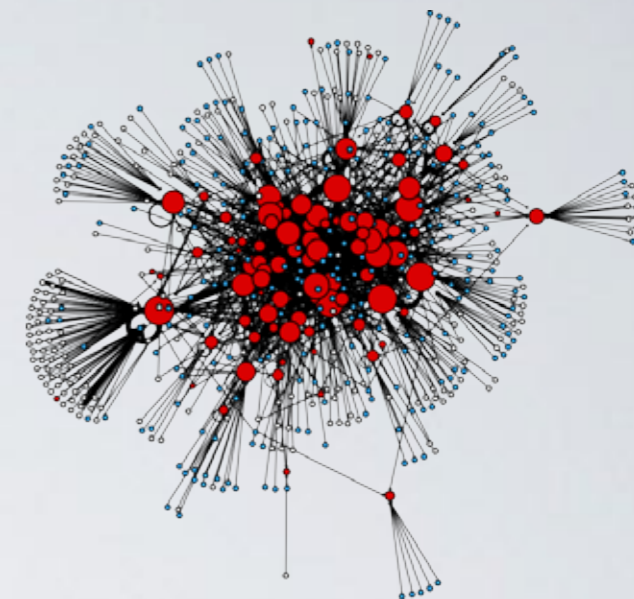


(b)

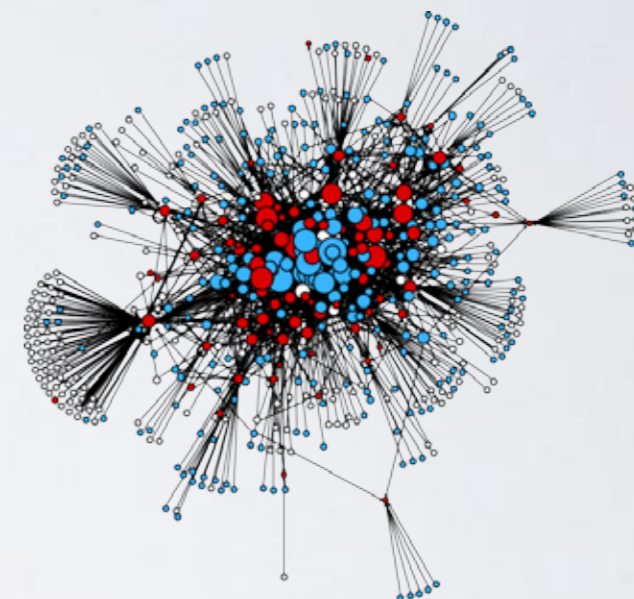


(c)

Figure 3. Blogroll and citation links for (a) DFW, (b) UAE, (c) Kuwait. Nodes are colored red if they are in the community and are sized by indegree.



(a)

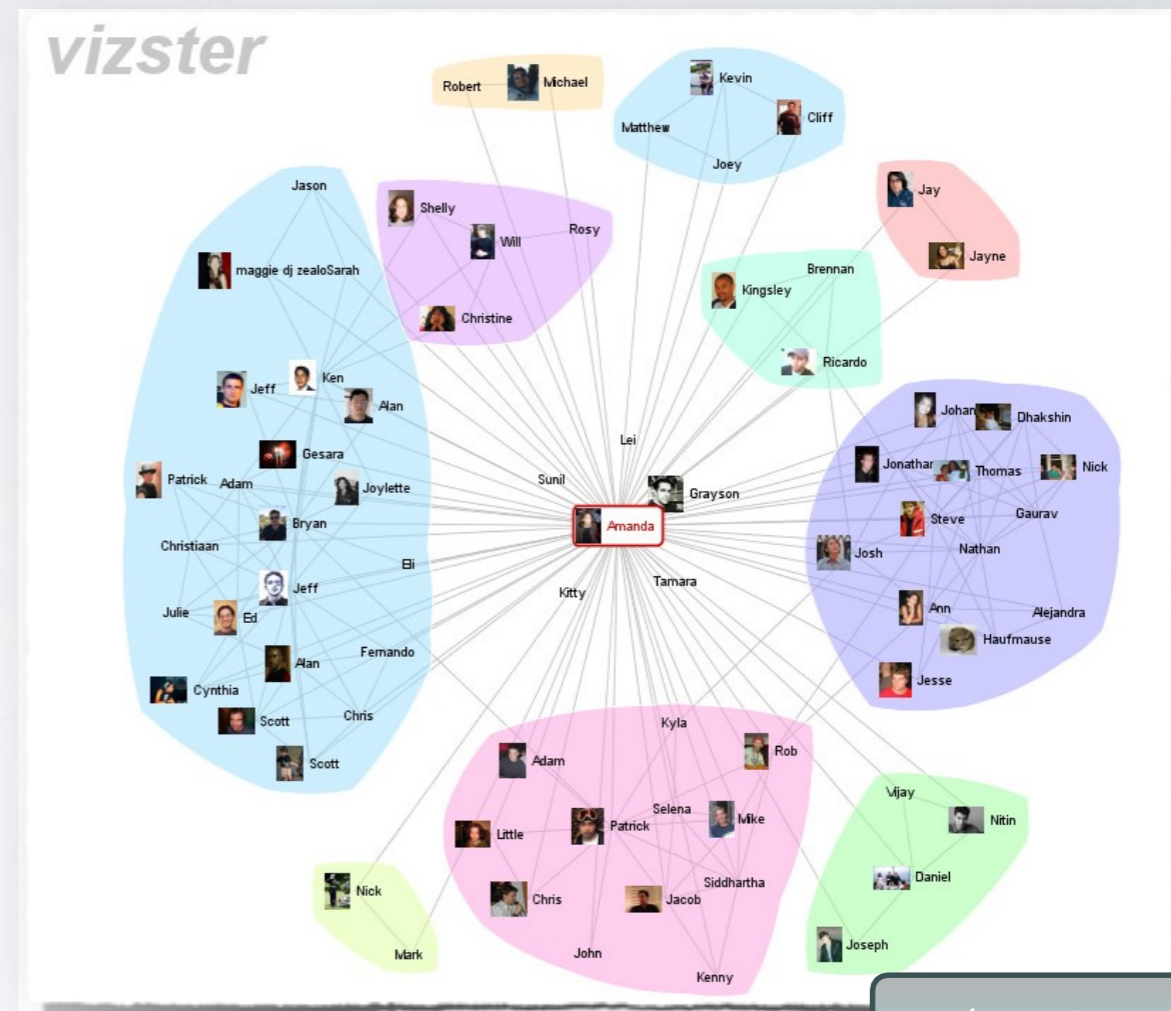


(b)

Figure 5. The network of comments in Kuwait blogs. Nodes are sized by (a) how many people commented on their posts (indegree) and (b) how many posts they left comments on (outdegree). The color of the nodes corresponds to their status in the community: Kuwait Blogs are red, other blogs are blue, and anonymous authors or non-bloggers are white.

COLLECTION PROTOCOLS

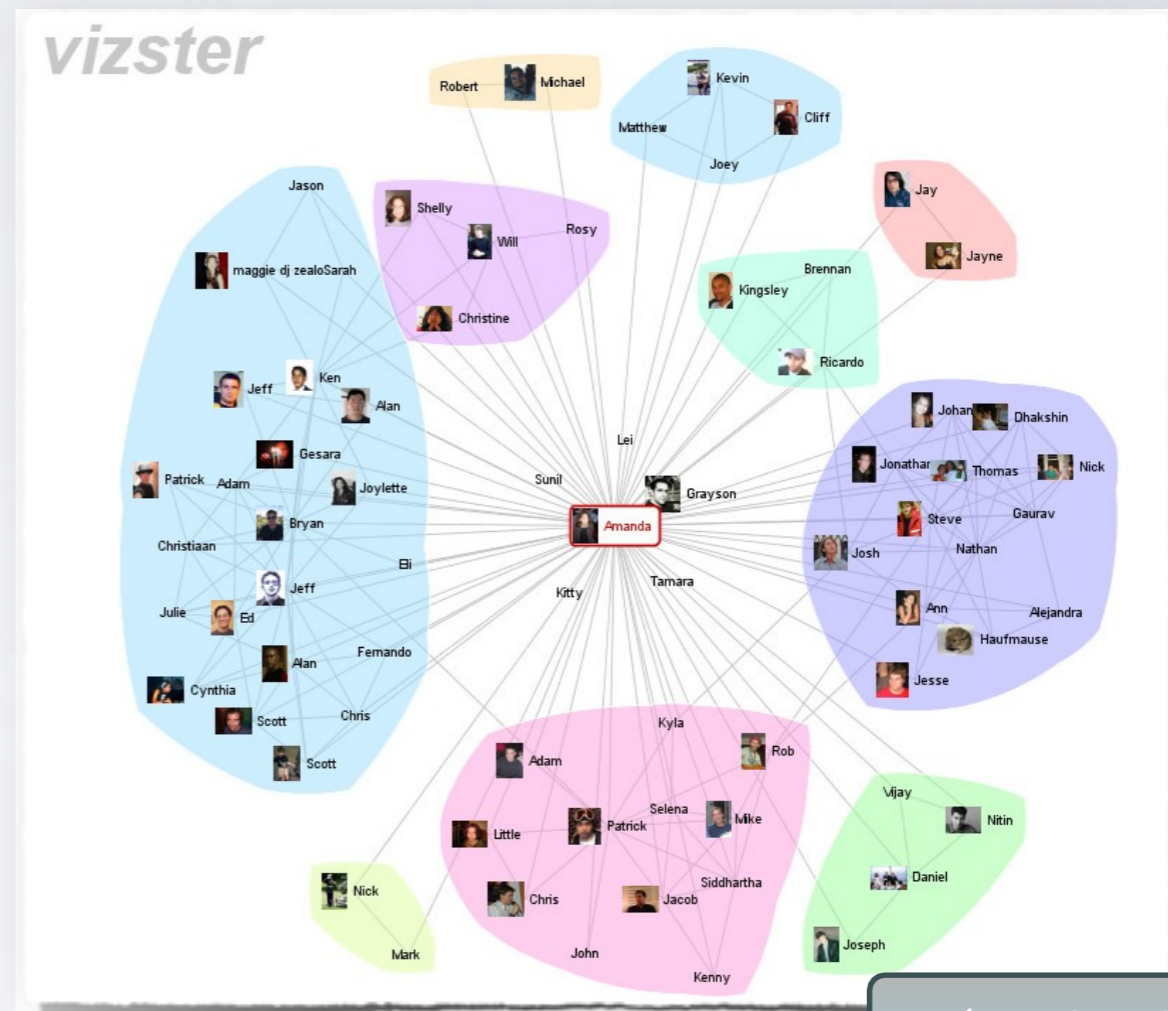
- ego-centered
- snowball
- holistic



(Heer, Boyd, 2005)

"Vizster: Visualizing Online Social Networks"

COLLECTION PROTOCOLS



(Heer, boyd, 2005)

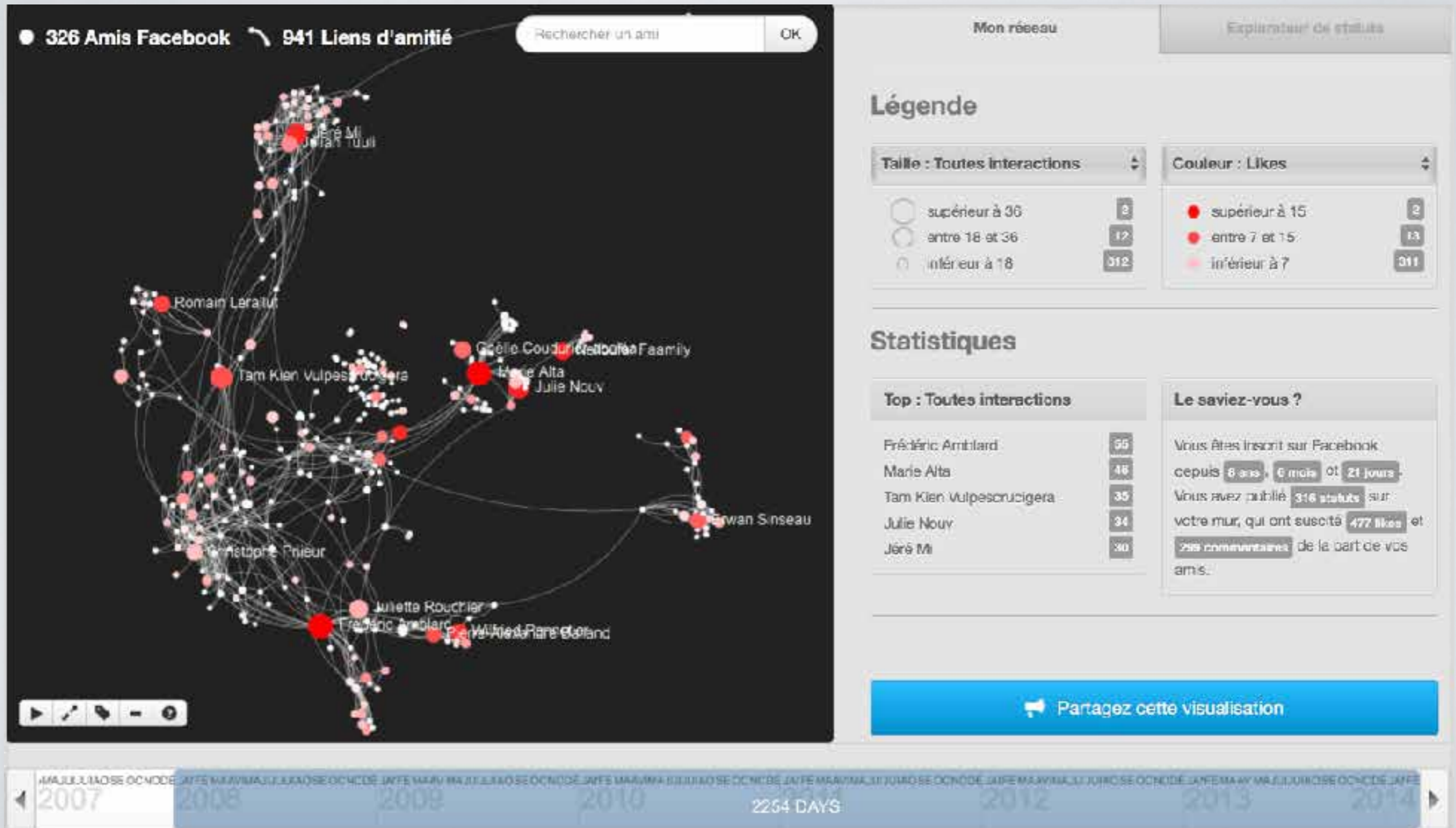
"Vizster: Visualizing Online Social Networks"

COLLECTION PROTOCOLS

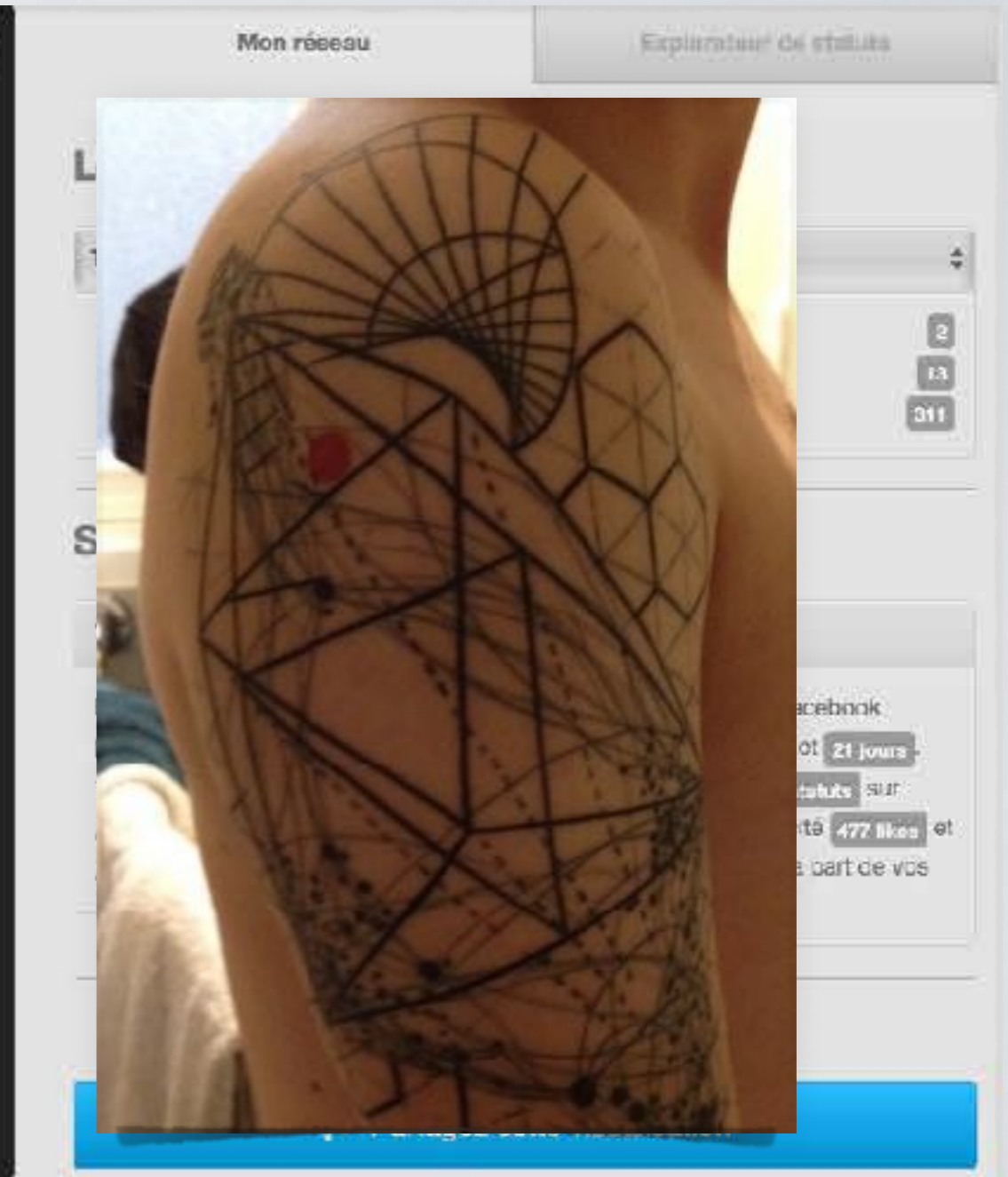
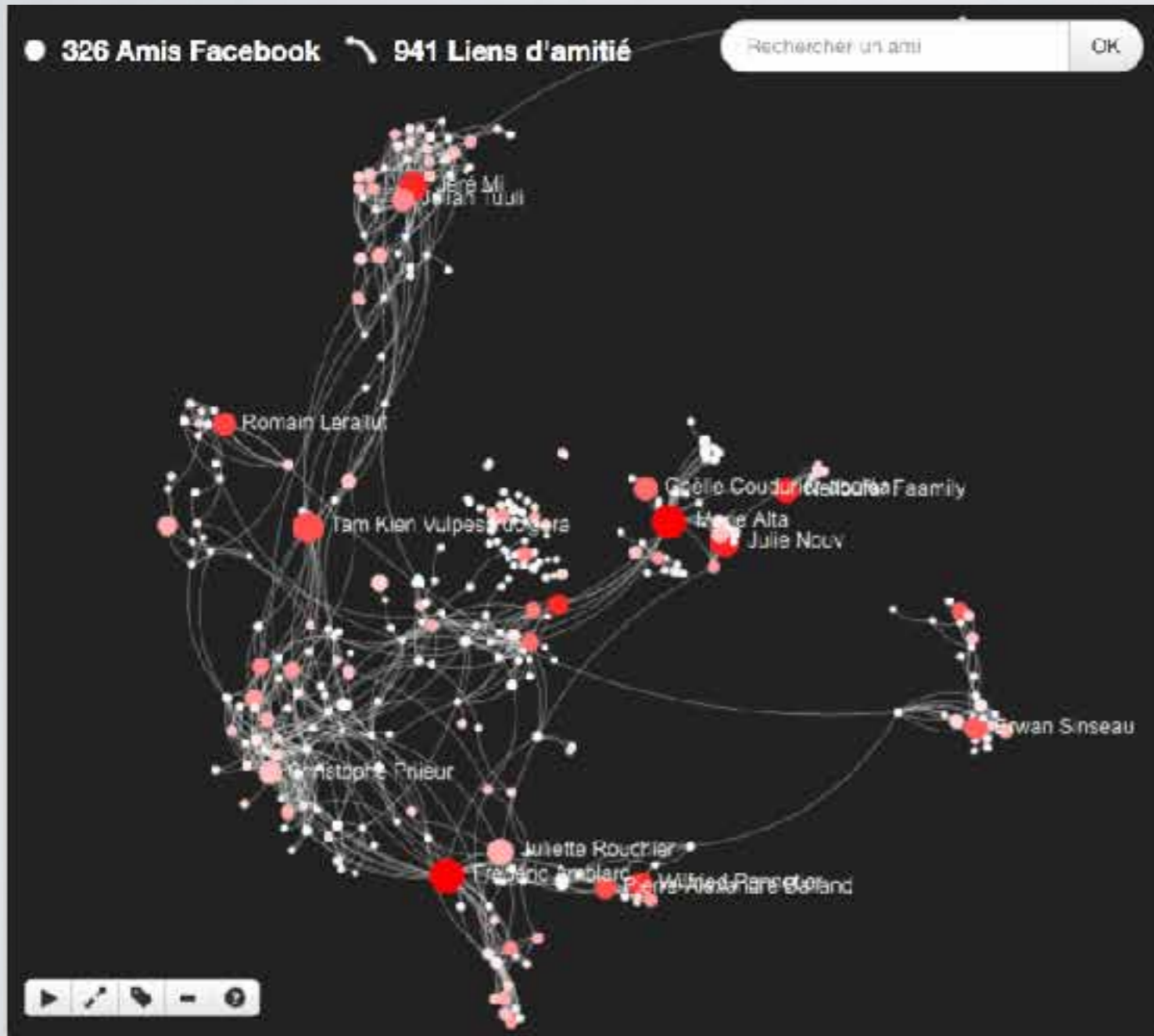
- ego-centered
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- holistic



