NETWORKS, CLUSTERS, INFLUENCERS

Introduction to Social Network Analysis (SNA) for journalists

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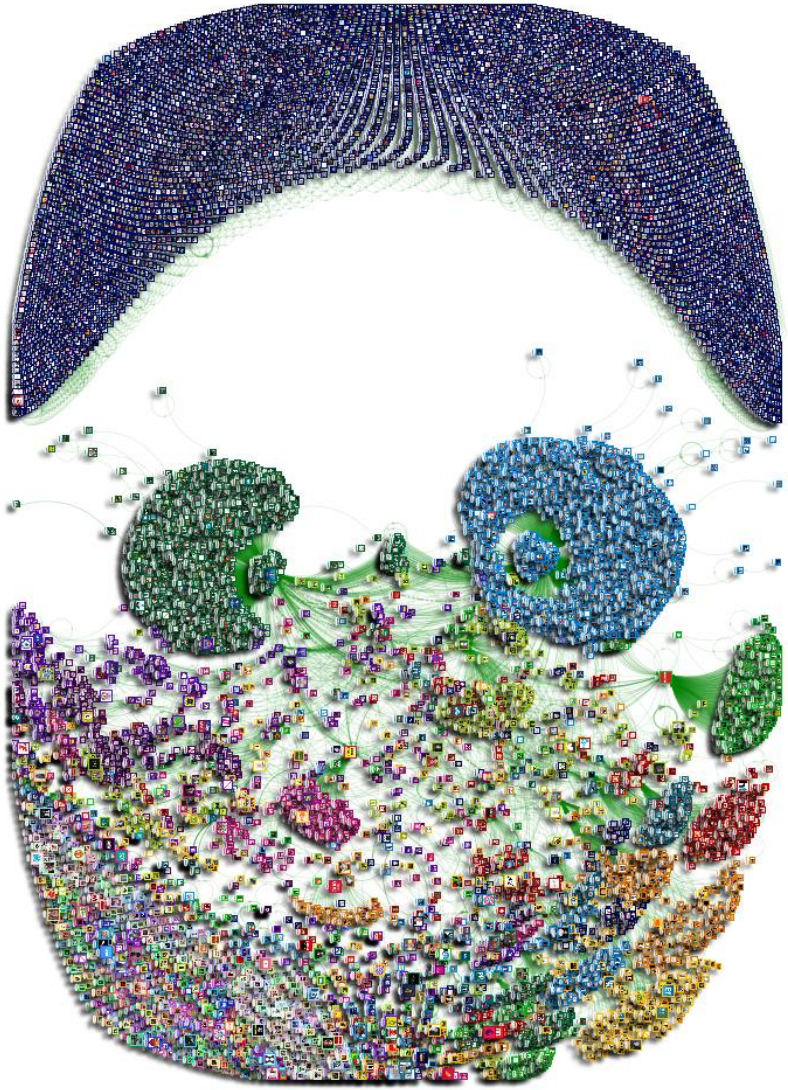
June 9th, 2020