COLLECTION PROTOCOLS

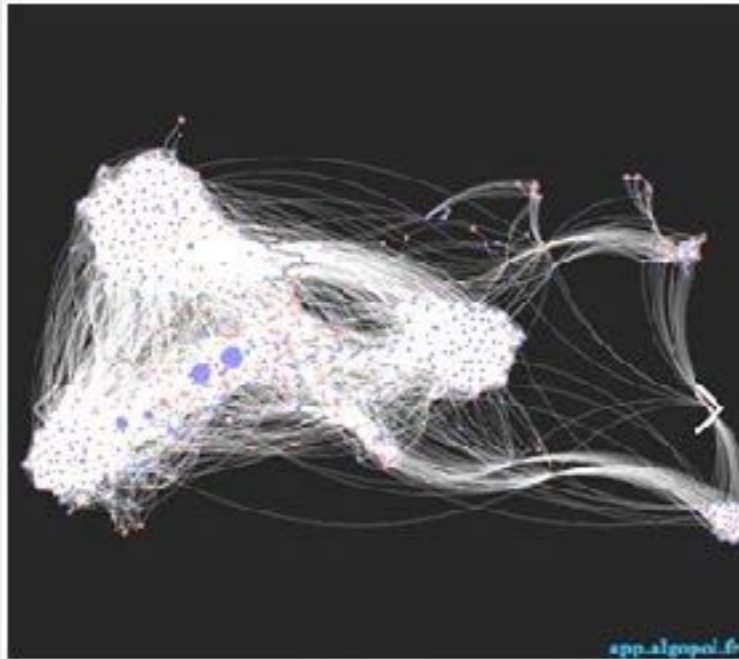


COLLECTION PROTOCOLS

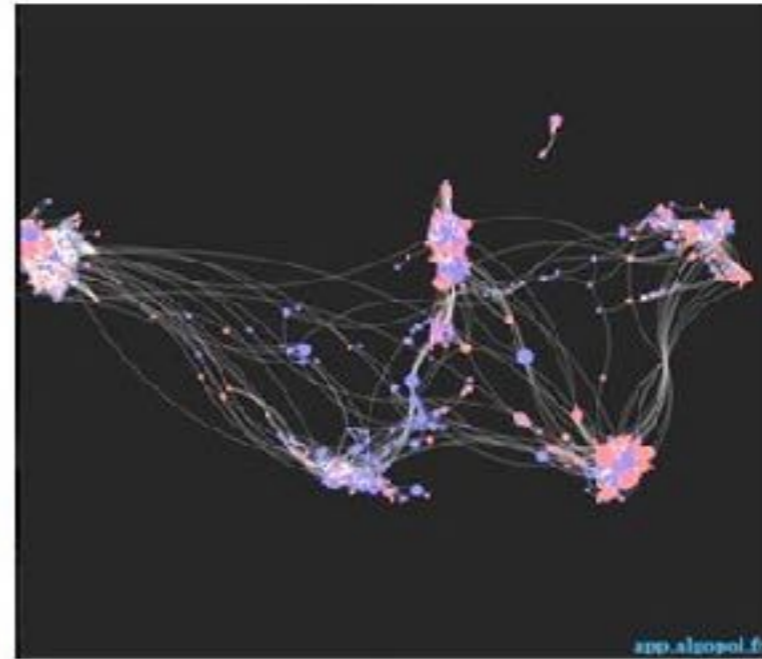


COLLECTION PROTOCOLS

Dans la famille des "animaux" Algopol



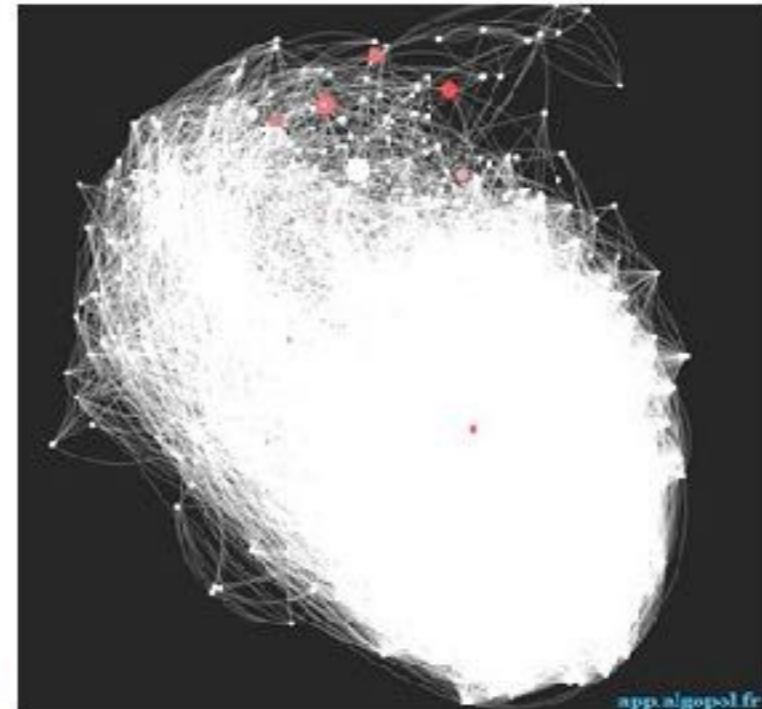
Pieuvre



Papillon



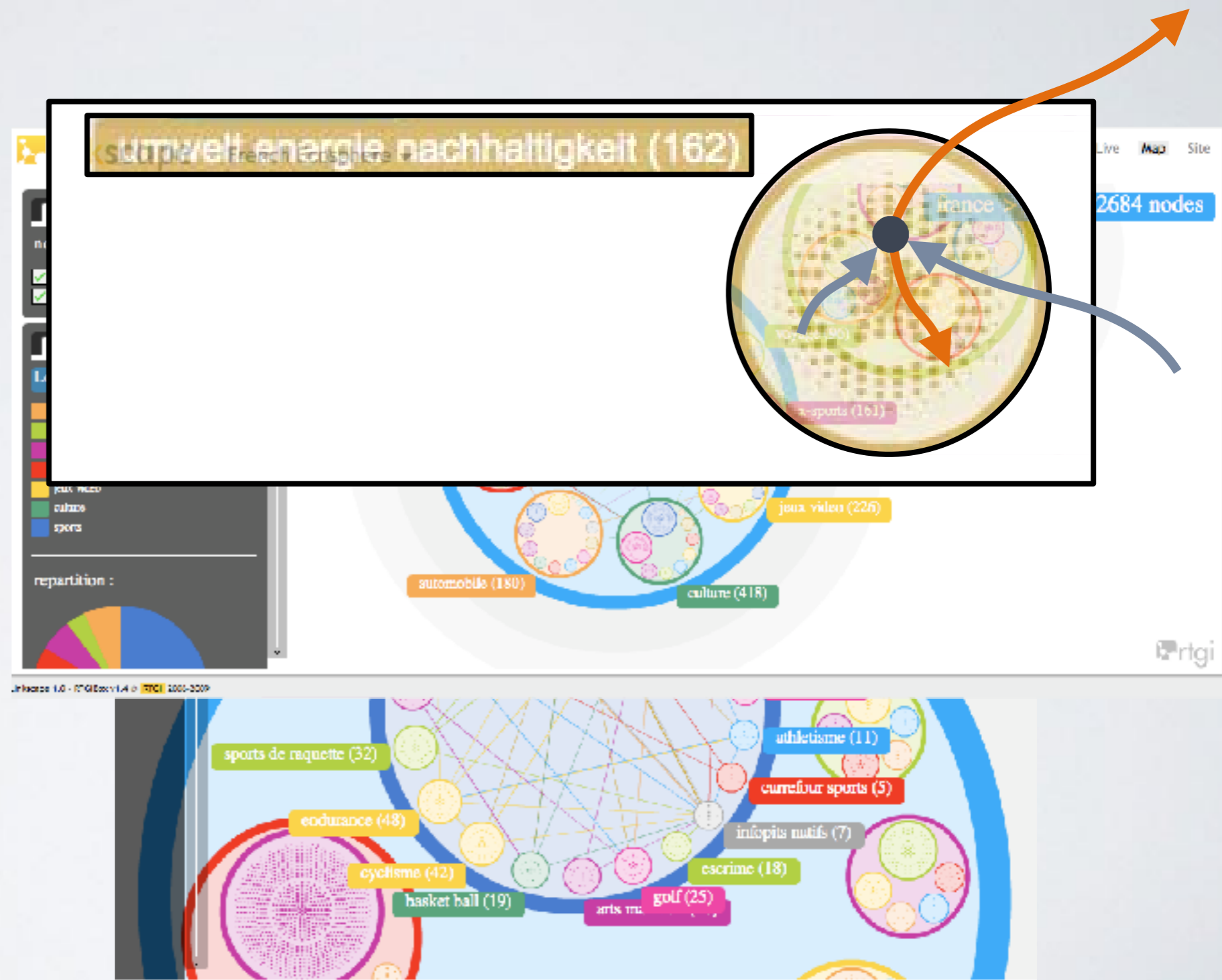
Libellule



Hérisson

COLLECTION PROTOCOLS

- ego-centered
- snowball
- holistic



COLLECTION PROTOCOLS

- ego-centered
- snowball
- **holistic**

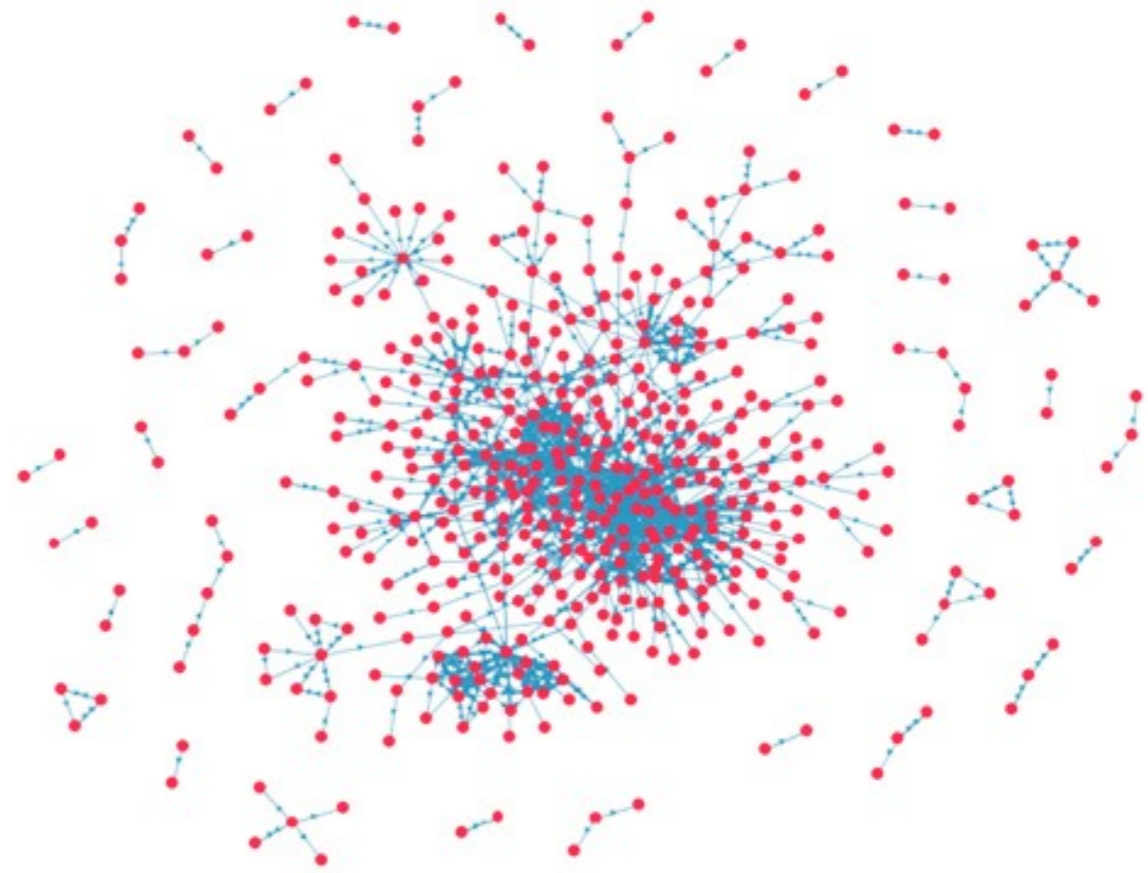


Figure 2: The FilmTrust social network.
Users who are not connected into the main component and are seen in the small clusters scattered around the edges.

(2007)

The dynamics of Web-based social networks:
Membership, relationships, and change

by Jennifer Golbeck

COLLECTION PROTOCOLS

(Comover, Ferrara,
Menczer, Flammini, 2013)

"The Digital Evolution of
Occupy Wall Street"

To identify Occupy-related content, we deem relevant any tweet containing a hashtag matching either #ows or #occupy*, where * represents a wildcard character. This set includes high-profile tags such as #occupy as well as location-specific tokens such as #occupyoakland and #occupyseattle. While this approach does not allow us to study content that does not contain an Occupy-specific hashtag, we argue that it is appropriate for two reasons. As outlined above, hashtags allow a user to reach an audience beyond his or her immediate followers, and it is this kind of expressly public engagement in which we are primarily interested. Moreover, while topic modeling techniques may allow for the analysis of untagged tweets, their use would introduce noise that could cloud the interpretation of any analytical results [30]. Based on the criteria outlined above, we produce a corpus of all sampled tweets containing at least one of these hashtags from the year-long period between September 1st, 2011 to August 31st, 2012. Referred to hereafter as the *Occupy corpus*, this dataset contains approximately 1.82 million tweets produced by 447,241 distinct accounts.