CONTENTS



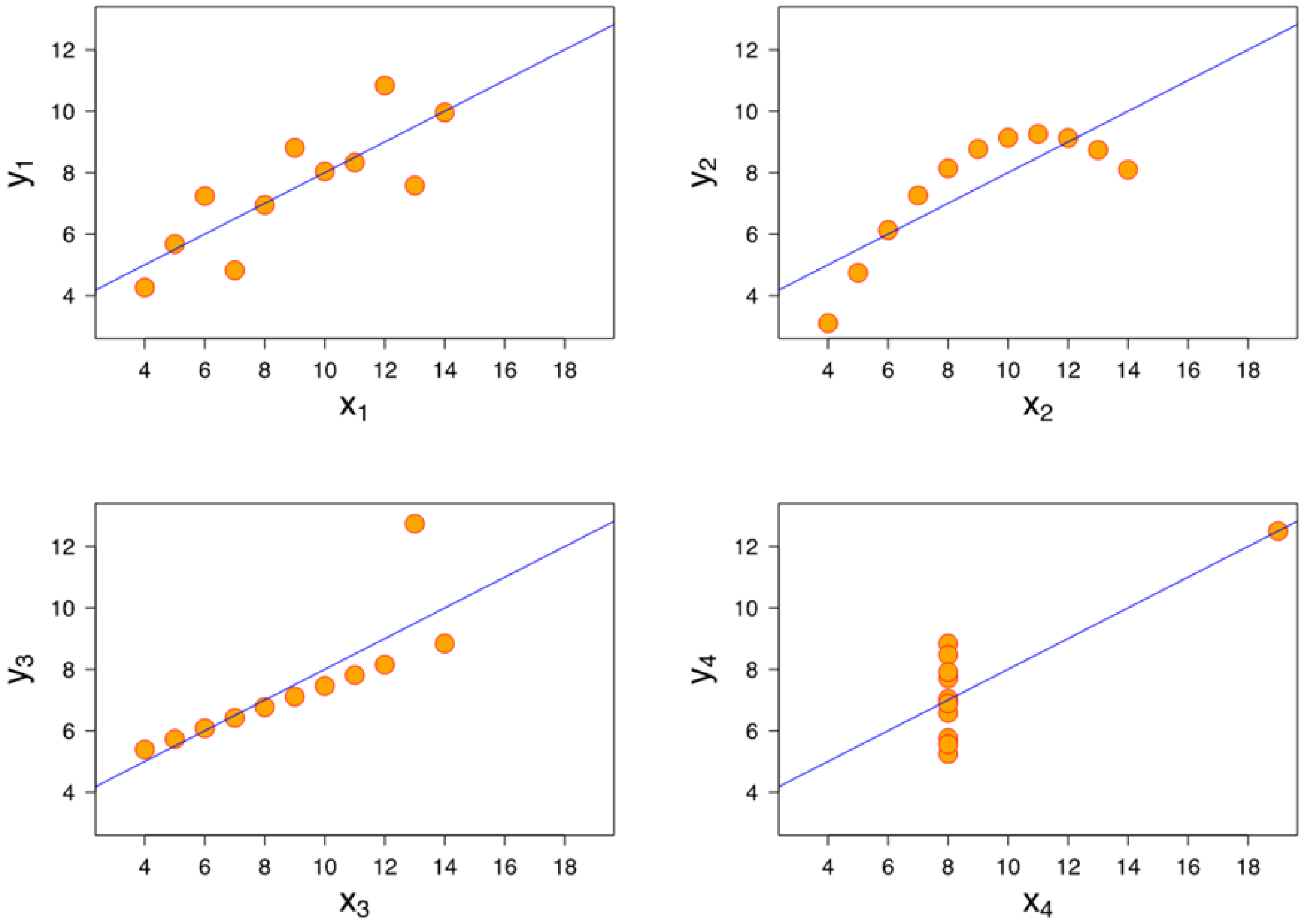
Why Dataviz Matters

1		2		3		4	
x	y	x	y	x	y	x	y
10.0	8.04	10.0	9.14	10.0	7.46	8.0	6.58
8.0	6.95	8.0	8.14	8.0	6.77	8.0	5.76
13.0	7.58	13.0	8.74	13.0	12.74	8.0	7.71
9.0	8.81	9.0	8.77	9.0	7.11	8.0	8.84
11.0	8.33	11.0	9.26	11.0	7.81	8.0	8.47
14.0	9.96	14.0	8.10	14.0	8.84	8.0	7.04
6.0	7.24	6.0	6.13	6.0	6.08	8.0	5.25
4.0	4.26	4.0	3.10	4.0	5.39	19.0	12.50
12.0	10.84	12.0	9.13	12.0	8.15	8.0	5.56
7.0	4.82	7.0	7.26	7.0	6.42	8.0	7.91
5.0	5.68	5.0	4.74	5.0	5.73	8.0	6.89

Anscombe's Quartet

Property	Value
Mean of x	9.0
Variance of x	11.0
Mean of y	7.5
Variance of y	4.12
Correlation	0.816
Linear regression	$y = 3 + 0.5x$

Why Dataviz Matters



Anscombe's Quartet

Property	Value
Mean of *x*	9.0
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Mean of *y*	7.5
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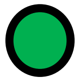
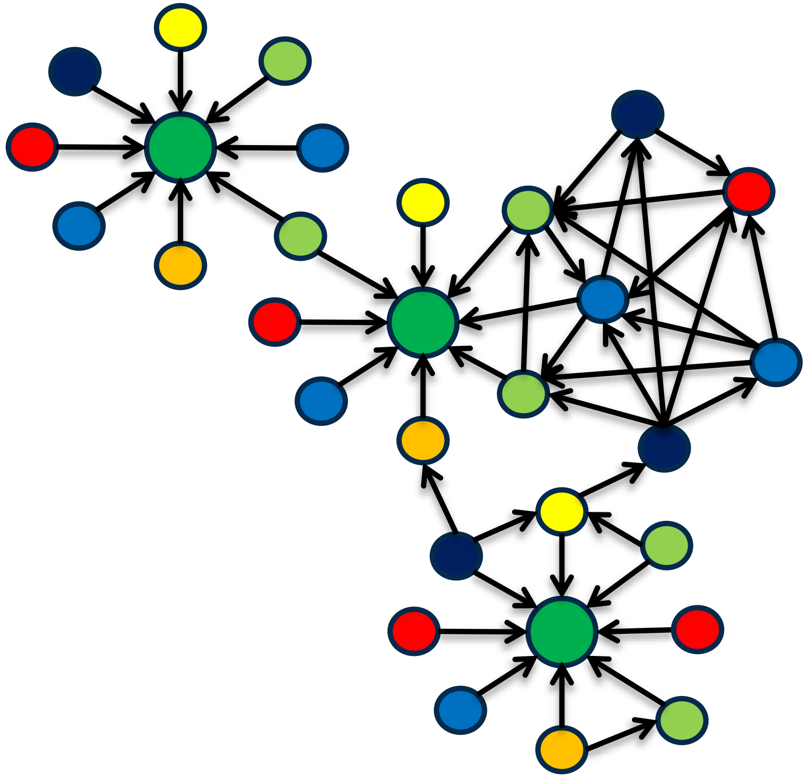
Linear regression	$y = 3 + 0.5x$

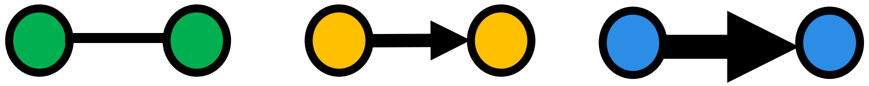
Network Basics

Network = collection of connections

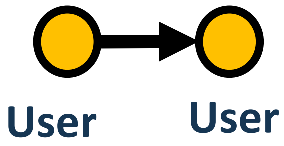
- **Edge** = connection, relationship / like, retweet, ... 
- **Vertex** = node, entity / person, user, company, ... 
- **Cluster** = group of vertices
- **Graph** = network map

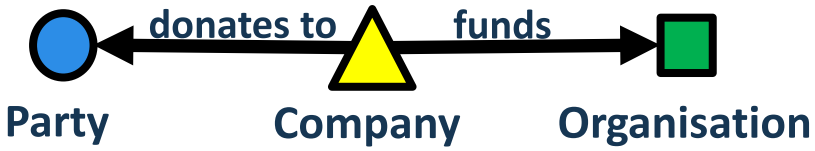


Undirected vs. **Directed** vs. **Weighted** networks



Single-mode vs. **multi-modal** networks





Network Tools and Data

Tools

- NodeXL, Gephi, Socioviz, Netlytic, Neo4J, …

File types

- Excel, csv
- GEXF, GDF, GraphML, UCINET, Pajek

Network Data Sources

- Social Media Platform APIs
- Digital Methods Initiative (DMI)
- databases / leaked data

All you need:

Edge table

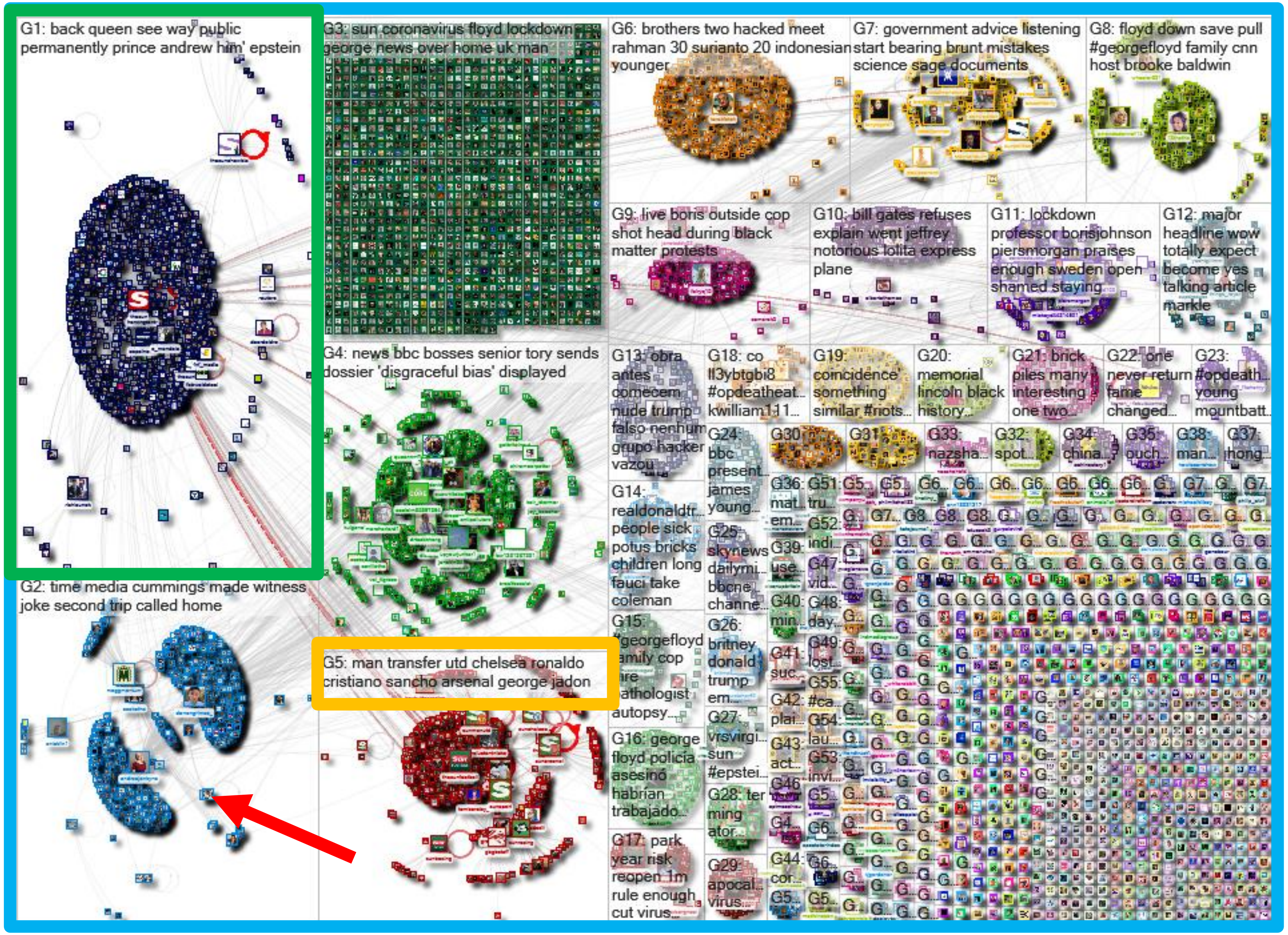
	A	B
1	Vertex 1	Vertex 2
2	Lenny	Carl
3	Carl	Barney
4	Barney	Moe
5	Monty	Waylon
6	Homer	Marge
7	…	…

(Vertex table)

	A
1	Vertex
2	Lenny
3	Carl
4	Maggie
5	Monty
6	Waylon
7	…

Additional columns = **Metadata (!)**

Social Network Analysis



Search term url:thesun.co.uk on June 3, 2020: https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=228728