- ego-centered
- snowball
- holistic

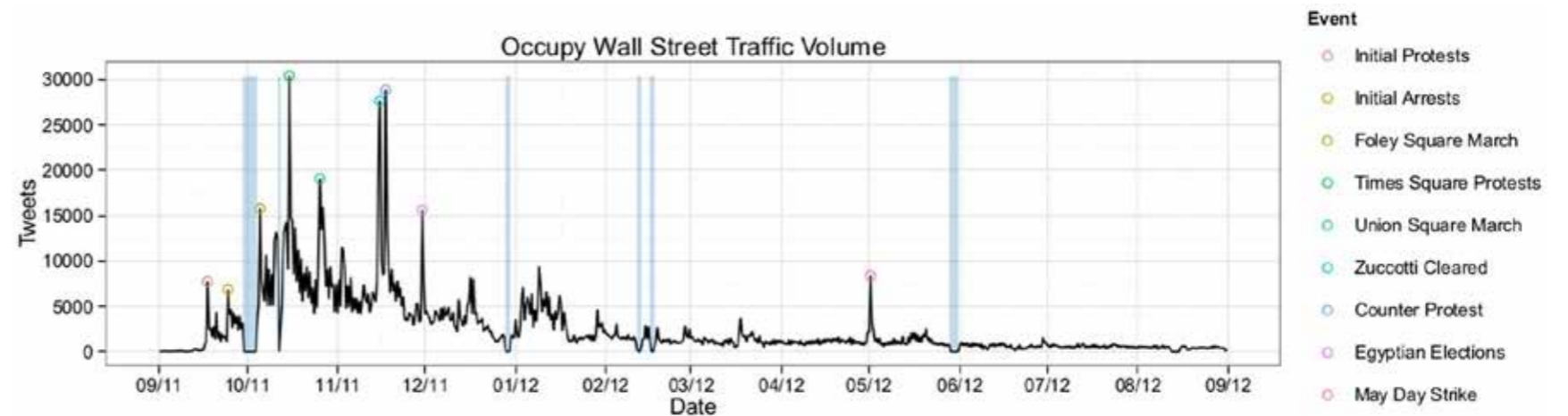


Figure 1. Total number of tweets related to Occupy Wall Street between September 2011 and September 2012. Each timestep represents a 12-hour period, with vertical blue bars overlaid on periods during which access to the Twitter streaming API was interrupted. Large bursts in activity tend to correspond to protest or police action on the ground, demarcated with circles. From left to right, the events are: initial Occupy Wall Street protest in Zuccotti Park; initial NYPD arrests of protesters; march from Foley Square to Zuccotti Park; protest at U.S. Armed Forces recruiting station in Times Square; protest in support of Iraq veteran injured by police-fired projectile; NYPD action to clear Zuccotti Park; protest against eviction from Zuccotti Park; first round of Egyptian elections; 'May Day' general strike and planned reoccupation of former encampments.

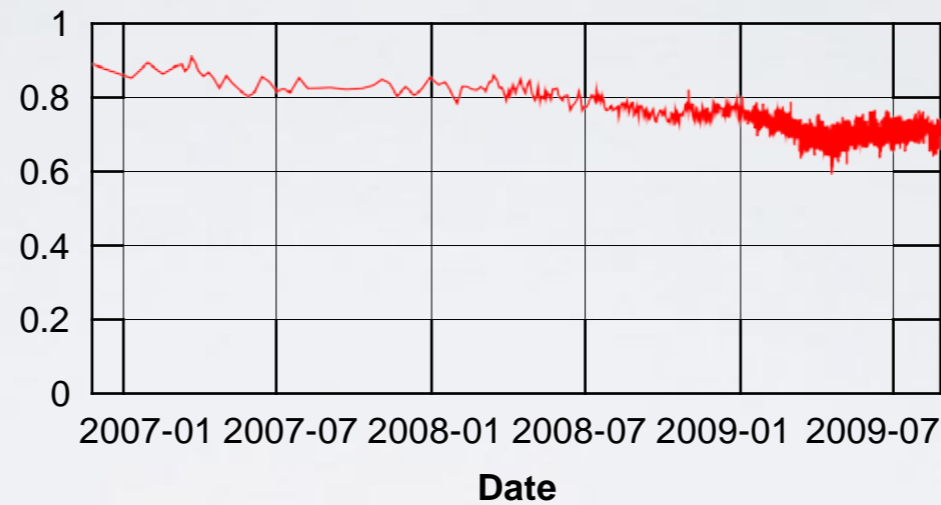
COLLECTION PROTOCOLS

- *sampling issues*

(Mislove, Lehman, Ahn, Onnela, Rosenquist, 2012)

"Understanding the Demographics of Twitter Users"

Fraction of Joining Users
who are Male

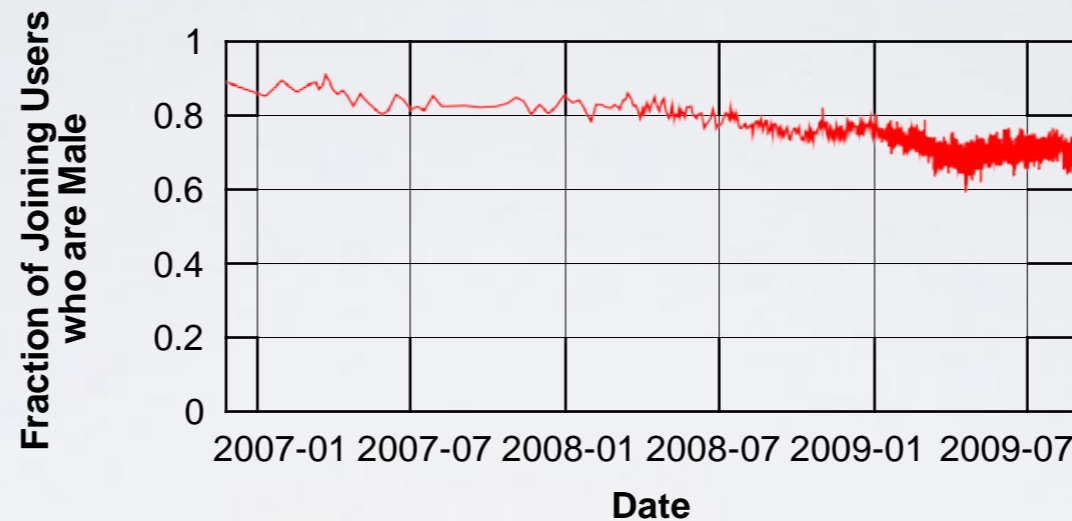


COLLECTION PROTOCOLS

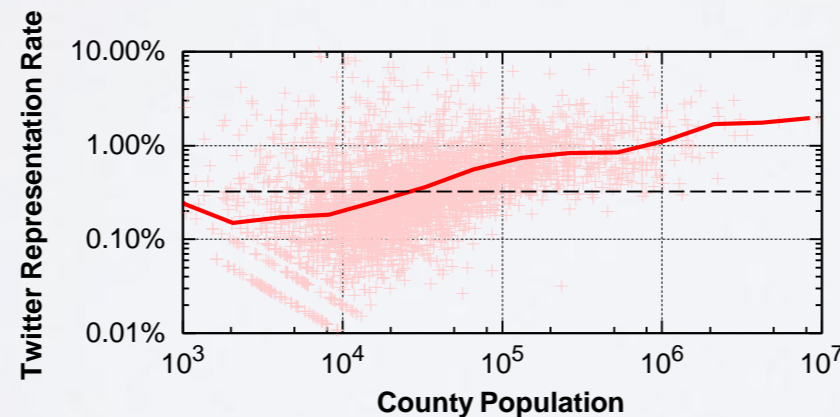
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"Understanding the Demographics of Twitter Users"



75.3% of the publicly visible users listed a location



Twitter representation rate: #Twitter users in that county divided by the number of people in that county in the 2000 U.S.

Figure 1: Scatterplot of US county population versus Twitter representation rate in that county. The dark line represents the aggregated median, and the dashed black line represents the overall median (0.324%). There is a clear overrepresentation of more populous counties.

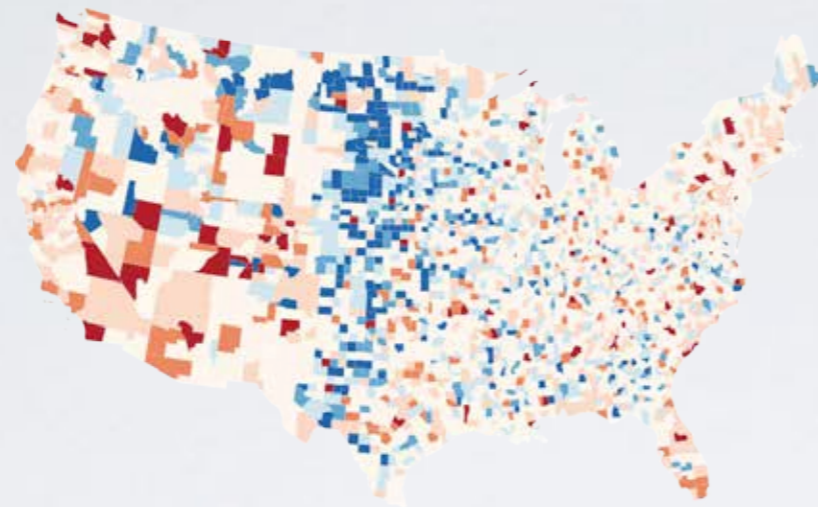


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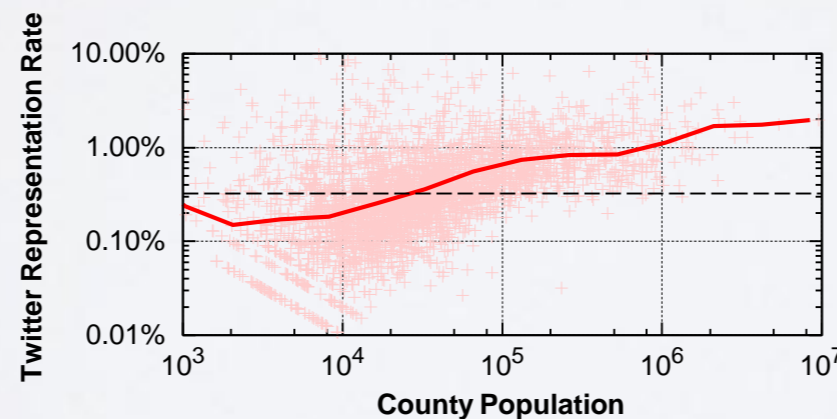
(a) Normal representation



(b) Area cartogram representation

Figure 2: Per-county over- and underrepresentation of U.S. population in Twitter, relative to the median per-county representation rate of 0.324%, presented in both (a) a normal layout and (b) an area cartogram based on the 2000 Census population. Blue colors indicate underrepresentation, while red colors represent overrepresentation. The intensity of the color corresponds to the log of the over- or underrepresentation rate. Clear trends are visible, such as the underrepresentation of mid-west and overrepresentation of populous counties.

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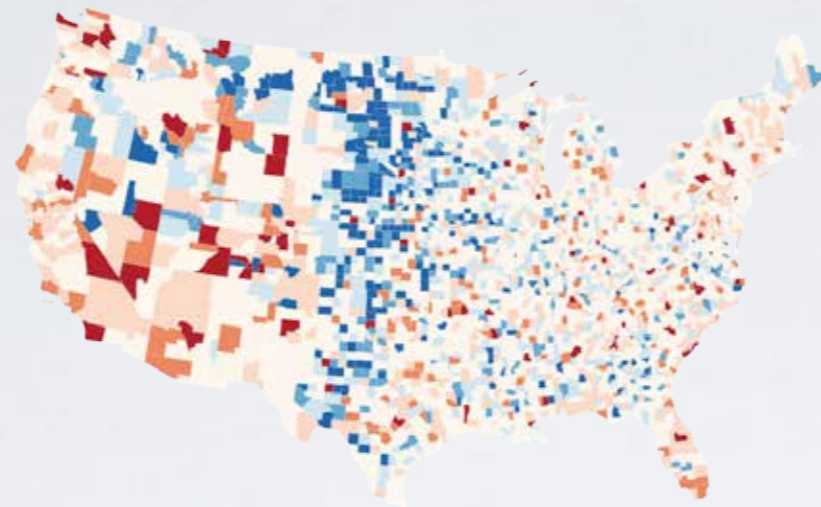


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(a) Caucasian (non-hispanic)



(b) African-American



(c) Asian or Pacific Islander



(d) Hispanic

Figure 4: Per-county area cartograms of Twitter over- and undersampling rates of Caucasian, African-American, Asian, and Hispanic users, relative to the 2000 U.S. Census. Only counties with more than 500 Twitter users with inferred race/ethnicity are shown. Blue regions correspond to undersampling; red regions to oversampling.

TYPICAL QUESTIONS

- **Shape of online interactions**
 - *is it much different ?*
 - Existence of hierarchies, of clustering, communities, aggregates, central people, etc.
 - Existence of specific roles (e.g. answer person in case of discussion forums)
 - In some cases, expected to be correlated to offline social networks (e.g. Facebook)

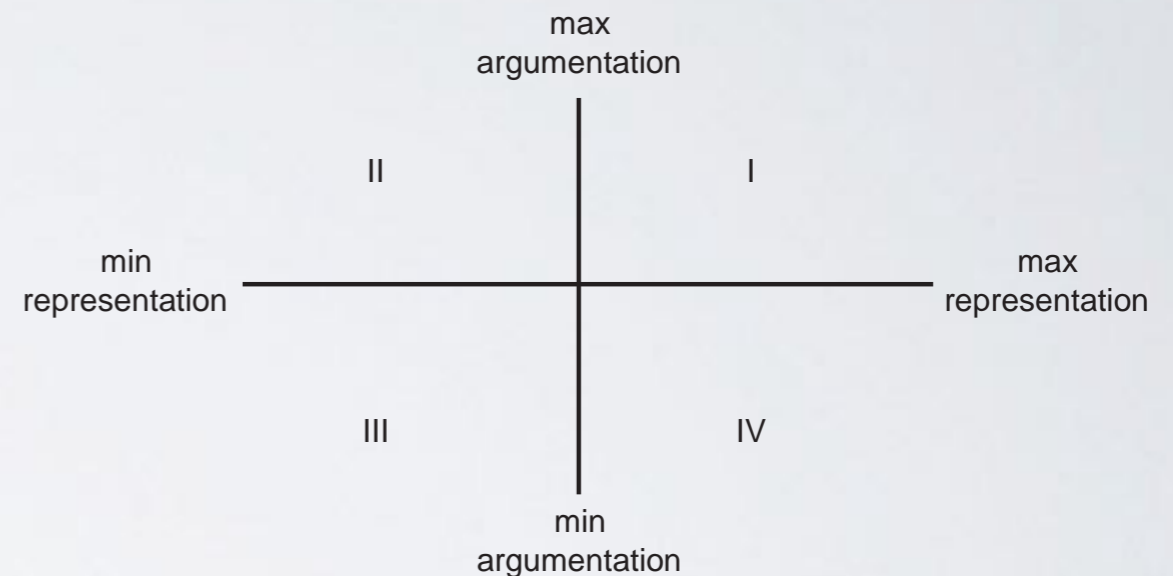
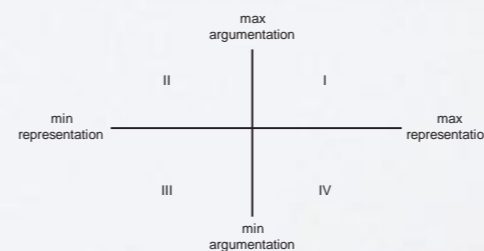
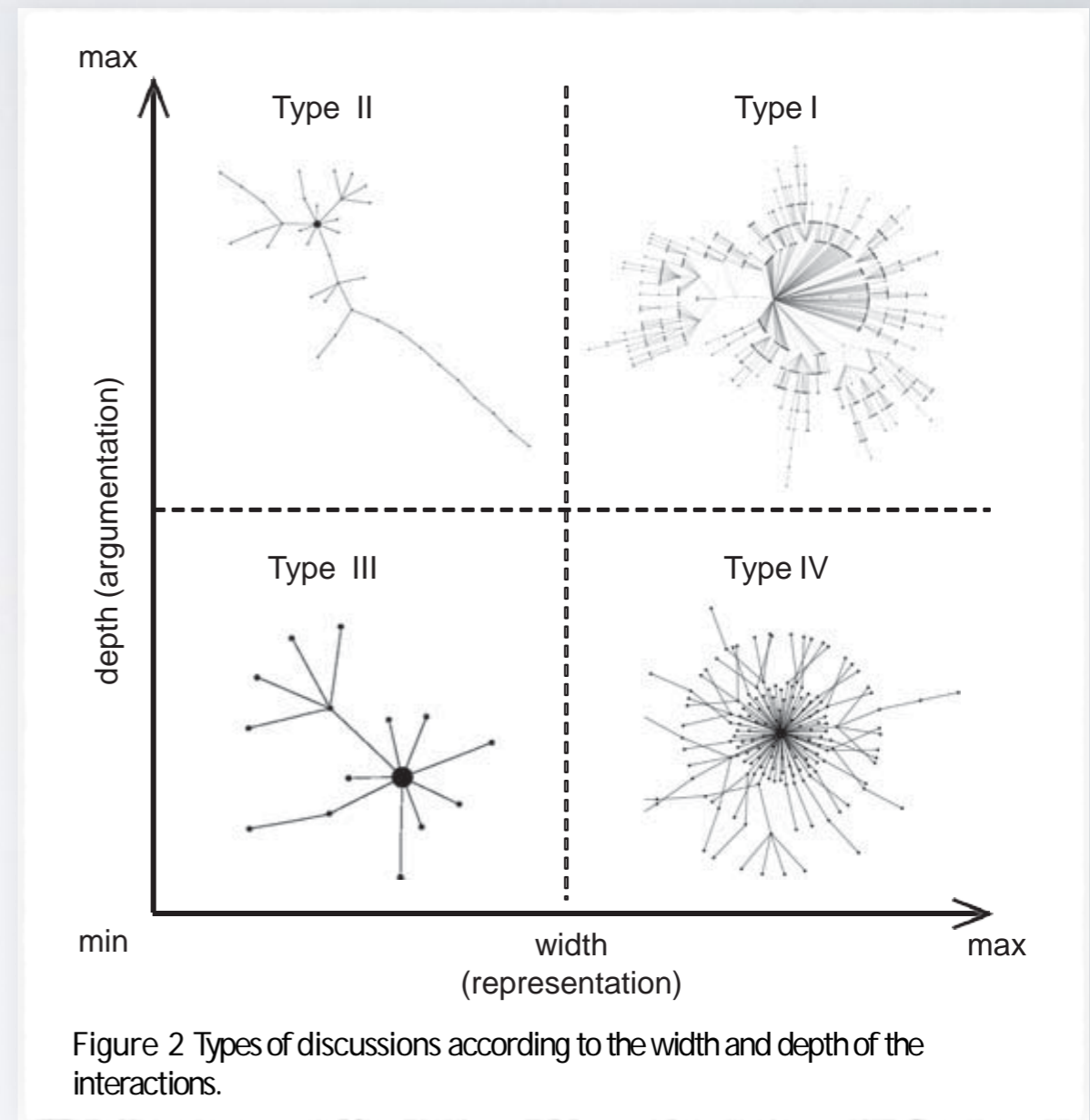


Figure 1 Prerequisites of deliberation.
Source: Adapted from Ackerman and Fishkin (2002).

The structure of political discussion networks: a model for the analysis of online deliberation

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The structure of political discussion networks: a model for the analysis of online deliberation

Sandra Gonzalez-Bailon¹, Andreas Kaltenbrunner², Rafael E Banchs²
Journal of Information Technology (2010), 1–14

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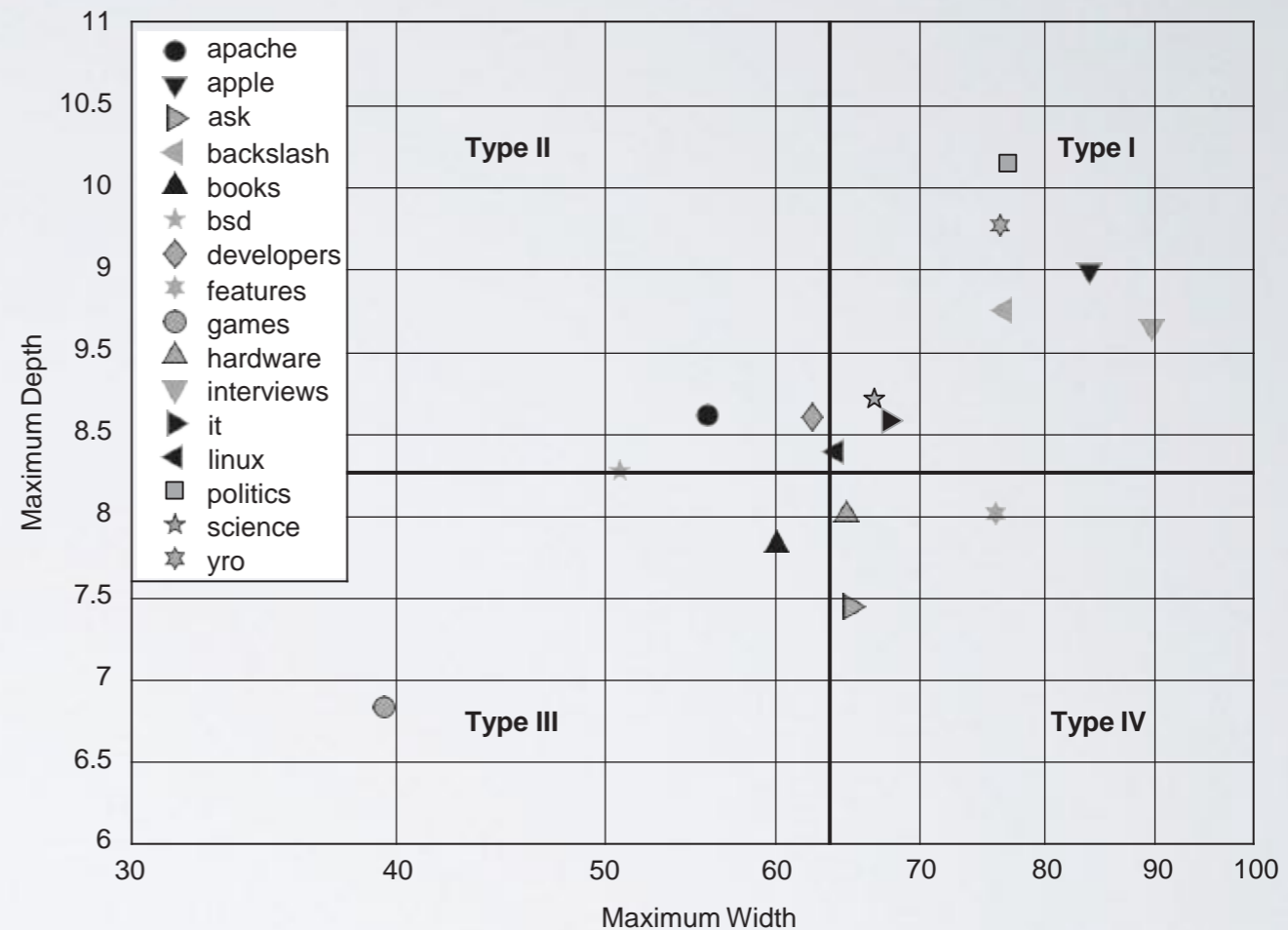


Figure 4 Width-depth distributions of computed centroids for all post categories.

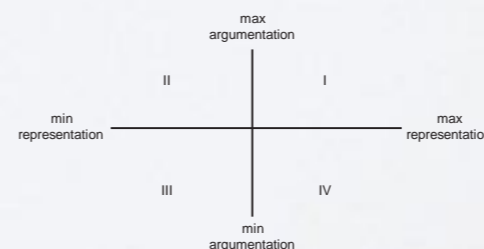


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spotlight europe

2014 /02 — Mai 2014

Im Netz der Populisten

73 Prozent der Bevölkerung der Europäischen Union nutzten 2013 das Internet. Tendenz steigend. Kurz vor der Europawahl wollten wir daher wissen: Wie präsent und aktiv sind die antieuropäischen Populisten im Internet? Resultat: Die Anti-Europäer sind isoliert und zersplittert. Es gibt aber eine lebendige pro-europäische Netzöffentlichkeit. Nur zivilgesellschaftliche Initiativen brauchen noch mehr Unterstützung.

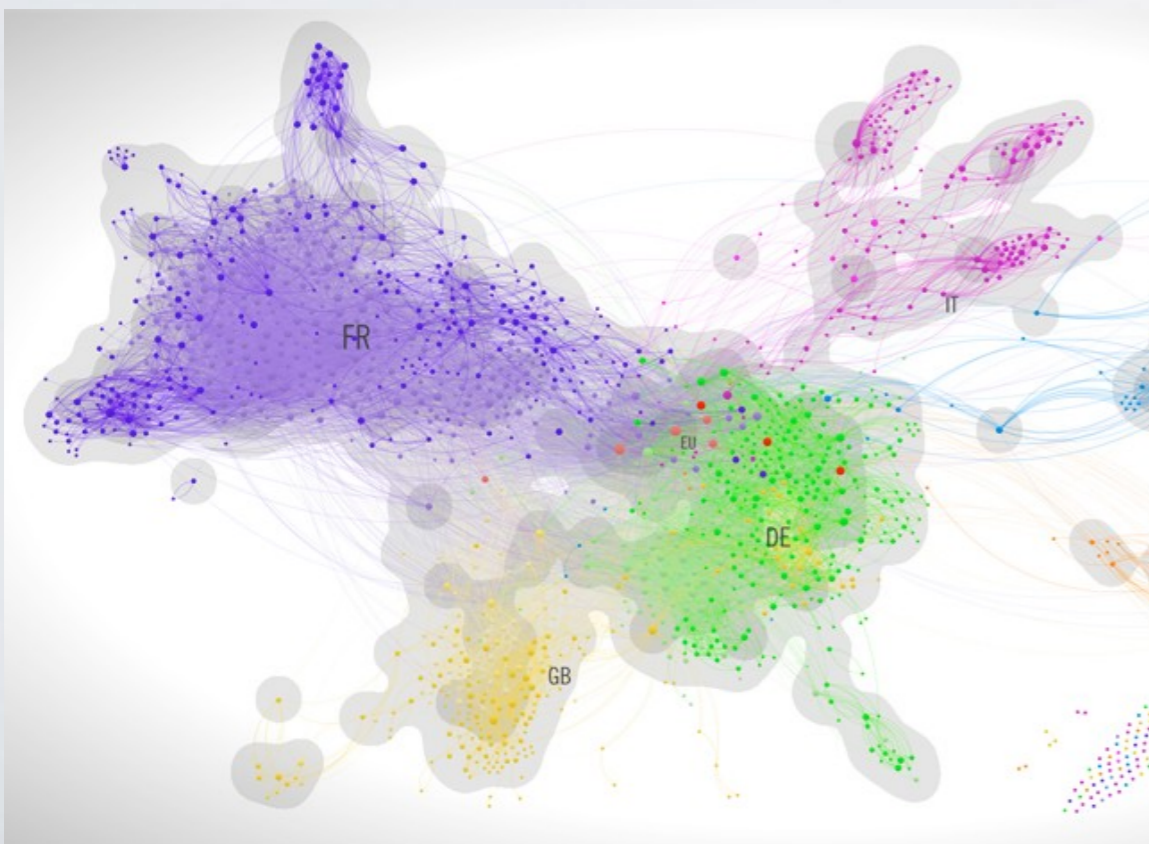
988 Internetseiten mit antieuropäischen Inhalten

In Deutschland, Frankreich, Großbritannien, Italien, den Niederlanden und Polen



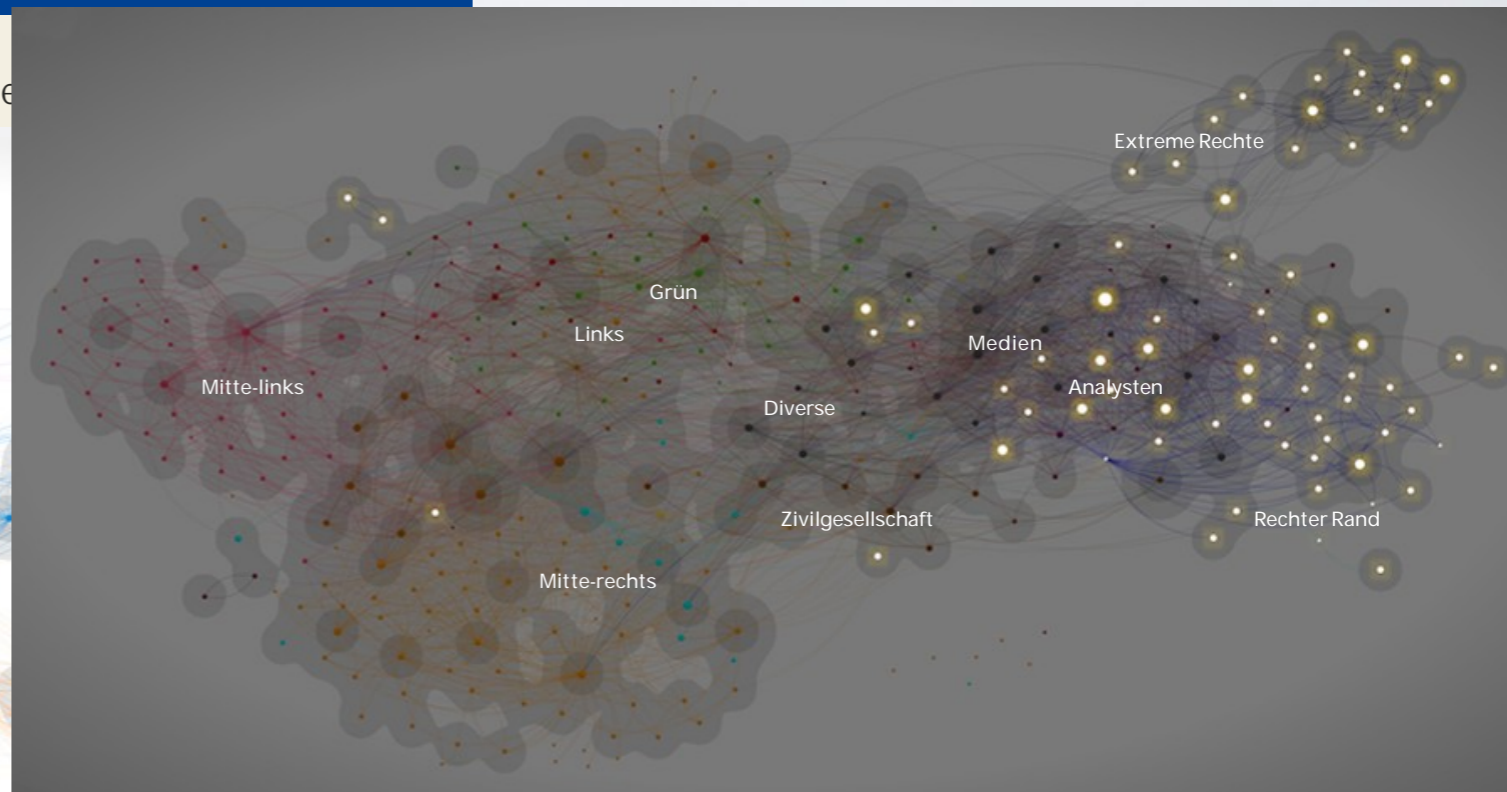
1.638 europapolitische Internetseiten

In Deutschland und Frankreich mit pro- und antieuropäischen Inhalten; in Großbritannien, den Niederlanden, Italien und Polen mit antieuropäischen Inhalten



Deutschland

73 Internetseiten mit antieuropäischen Inhalten



Quelle: linkfluence

© Bertelsmann Stiftung

spotlight europe

2014 /02 — Mai 2014

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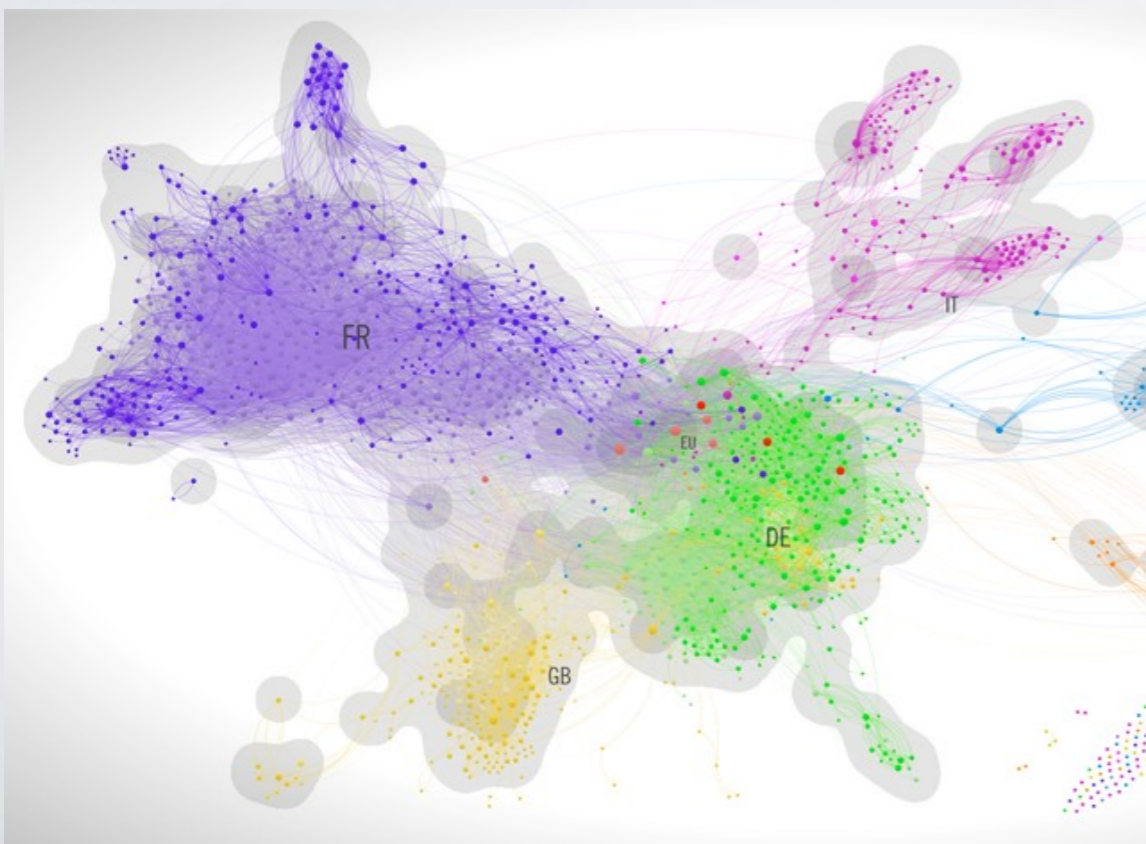
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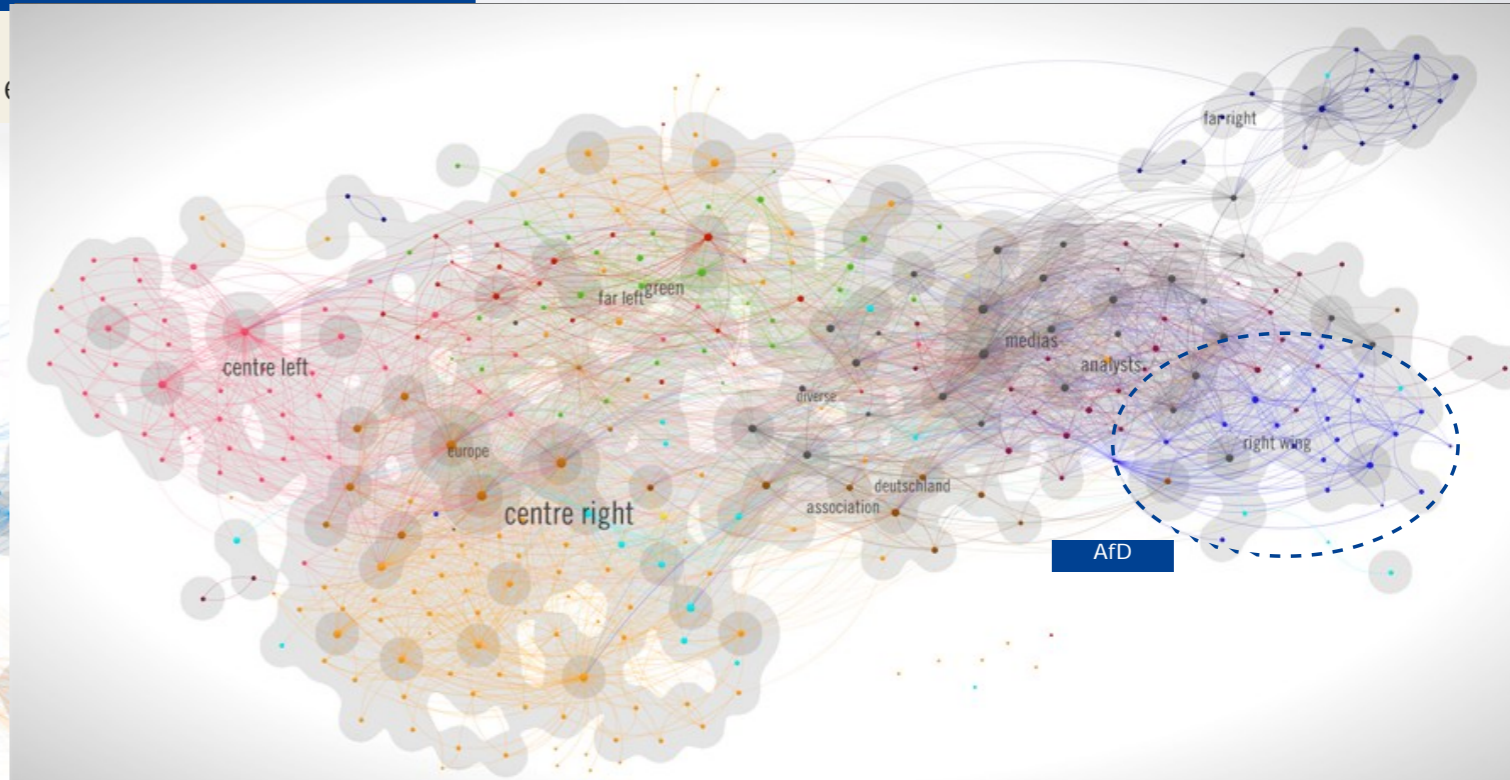
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Deutschland