Network Overview
- Size / Density / Modularity

Cluster Analysis
- Cluster Algorithm
- Density

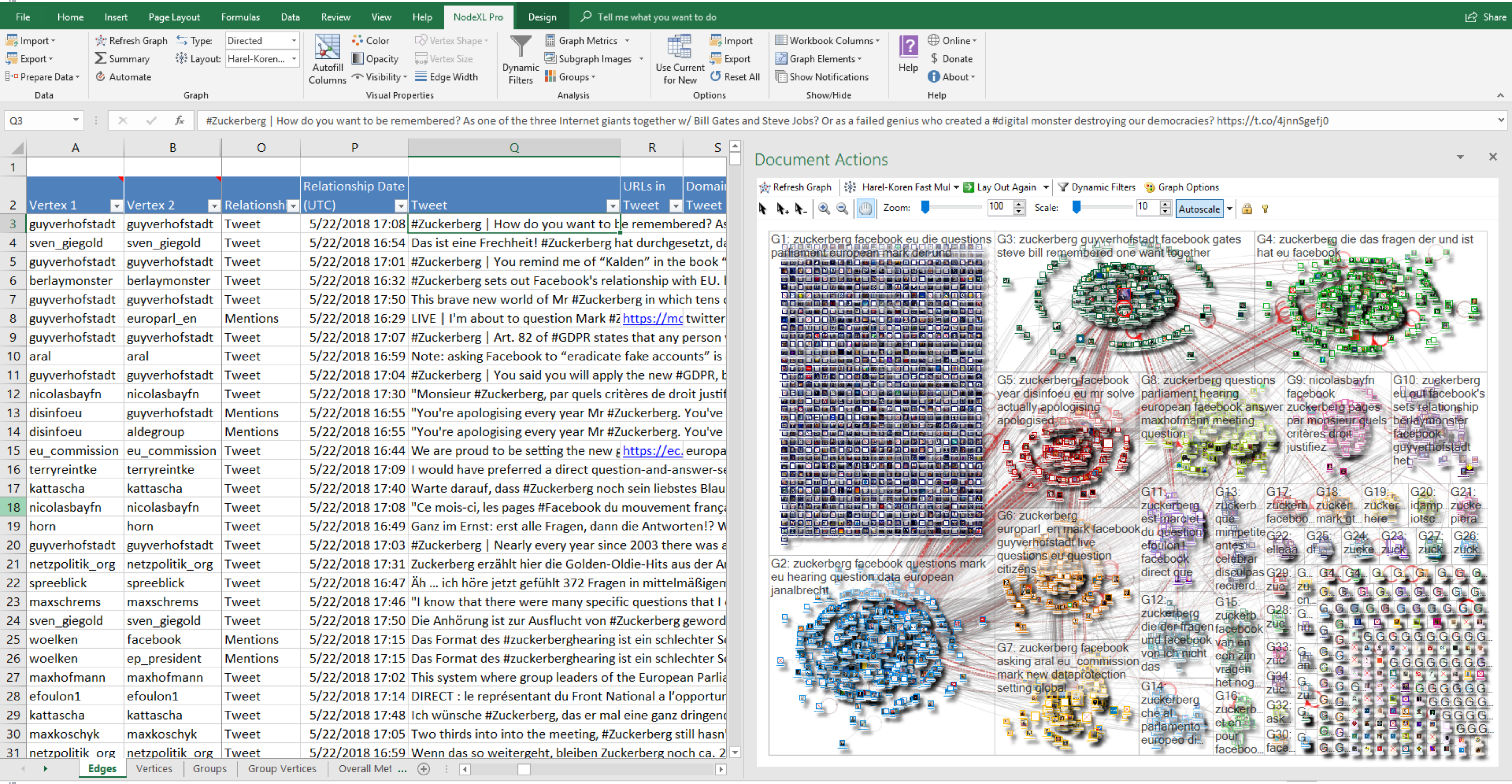
Vertex Metrics
- Centrality: Degree, Betweenness, Closeness, Eigenvector, …

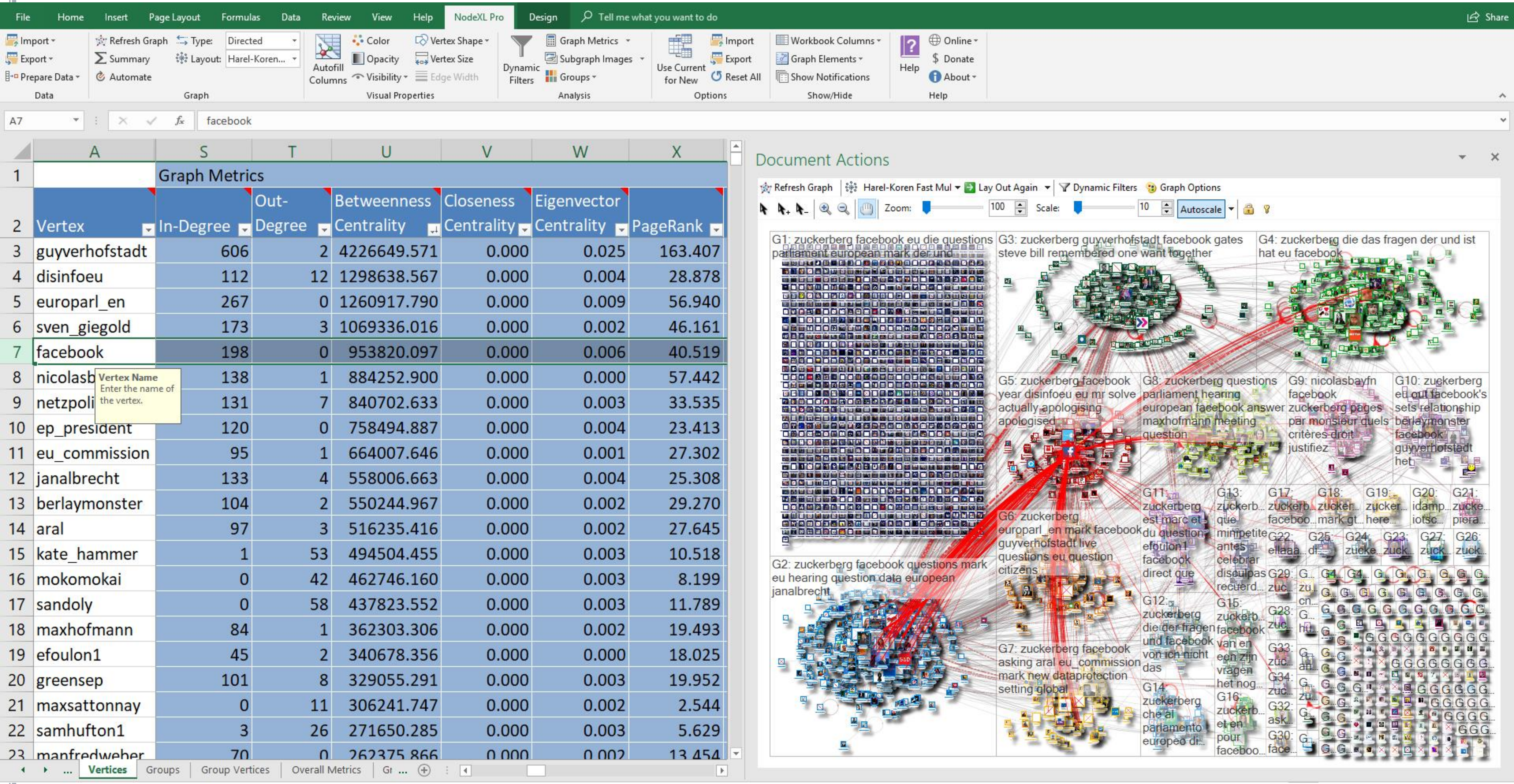
Content Analysis
- Top hashtags, words, URLs, …
- Sentiment, time series