349 Internetseiten mit pro- und antieuropäischen Inhalten



Quelle: linkfluence

© Bertelsmann Stiftung

Political Polarization on Twitter

M. D. Conover, J. Ratkiewicz, M. Francisco, B. Gonçalves, A. Flammini, F. Menczer

Center for Complex Networks and Systems Research
School of Informatics and Computing
Indiana University, Bloomington, IN, USA

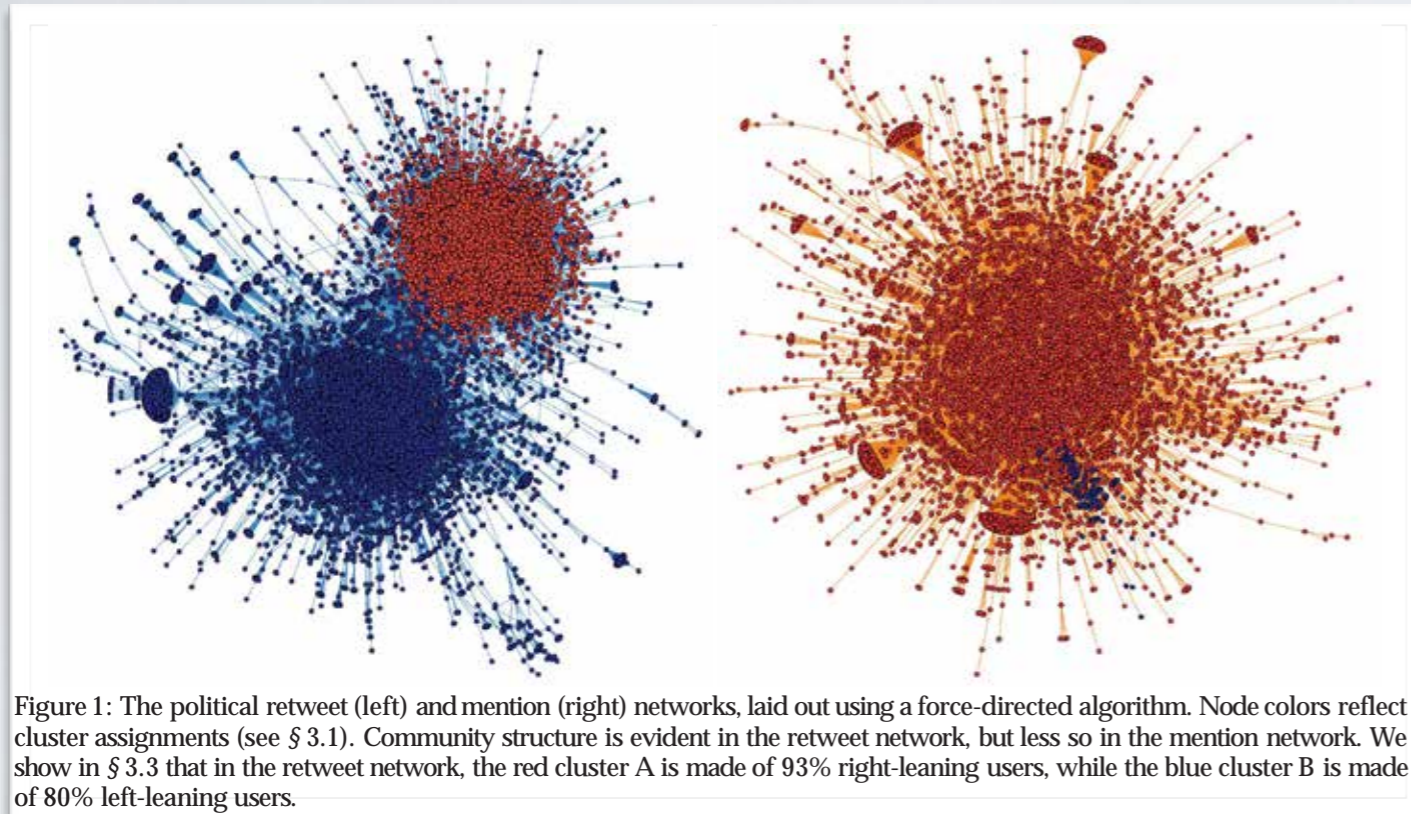


Figure 1: The political retweet (left) and mention (right) networks, laid out using a force-directed algorithm. Node colors reflect cluster assignments (see § 3.1). Community structure is evident in the retweet network, but less so in the mention network. We show in § 3.3 that in the retweet network, the red cluster A is made of 93% right-leaning users, while the blue cluster B is made of 80% left-leaning users.

“We demonstrate that the network of political retweets exhibits a highly segregated partisan structure, with extremely limited connectivity between left- and right-leaning users.”

“Surprisingly this is not the case for the user-to-user mention network, which is dominated by a single politically heterogeneous cluster of users in which ideologically-opposed individuals interact at a much higher rate compared to the network of retweets.”

“To explain the distinct topologies of the retweet and mention networks we conjecture that politically motivated individuals provoke interaction by injecting partisan content into information streams whose primary audience consists of ideologically-opposed users”

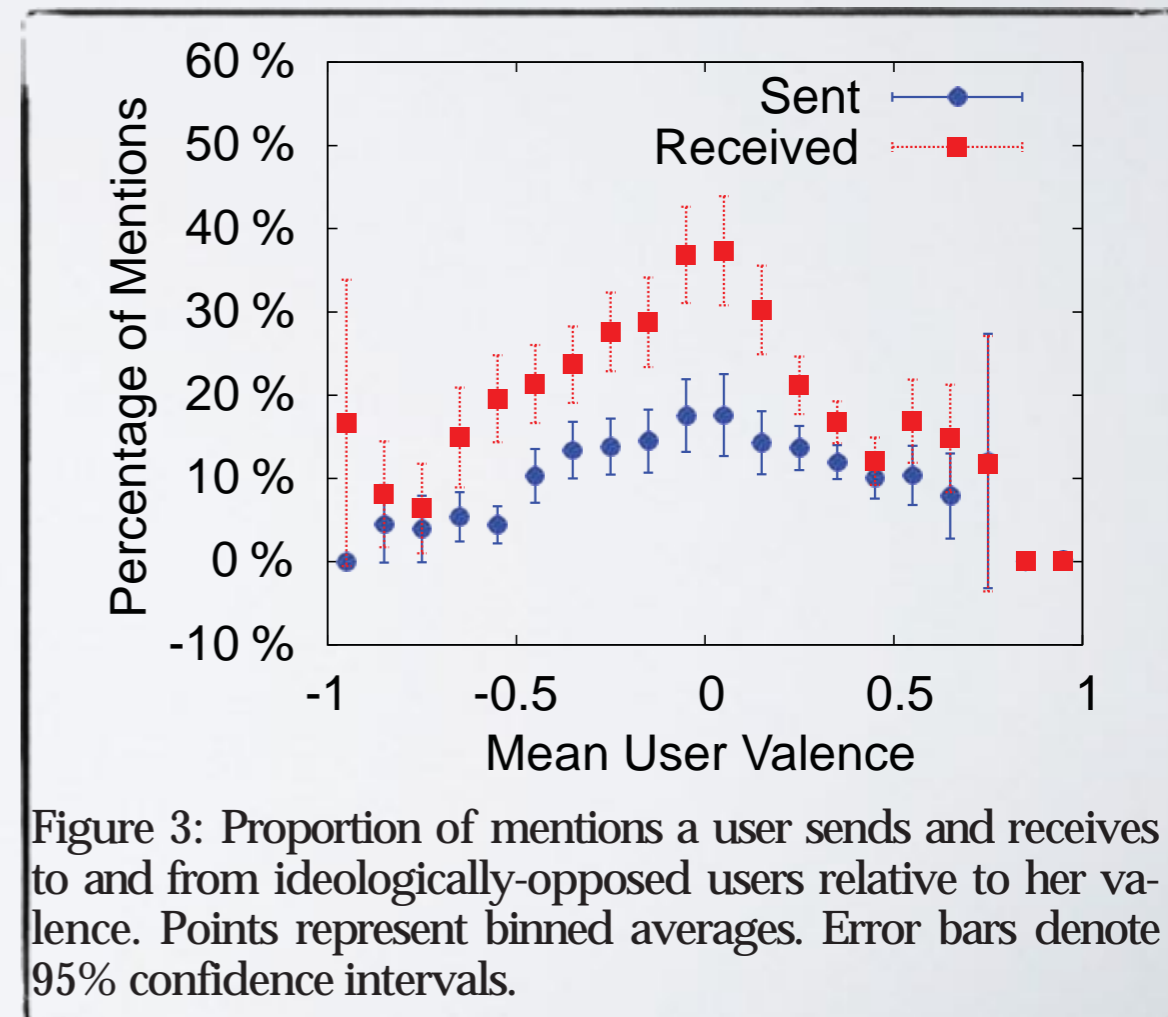


Figure 3: Proportion of mentions a user sends and receives to and from ideologically-opposed users relative to her valence. Points represent binned averages. Error bars denote 95% confidence intervals.

Diffusion observation

on Twitter with hashtags...

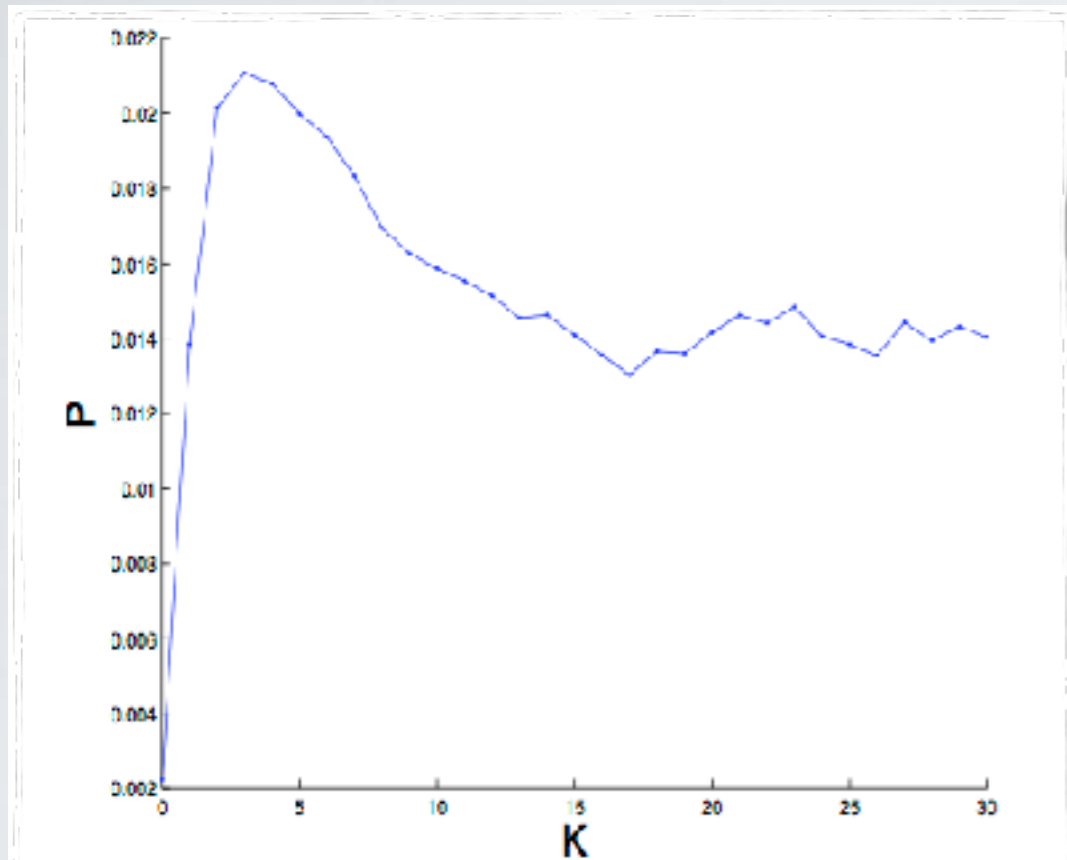
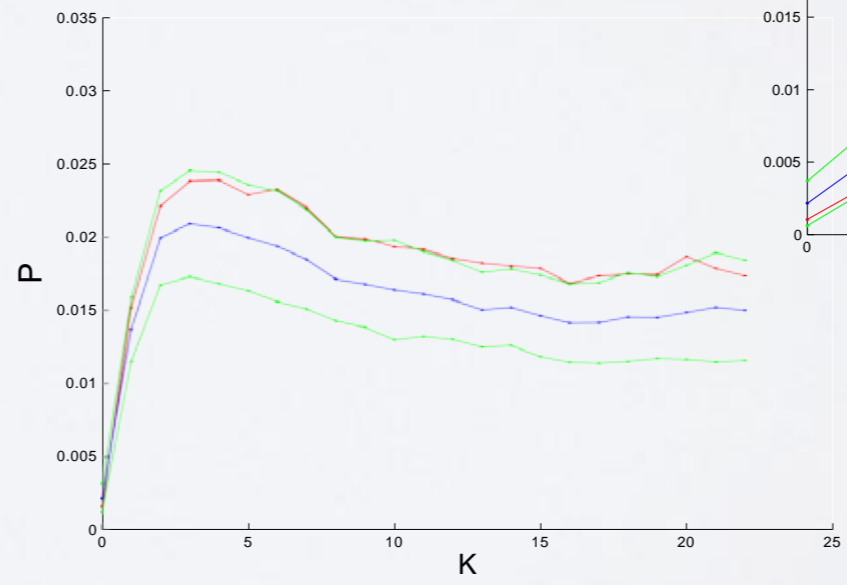
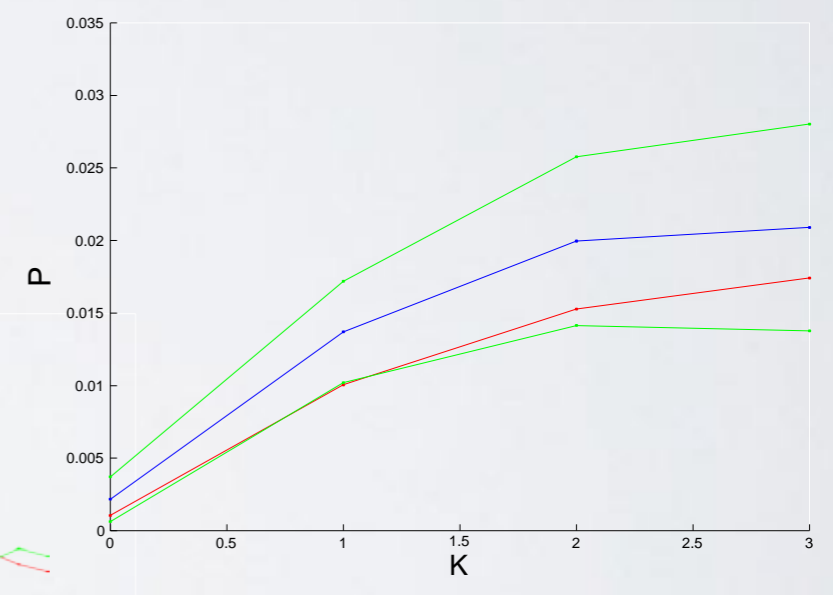


Figure 1: Average exposure curve for the top 500 hashtags. $P(K)$ is the fraction of users who adopt the hashtag directly after their k^{th} exposure to it, given that they had not yet adopted it

Differences in the Mechanics of Information Diffusion Across Topics: Idioms, Political Hashtags, and Complex Contagion on Twitter
WWW 2011, March 28–April 1, 2011, Hyderabad, India.
Daniel M. Romero Brendan Meeder Jon Kleinberg



(f) Political



(h) Games

Diffusion observation

...with respect to community structure

- effect of **clustered communities**?
- contradictory influence of:
 - homophily (communities reinforcing contagion through multiple exposures)
 - clustering (slowing random information flows).

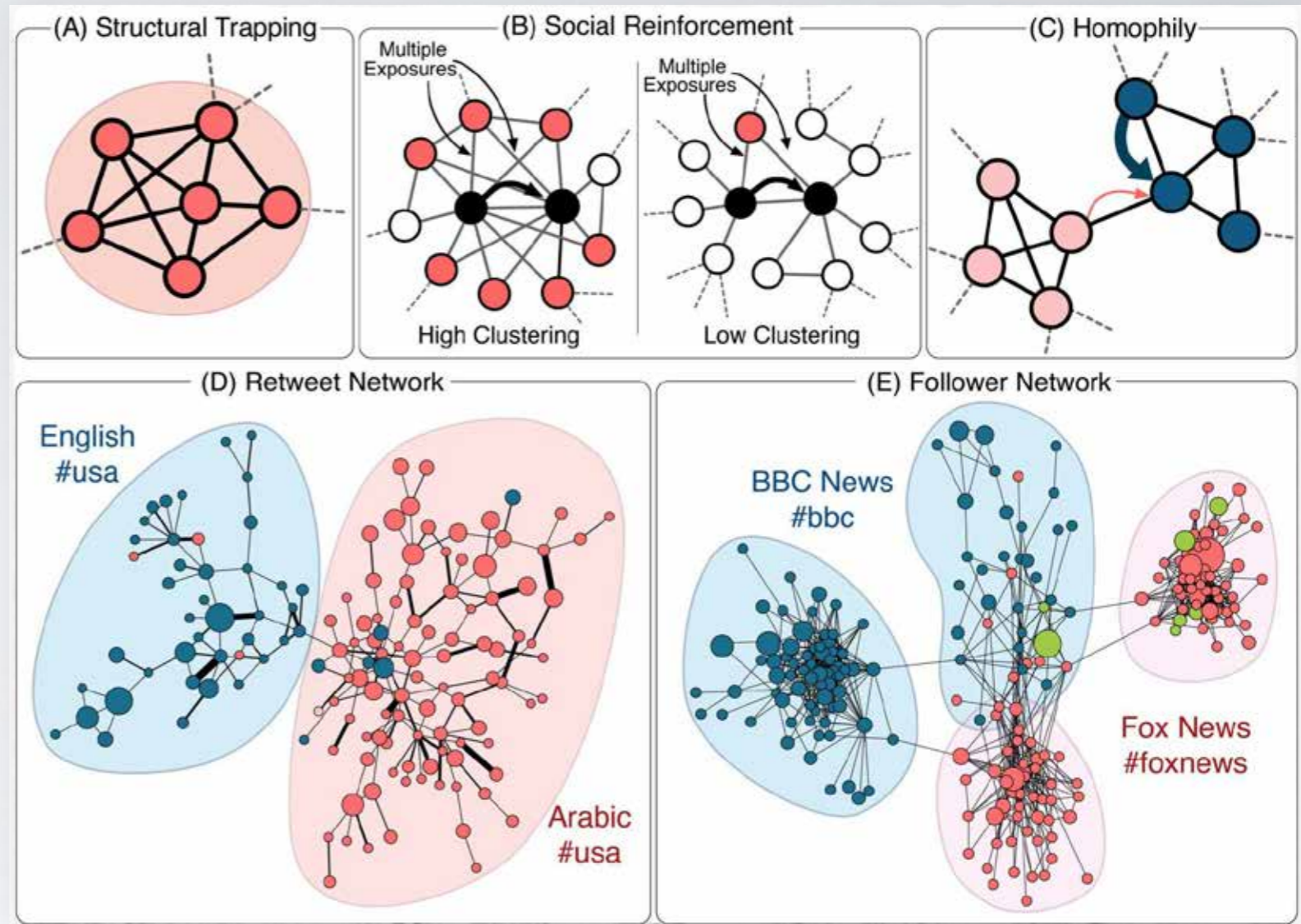


Table 1 | Baseline models for information diffusion

	Community effects			Simulation implementation
	Network	Reinforcement	Homophily	
M_1				For a given hashtag h , M_1 randomly samples the same number of tweets or users as in the real data.
M_2	3			M_2 takes the network structure into account while neglecting social reinforcement and homophily. M_2 starts with a random seed user. At each step, with probability p , an infected node is randomly selected and one of its neighbors adopts the meme, or with probability $1 - p$, the process restarts from a new seed user ($p \in [0, 0.85]$).
M_3	3	3		The cascade in M_3 is generated similarly to M_2 but at each step the user with the maximum number of infected neighbors adopts the meme.
M_4	3		3	In M_4 , the simple cascading process is simulated in the same way as in M_2 but subject to the constraint that at each step, only neighbors in the same community have a chance to adopt the meme.

- **"viral"** (irrespective of community structure, disease-like spreading: clustering slows diffusion)
- vs. **"non-viral"** (community structure-dependent, clustering facilitates diffusion)

Diffusion observation

(Weng, Menczer, Ahn, 2013)

...with respect to community structure

- effect of **clustered communities**?
- contradictory influence of:
 - homophily (communities reinforcing contagion through multiple exposures)
 - clustering (slowing random information flows).

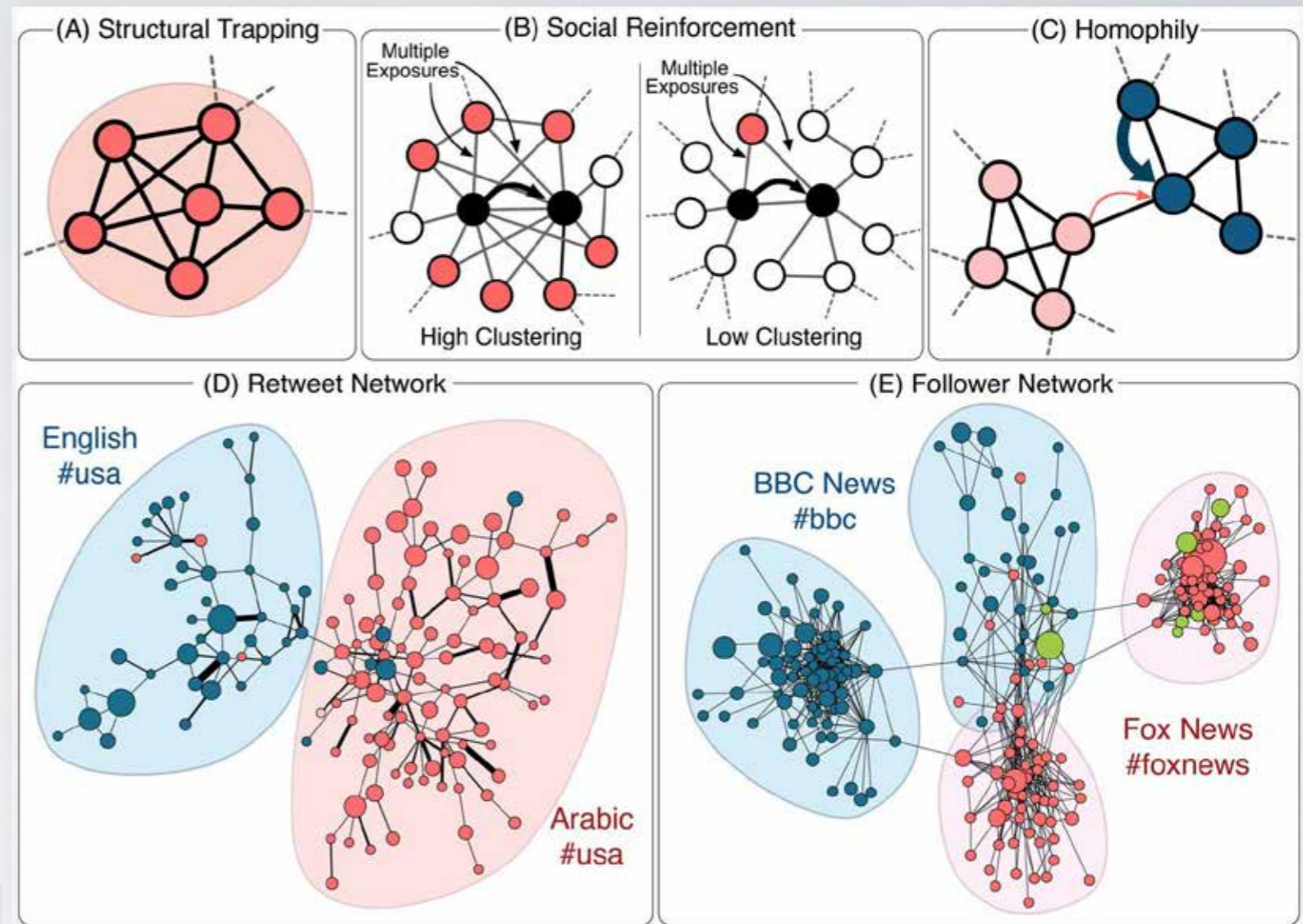


Table 1 | Baseline models for information diffusion

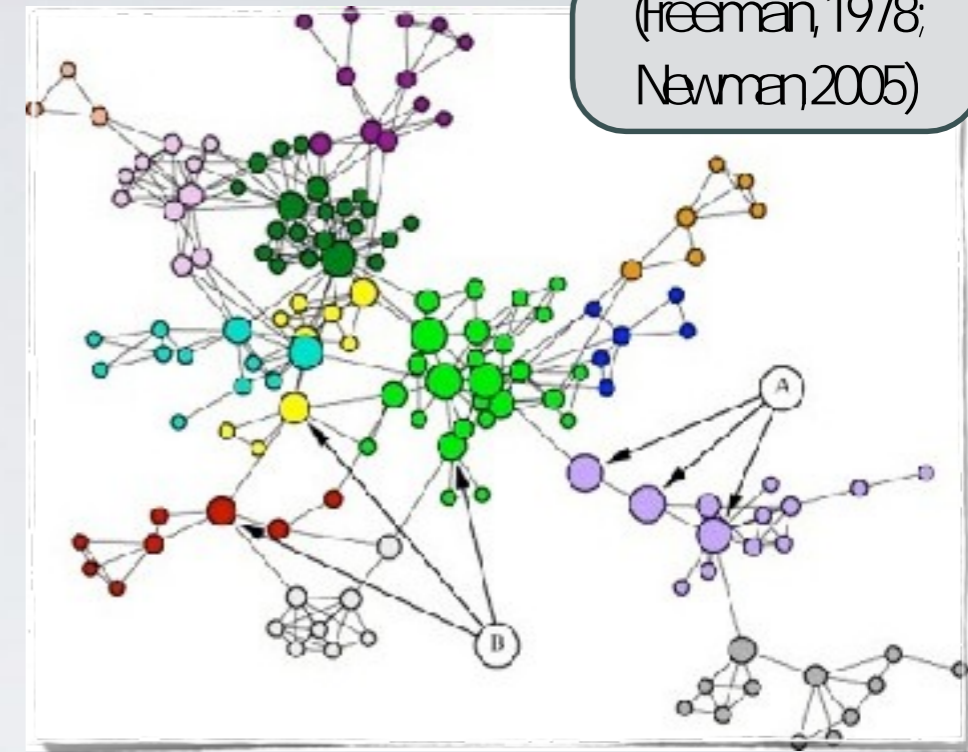
	Community effects			Simulation implementation
	Network	Reinforcement	Homophily	
M_1				For a given hashtag h , M_1 randomly samples the same number of tweets or users as in the real data.
M_2	3			M_2 takes the network structure into account while neglecting social reinforcement and homophily. M_2 starts with a random seed user. At each step, with probability p , an infected node is randomly selected and one of its neighbors adopts the meme, or with probability $1 - p$, the process restarts from a new seed user ($p \in [0, 0.85]$).
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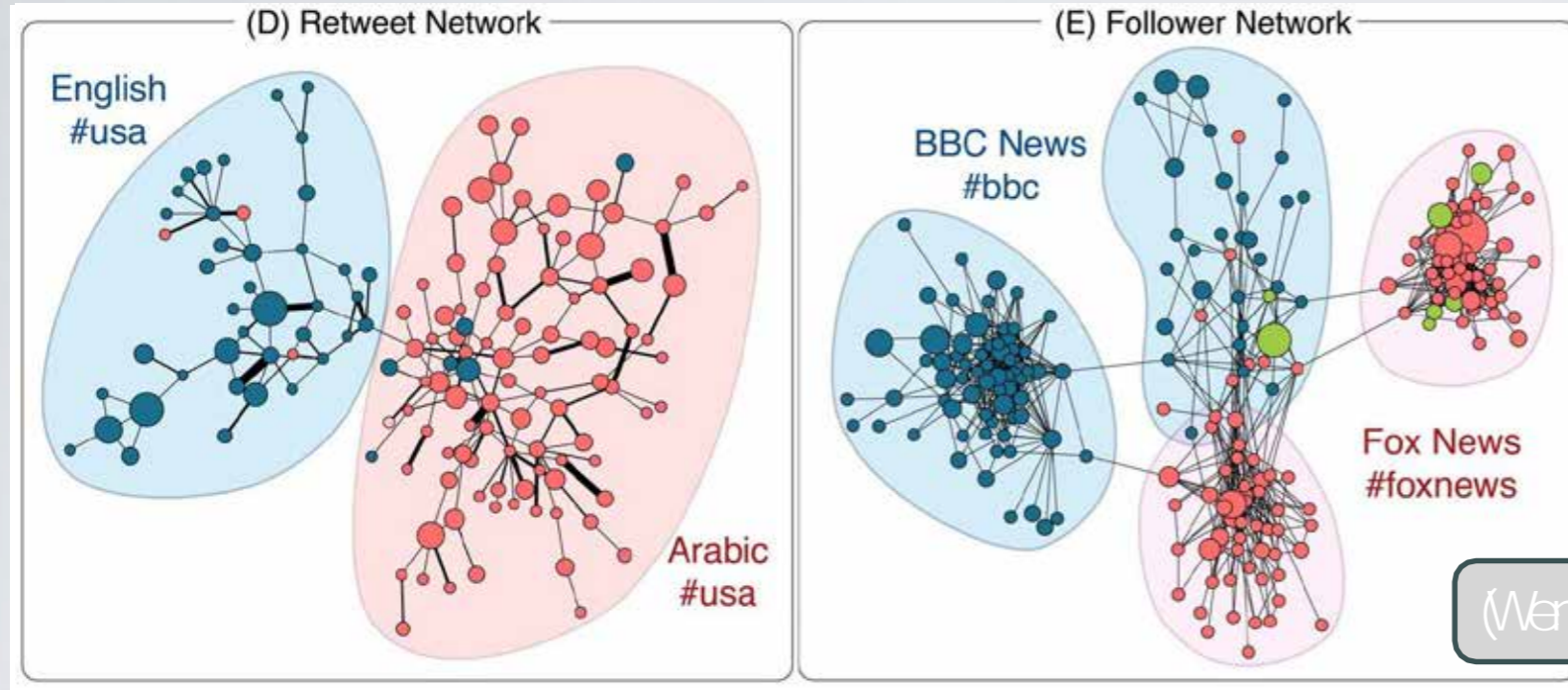
FRAGMENTATION

- Socio-Semantic Structure
- Algorithms

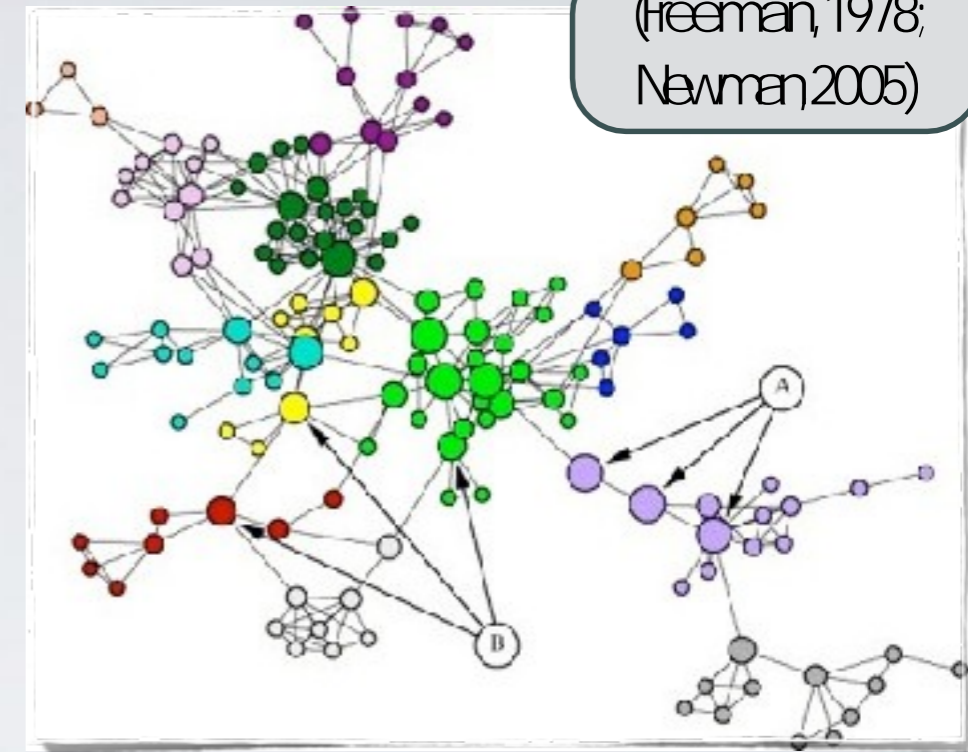
- **Aggregates**, be they structural or semantic, are **ubiquitous**



- **Aggregates**, be they structural or semantic, are **ubiquitous**

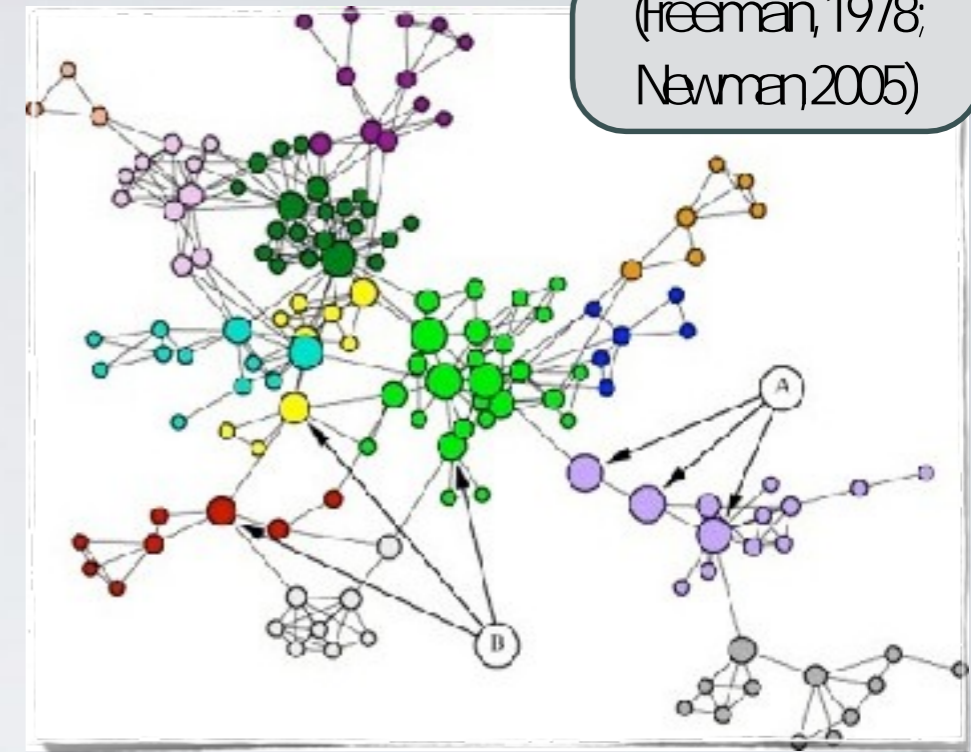
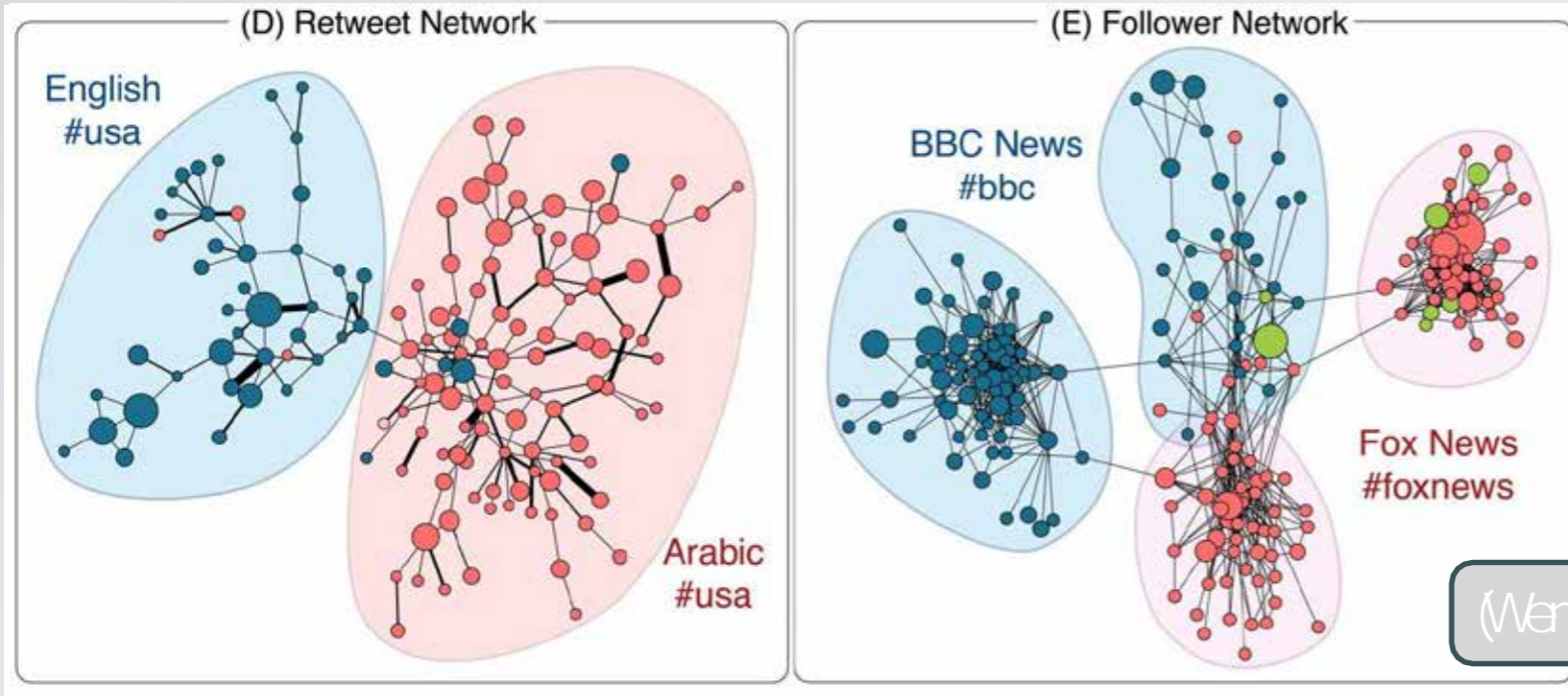