Visual Analysis
- Layout Algorithms
- Group-In-A-Box: Treemap
- Harel-Koren Fast Multiscale

$$
\begin{aligned}
Q &= \frac{1}{2m}\sum_{vw}\left[A_{vw} - \frac{k_v k_w}{2m}\right]\sum_i \delta(c_v,i)\delta(c_w,i) \\
&= \sum_i\left[\frac{1}{2m}\sum_{vw} A_{vw}\,\delta(c_v,i)\delta(c_w,i)\right. \\
&\qquad \left. - \frac{1}{2m}\sum_v k_v\,\delta(c_v,i)\frac{1}{2m}\sum_w k_w\delta(c_w,i)\right] \\
&= \sum_i (e_{ii} - a_i^2). \qquad (7)
\end{aligned}
$$

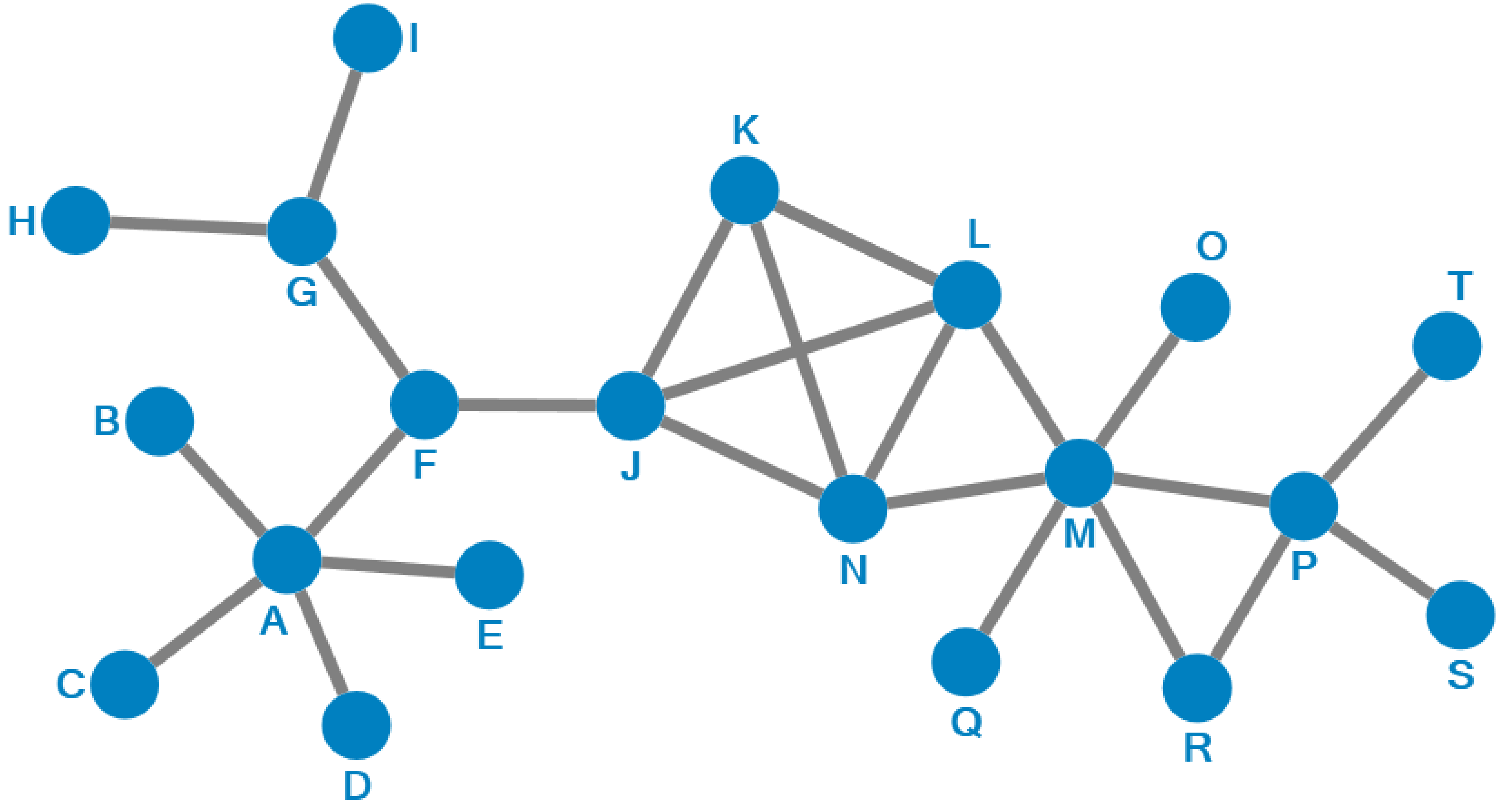
Clauset, Newman, Moore (2004)