(Weng, Menczer, Ahn, 2013)



- **Aggregates, be they structural or semantic, are ubiquitous**

(Freeman, 1978;
Newman, 2005)



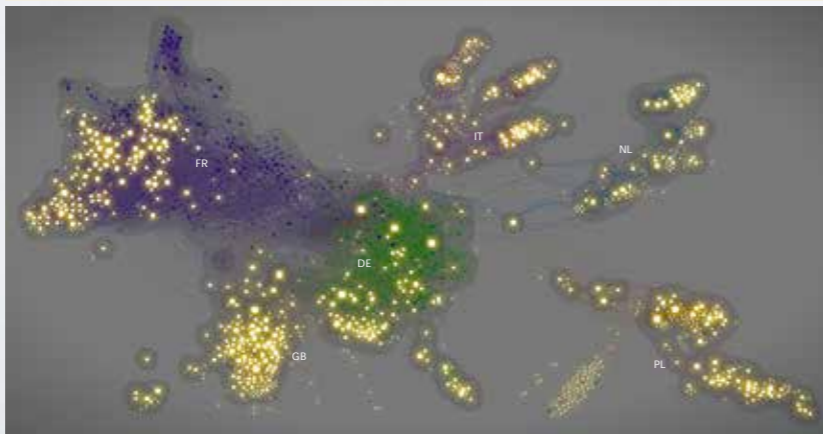
(Weng, Menczer, Ahn, 2013)

spotlight europe | Bertelsmann Stiftung
2014/02 — Mai 2014
Im Netz der Populisten

Wie präsent und aktiv sind die antieuropäischen Populisten im Internet? Resultat: Die Anti-Europäer sind isoliert und zersplittert. Es gibt aber eine lebendige pro-europäische Netzöffentlichkeit. Nur zivilgesellschaftliche Initiativen brauchen noch mehr Unterstützung.

988 Internetseiten mit antieuropäischen Inhalten

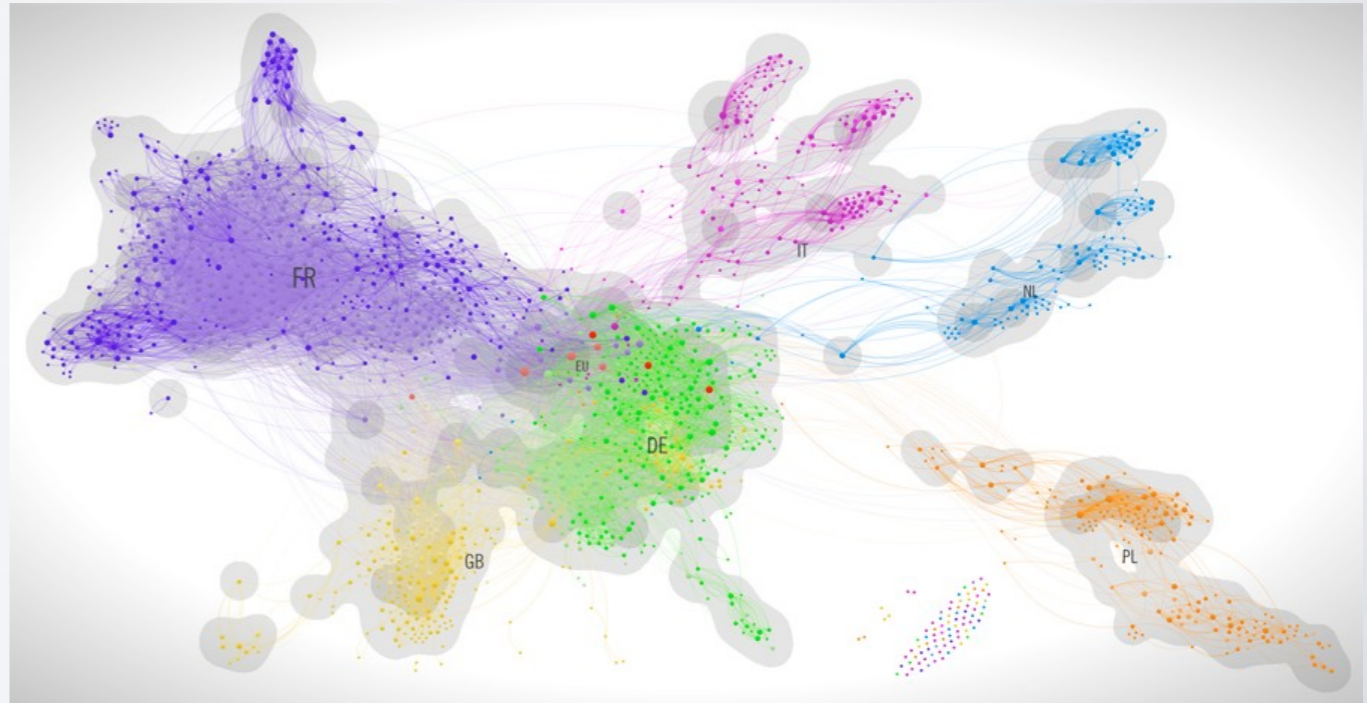
In Deutschland, Frankreich, Großbritannien, Italien, den Niederlanden und Polen



Quelle: linkfluence © Bertelsmann Stiftung

1.638 europapolitische Internetseiten

In Deutschland und Frankreich mit pro- und antieuropäischen Inhalten; in Großbritannien, den Niederlanden, Italien und Polen mit antieuropäischen Inhalten



Quelle: linkfluence © Bertelsmann Stiftung

CONNECTING INTERACTIONS AND CONTENT

Studying the aNobii book rating/tagging social network

semantic-structural proximity (bookshelf)

(Aielo, Barrat, Cattuto, Ruffo, Schifanella, 2010)

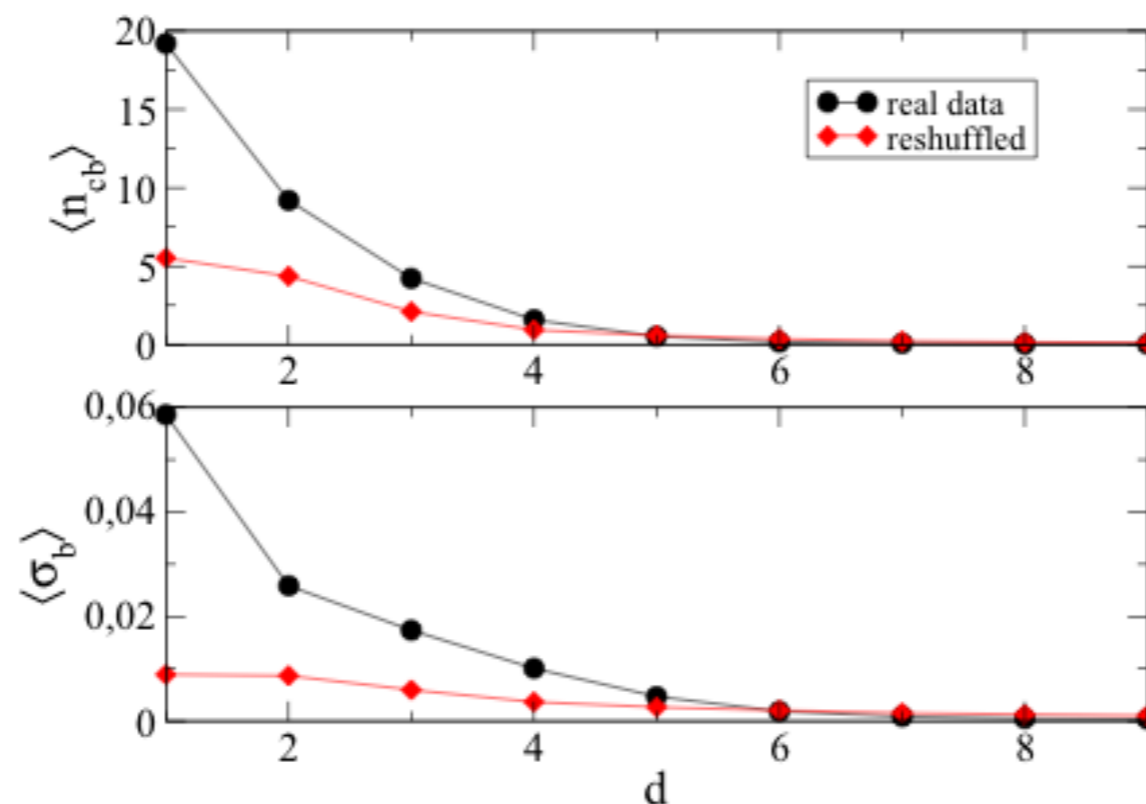


Fig. 3. Average similarity of the libraries of aNobii users as a function of their distance in the social network. The similarity is measured by the average number of common books (top, $\langle n_{cb} \rangle$), and by the average cosine similarity (bottom, $\langle \sigma_b \rangle$) between the book lists. In both cases data for the same social network with reshuffled booklists are shown.

CONNECTING INTERACTIONS AND CONTENT

Studying the aNobii book rating/tagging social network

— semantic-structural proximity (bookshelf)

— spatial-structural homophily (location)

(Aiello, Barrat, Cattuto, Ruffo, Schifanella, 2010)

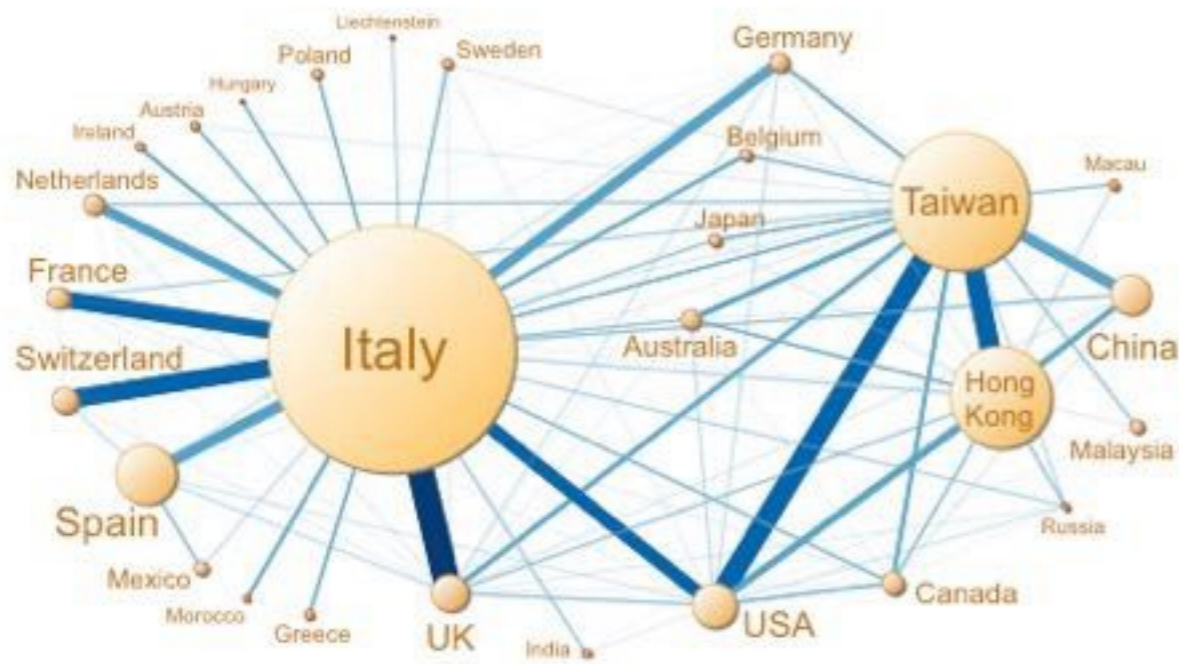


Fig. 5. Graph of aNobii countries. Nodes areas are scaled according to the size of the geographic communities and edges' width and colors are proportioned to the number of links that connects nodes between the countries.

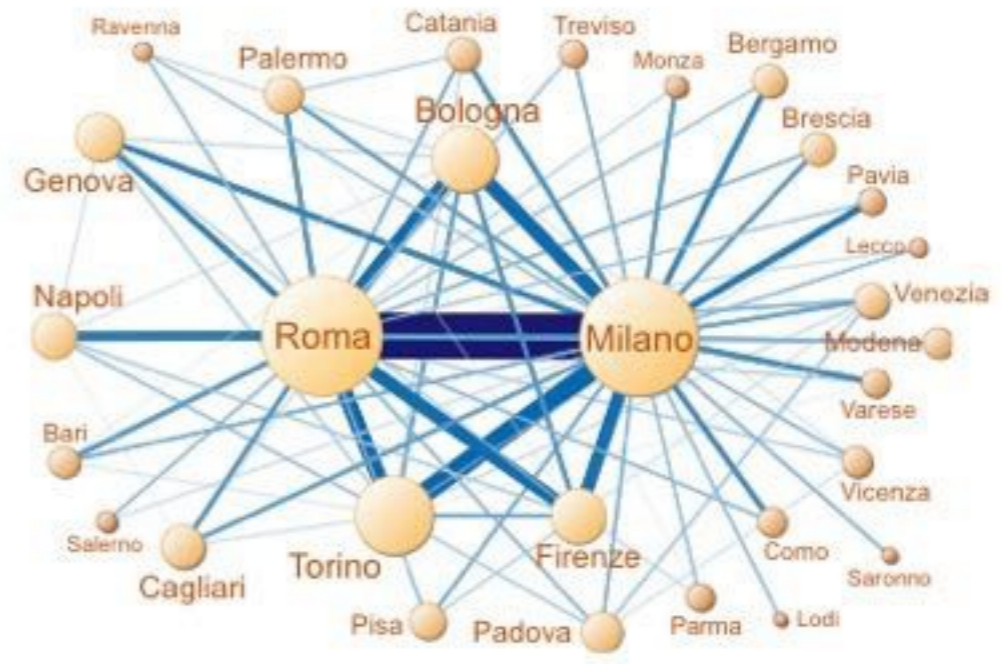


Fig. 6. Graph of aNobii Italian towns. Nodes areas and edges' width and colors are scaled like in Fig. 5. Small towns linked to others with less than 10 links are not represented.

CONNECTING INTERACTIONS AND CONTENT

Studying the aNobii book rating/tagging social network

semantic-structural proximity (bookshelf)

spatial-structural homophily (location)

although not always, see Lin et al.

CONNECTIONS 27(2): 15-23

The Blog Network in America: Blogs as Indicators of Relationships among US Cities

Jia Lin¹

Department of Communication, State University of New York at Buffalo

Alexander Halavais²

Department of Communication, State University of New York at Buffalo

Bin Zhang³

School of Medicine, University of California Los Angeles



Figure 1. Distribution of bloggers in America. Circle radius is proportional to the number of webloggers in a region.

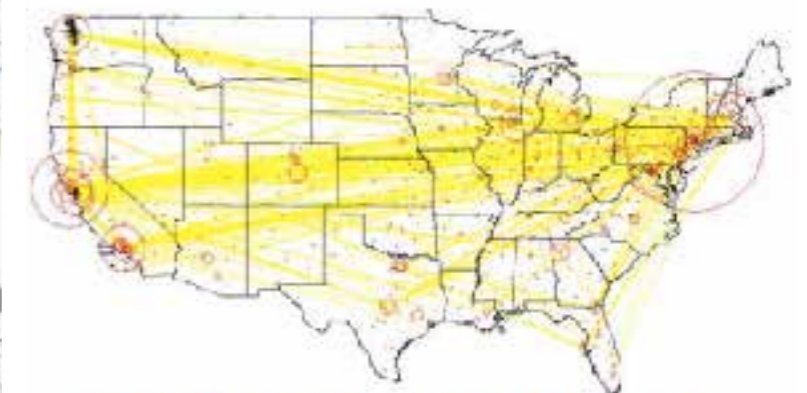


Figure 2. Blog network plot on American map. Circle radius is proportional to the number of inbound links to a region.