File Home Insert Page Layout Formulas Data Review View Help NodeXL Pro Design Tell me what you want to do Share
Import Export Prepare Data Refresh Graph Summary Automate Type: Directed Layout: Harel-Koren... Autofill Columns Color Opacity Visibility Vertex Shape Vertex Size Edge Width Dynamic Filters Graph Metrics Subgraph Images Groups Use Current for New Import Export Reset All Workbook Columns Graph Elements Show Notifications Help Online Donate About
Data Graph Visual Properties Analysis Options Show/Hide Help
Q3
#Zuckerberg | How do you want to be remembered? As one of the three Internet giants together w/ Bill Gates and Steve Jobs? Or as a failed genius who created a #digital monster destroying our democracies? https://t.co/4jnnSgefj0
Vertex 1 | Vertex 2 | Relationship | Relationship Date (UTC) | Tweet | URLs in Tweet | Domain in Tweet
guyverhofstadt guyverhofstadt Tweet 5/22/2018 17:08 #Zuckerberg | How do you want to be remembered? As
sven_giegold sven_giegold Tweet 5/22/2018 16:54 Das ist eine Frechheit! #Zuckerberg hat durchgesetzt, da
guyverhofstadt guyverhofstadt Tweet 5/22/2018 17:01 #Zuckerberg | You remind me of “Kalden” in the book “
berlaymonster berlaymonster Tweet 5/22/2018 16:32 #Zuckerberg sets out Facebook's relationship with EU.
guyverhofstadt guyverhofstadt Tweet 5/22/2018 17:50 This brave new world of Mr #Zuckerberg in which tens
guyverhofstadt europarl_en Mentions 5/22/2018 16:29 LIVE | I'm about to question Mark #Z https://mc twitter
guyverhofstadt guyverhofstadt Tweet 5/22/2018 17:07 #Zuckerberg | Art. 82 of #GDPR states that any person
aral aral Tweet 5/22/2018 16:59 Note: asking Facebook to “eradicate fake accounts” is
guyverhofstadt guyverhofstadt Tweet 5/22/2018 17:04 #Zuckerberg | You said you will apply the new #GDPR,
nicolasbayfn nicolasbayfn Tweet 5/22/2018 17:30 "Monsieur #Zuckerberg, par quels critères de droit justif
disinfoeu guyverhofstadt Mentions 5/22/2018 16:55 "You're apologising every year Mr #Zuckerberg. You've
disinfoeu aldegroup Mentions 5/22/2018 16:55 "You're apologising every year Mr #Zuckerberg. You've
eu_commission eu_commission Tweet 5/22/2018 16:44 We are proud to be setting the new g https://ec. europa
terryreintke terryreintke Tweet 5/22/2018 17:09 I would have preferred a direct question-and-answer-se
kattascha kattascha Tweet 5/22/2018 17:40 Warte darauf, dass #Zuckerberg noch sein liebstes Blau
nicolasbayfn nicolasbayfn Tweet 5/22/2018 17:08 "Ce mois-ci, les pages #Facebook du mouvement franç
horn horn Tweet 5/22/2018 16:49 Ganz im Ernst: erst alle Fragen, dann die Antworten!? W
guyverhofstadt guyverhofstadt Tweet 5/22/2018 17:03 #Zuckerberg | Nearly every year since 2003 there was a
netzpolitik_org netzpolitik_org Tweet 5/22/2018 17:31 Zuckerberg erzählt hier die Golden-Oldie-Hits aus der A
spreeblick spreeblick Tweet 5/22/2018 16:47 Äh ... ich höre jetzt gefühlt 372 Fragen in mittelmäßigen
maxschrems maxschrems Tweet 5/22/2018 17:46 "I know that there were many specific questions that I
sven_giegold sven_giegold Tweet 5/22/2018 17:50 Die Anhörung ist zur Ausflucht von #Zuckerberg geword
woelken facebook Mentions 5/22/2018 17:15 Das Format des #zuckerberghearing ist ein schlechter S
woelken ep_president Mentions 5/22/2018 17:15 Das Format des #zuckerberghearing ist ein schlechter S
maxhofmann maxhofmann Tweet 5/22/2018 17:02 This system where group leaders of the European Parlia
efoulon1 efoulon1 Tweet 5/22/2018 17:14 DIRECT : le représentant du Front National a l’opportur
kattascha kattascha Tweet 5/22/2018 17:48 Ich wünsche #Zuckerberg, das er mal eine ganz dringend
maxkoschyk maxkoschyk Tweet 5/22/2018 17:05 Two thirds into into the meeting, #Zuckerberg still hasn
netzpolitik_org netzpolitik_org Tweet 5/22/2018 16:59 Wenn das so weitergeht, bleiben Zuckerberg noch ca. 2
Edges Vertices Groups Group Vertices Overall Met ...
Document Actions
Refresh Graph Harel-Koren Fast Mul Lay Out Again Dynamic Filters Graph Options
Zoom: 100 Scale: 10 Autoscale
G1: zuckerberg facebook eu die questions parliament european mark der und
G3: zuckerberg guyverhofstadt facebook gates steve bill remembered one want together
G4: zuckerberg die das fragen der und ist hat eu facebook
G5: zuckerberg facebook year disinfoeu eu mr solve actually apologising apologised
G8: zuckerberg questions parliament hearing european facebook answer maxhofmann meeting question
G9: nicolasbayfn facebook zuckerberg pages par monsieur quels critères droit justifiez
G10: zuckerberg eu out facebook's sets relationship berlaymonster facebook guyverhofstadt het
G2: zuckerberg facebook questions mark eu hearing question data european janalbrecht
G6: zuckerberg europarl_en mark facebook guyverhofstadt live questions eu question citizens
G7: zuckerberg facebook asking aral eu_commission mark new dataprotection setting global



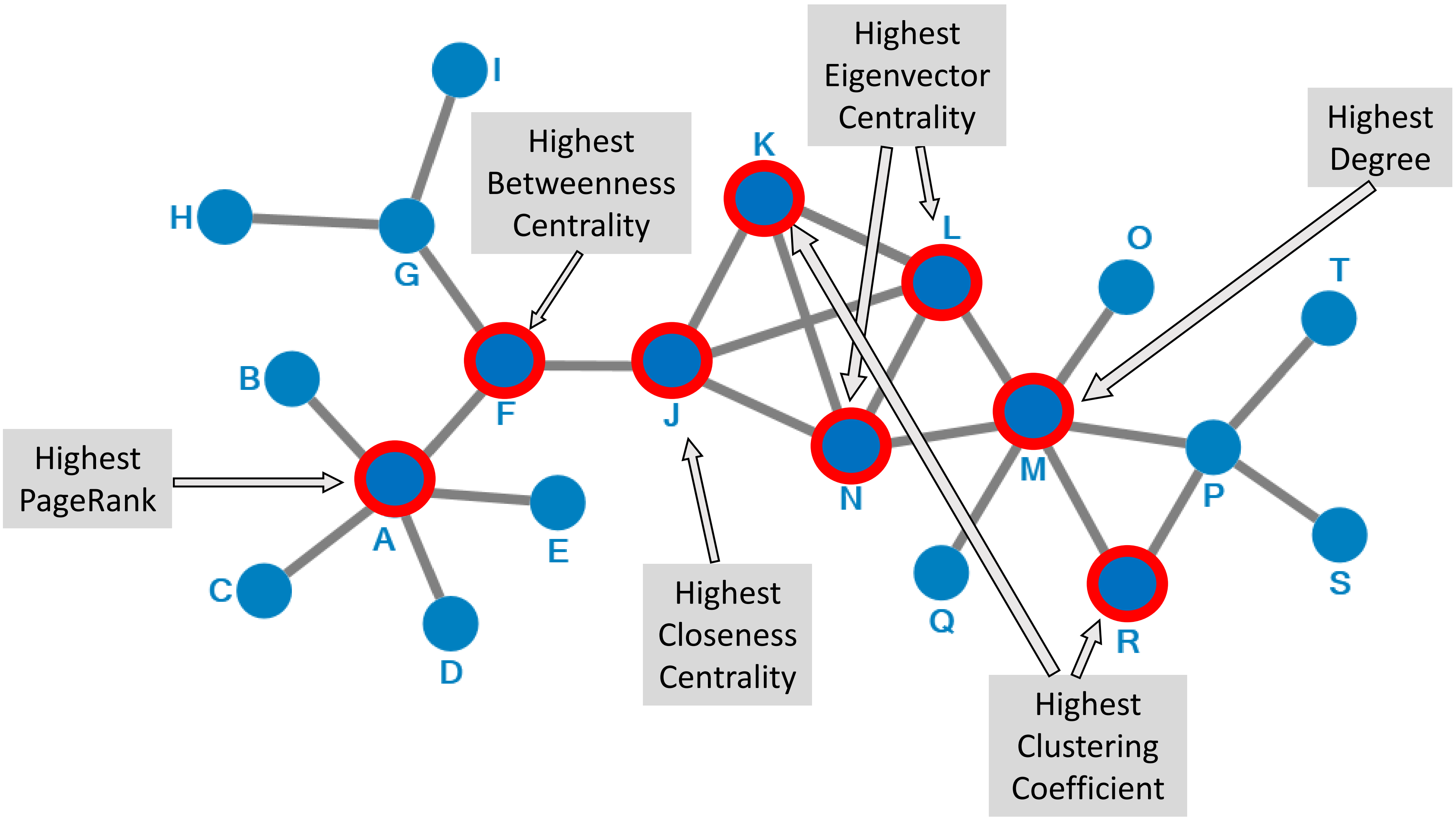
	Graph Metrics					
Vertex	In-Degree	Out-Degree	Betweenness Centrality	Closeness Centrality	Eigenvector Centrality	PageRank
guyverhofstadt	606	2	4226649.571	0.000	0.025	163.407
disinfoeu	112	12	1298638.567	0.000	0.004	28.878
europarl_en	267	0	1260917.790	0.000	0.009	56.940
sven_giegold	173	3	1069336.016	0.000	0.002	46.161
facebook	198	0	953820.097	0.000	0.006	40.519
nicolasb	138	1	884252.900	0.000	0.000	57.442
netzpoli	131	7	840702.633	0.000	0.003	33.535
ep_president	120	0	758494.887	0.000	0.004	23.413
eu_commission	95	1	664007.646	0.000	0.001	27.302
janalbrecht	133	4	558006.663	0.000	0.004	25.308
berlaymonster	104	2	550244.967	0.000	0.002	29.270
aral	97	3	516235.416	0.000	0.002	27.645
kate_hammer	1	53	494504.455	0.000	0.003	10.518
mokomokai	0	42	462746.160	0.000	0.003	8.199
sandoly	0	58	437823.552	0.000	0.003	11.789
maxhofmann	84	1	362303.306	0.000	0.002	19.493
efoulon1	45	2	340678.356	0.000	0.000	18.025
greensep	101	8	329055.291	0.000	0.003	19.952
maxsattonnay	0	11	306241.747	0.000	0.002	2.544
samhufton1	3	26	271650.285	0.000	0.003	5.629
manfredweber	70	0	262375.866	0.000	0.002	13.454

MEASURING INFLUENCE: VERTEX METRICS



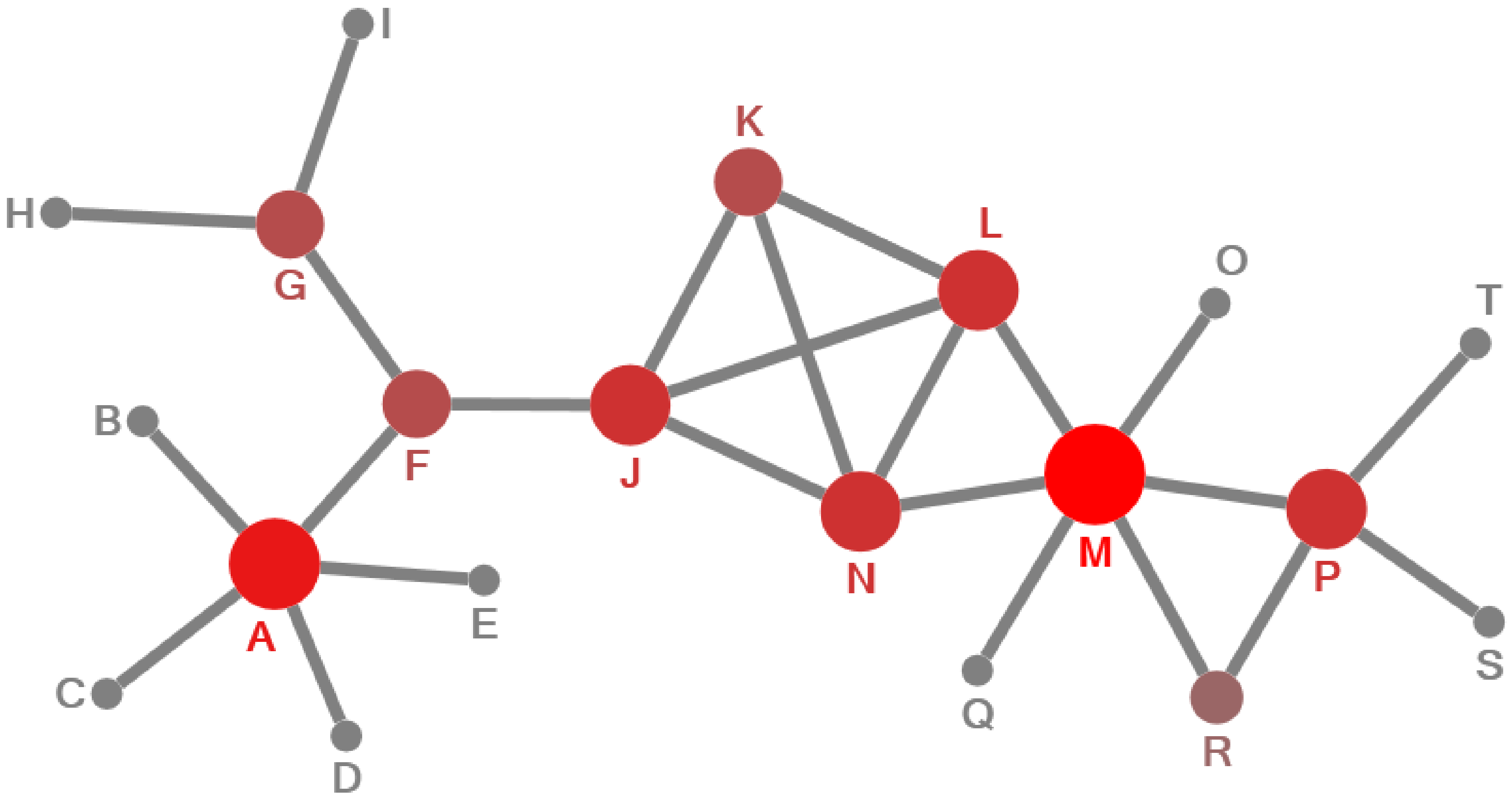
Derived from Borgatti (2006)