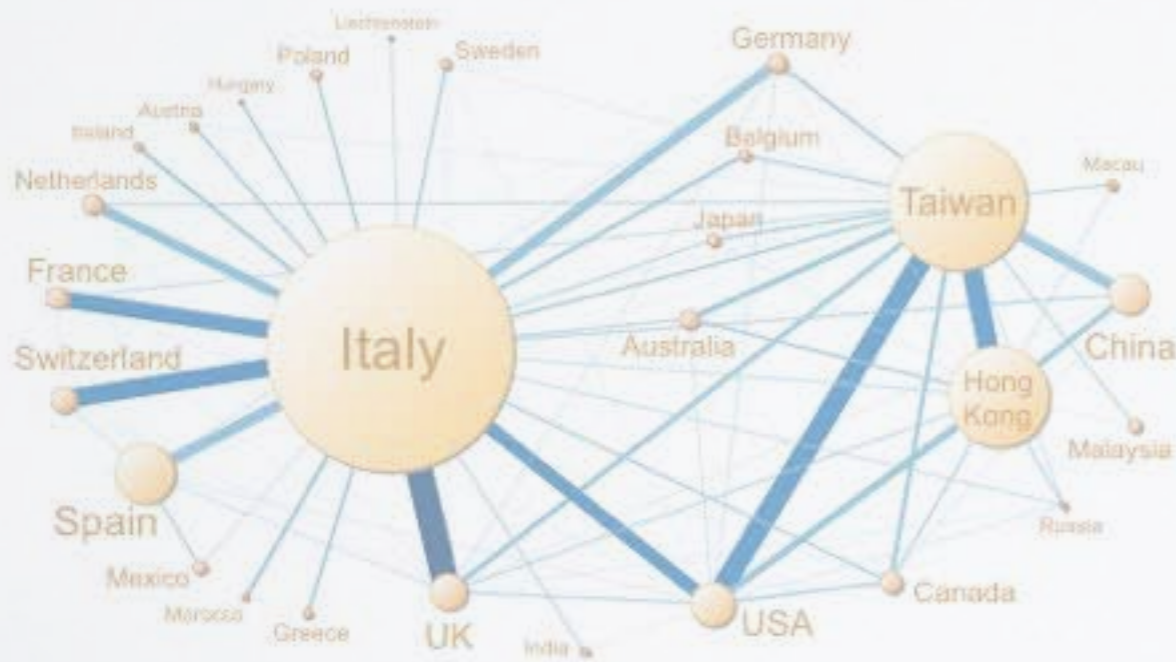


Fig. 5. Graph of aNobii countries. Nodes areas are scaled according to the size of the geographic communities and edges' width and colors are proportioned to the number of links that connects nodes between the countries.



Fig. 6. Graph of aNobii cities. Node colors are scaled like in Fig. 5. 10 links are not represented.

Mapping the Arabic Blogosphere: Politics, Culture, and Dissent

By Bruce Etling, John Kelly, Robert Faris, and John Palfrey



JUNE 2009

Berkman Center Research Publication No. 2009-06

- **links:**
citations (interactional)
- **colors:**
co-citation communities (“topical”)
- strong geographic coherence, *even though* national clusters not focused on national topics (e.g. youth, women’s rights, bloggers’ rights, poetry)
- *international clusters* related to international media and international political topics (including islam)

STRUCTURE OF THE NETWORK AND METHODS OVERVIEW

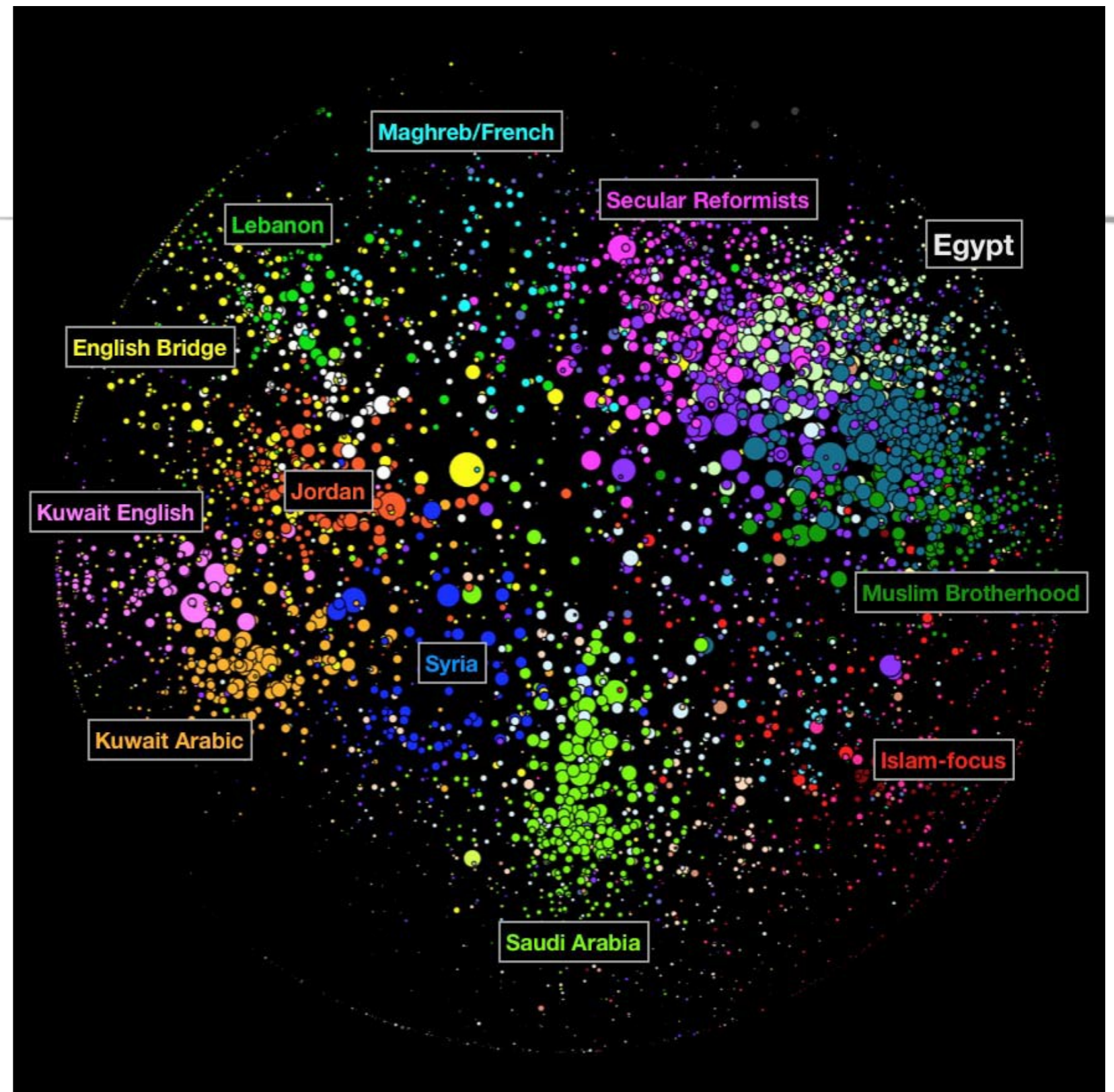


Fig. 1: Map of the Arabic Blogosphere

Multilingual use of Twitter: Social networks at the language frontier

Irene Eleta [↑], Jennifer Golbeck

College of Information Studies and Human-Computer Interaction Lab, University of Maryland, Hornbake Building, South Wing, College Park, MD 20742, USA

List of egos	Text, language	Adjacency list	Network languages
Ego 1	Post 1, en Post 2, en Post 3, es ... Post 50, en	Contact 1, contact 2 Contact 1, contact 3 Contact 2, contact 3 Contact 3, contact 4 ...	Contact 1, en Contact 2, es Contact 3, en Contact 4, en
Ego 2			
....			
Ego 92			

Fig. 1. The data comprises a list of 92 egos, with 50 posts each and language labels, their contacts with a language label, and the social network edges in an adjacency list.

Table 1
Properties of bilingual networks observed in the visualizations.

Properties	
(A) Degree of connection between language groups	(A1) Few connections (A2) Tightly connected
(B) Degree of integration of one language group inside another	(B1) Separated (B2) Partial integration (B3) Complete integration
(C) Relative size of one language group respect to the other	(C1) Similar size (C2) Very different size

Gatekeeper (Fig. 5.1): two language groups connected by a few nodes only, with properties A1, B1, and C1 (12 networks).

Language bridge (Fig. 5.2): two tightly connected language groups, but still separated, with properties A2, B1, and C1 (12 networks).

Peripheral language (Fig. 5.3): a dominant language group connected to a small or not cohesive language group, with properties A1 or A2, B1, and C2 (12).

Union (Fig. 5.4): two tightly connected language groups, where one language group has been penetrated by the other, with properties A2, B2, and C1 or C2 (9 networks).

Integration (Fig. 5.5): one language group inside another with properties A2, B3, and C1 or C2 (17 networks).

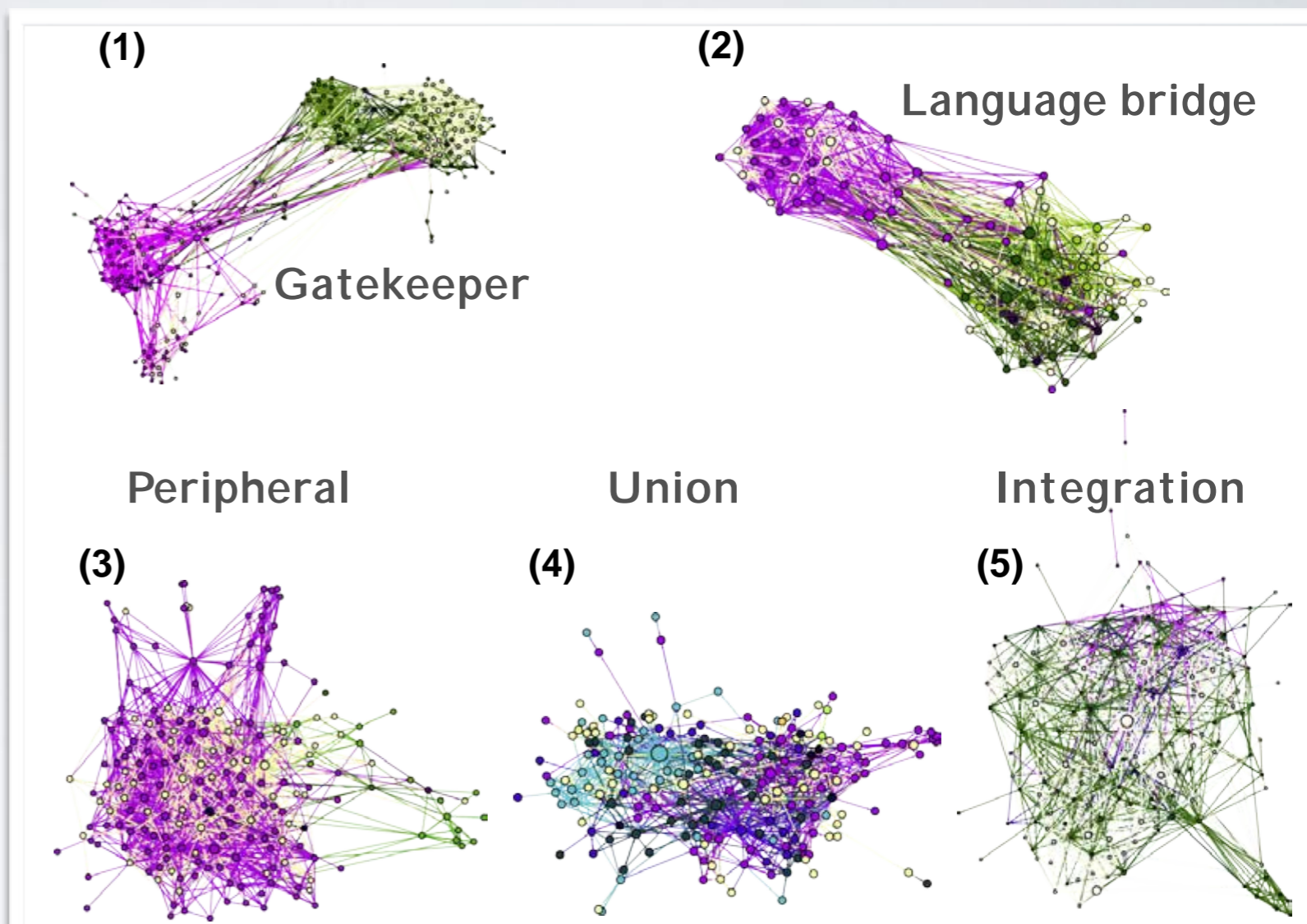


Fig. 5. Networks of five multilingual Twitter users exemplifying the network types. The nodes are their contacts and the edges represent the “follower/following” relationship. Pink nodes post in English and yellow/white is used for nodes with no data. (1) The gatekeeper type; there is a French group on the right side (green) loosely connected with an English group on the left. (2) Represents the language bridge type; in this network, the Japanese group on the right side (green) is tightly connected with the English group on the left, and intermingled with bilingual users (violet and dark green). (3) The peripheral language, Portuguese, on the right side (green) of the dominant English group. (4) Exemplifies the union type, where the Greek group on the left (turquoise) is merging and mixing with the English group on the right, and there are many bilinguals (violet and dark green). (5) Illustrates the integration type; the English group being inside the Arabic (green). Visualizations made with Gephi. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Sociolinguistic Analysis of Twitter in Multilingual Societies^{*}

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HT'14

■ AR ■ AR-EN ■ EN ■ EN-TL

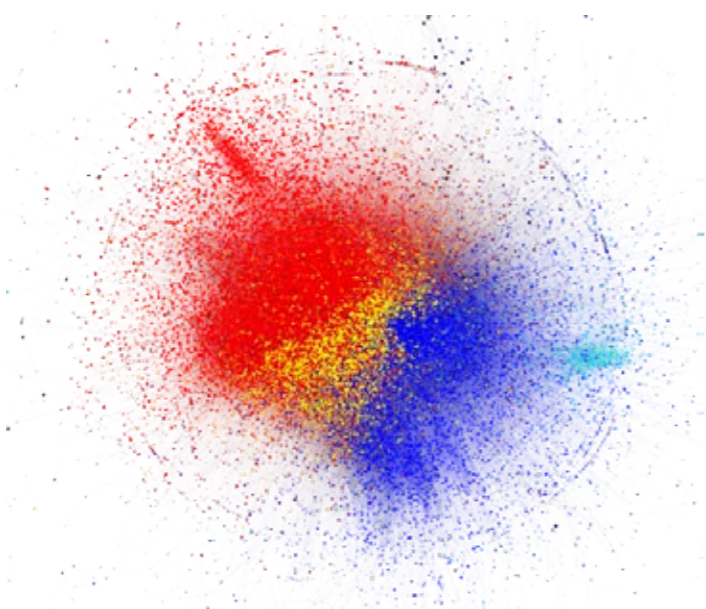
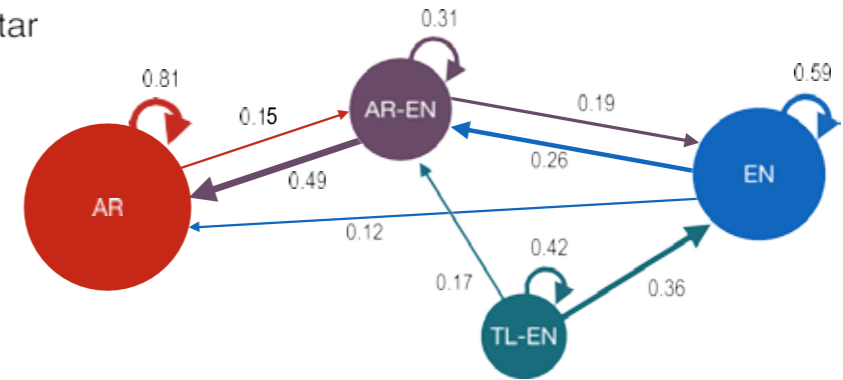
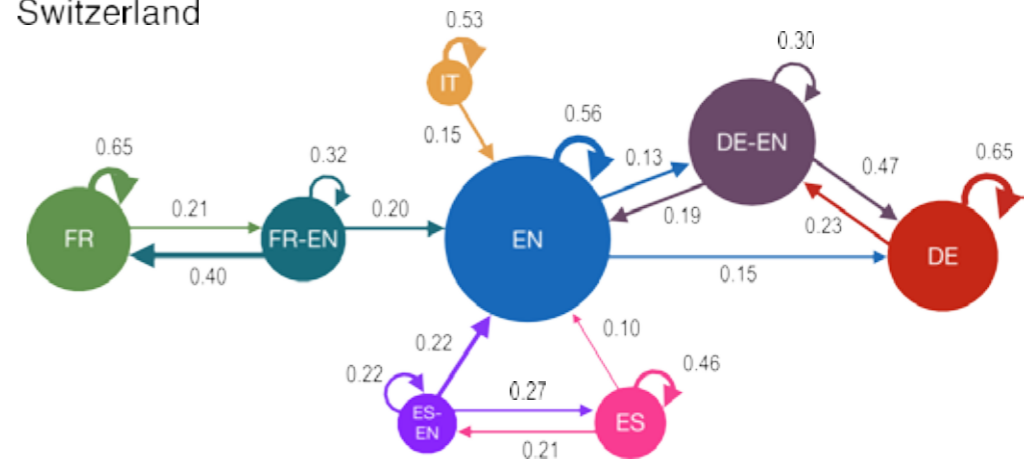


Figure 1: Visualization of Qatar Twitter network. Each node and edge represents user and followings in the Twitter networks. Each node is colored by the language usage from corresponding user's tweets. AR-EN Bilingual users are located between monolingual clusters.

Qatar



Switzerland



Quebec

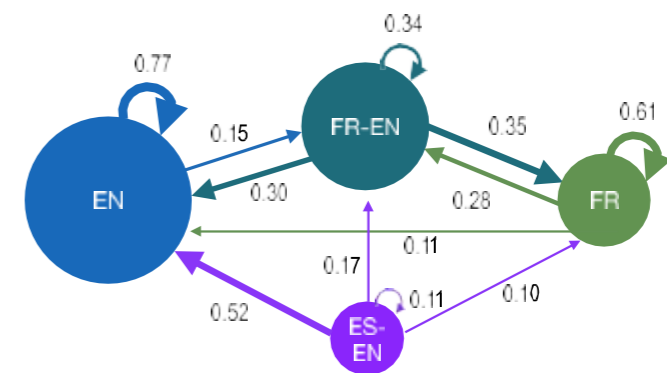


Figure 4: Following patterns among lingua groups. The color of an edge corresponds to the source color of the edge. Following

"We found that from all bilingual groups in the three regions, bilingual users post informational and political tweets for the local audience in local language. They, on the other hand, post events, tourism, photography, and other leisure-related tweets in English for the non-local audience."