Measuring influence: Vertex Metrics



DEGREE

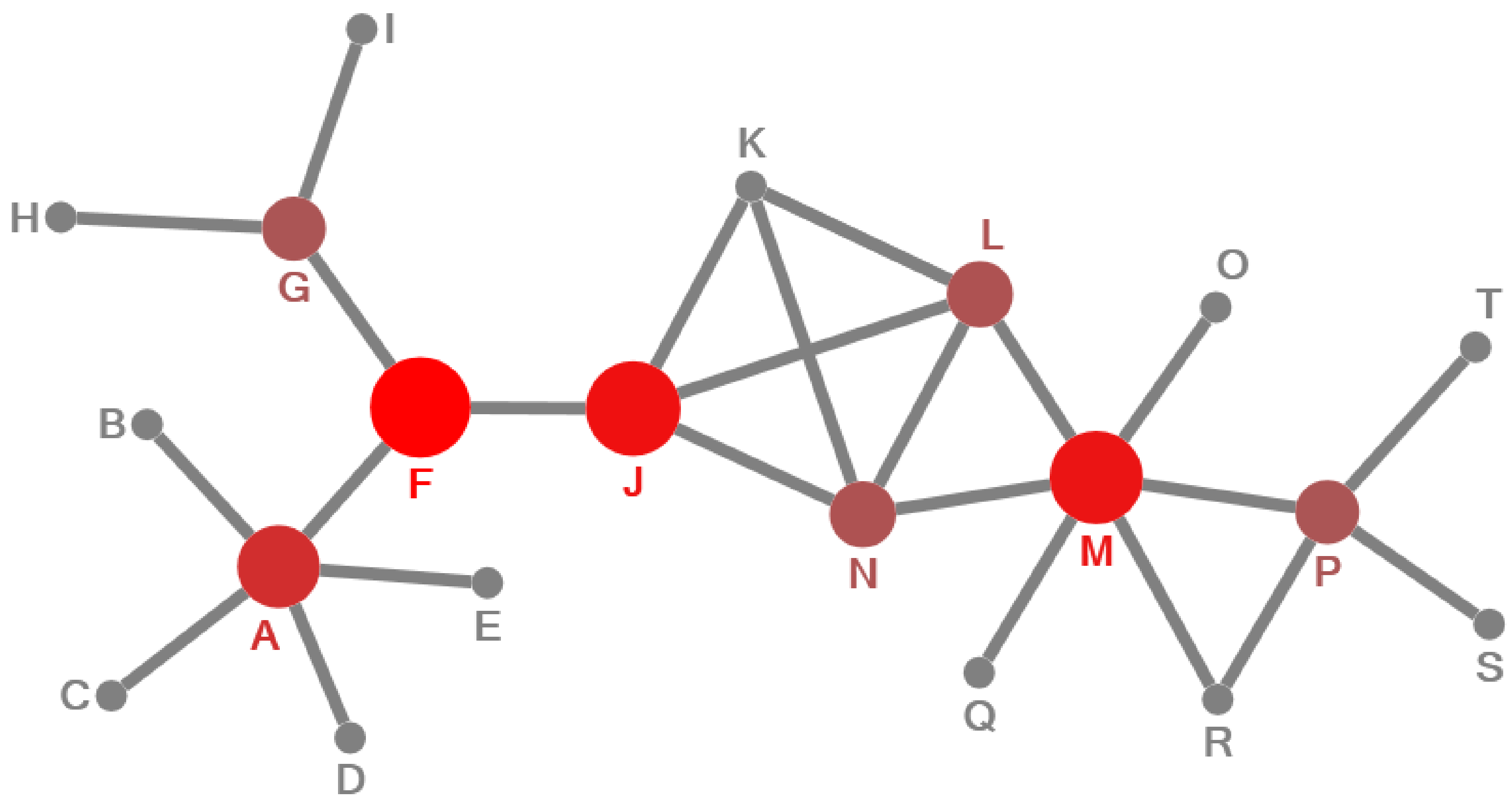
Vertex	Degree
M	6
A	5
L	4
N	4
J	4
P	4
K	3
G	3
F	3
R	2



Derived from Borgatti (2006)

BETWEENNESS CENTRALITY

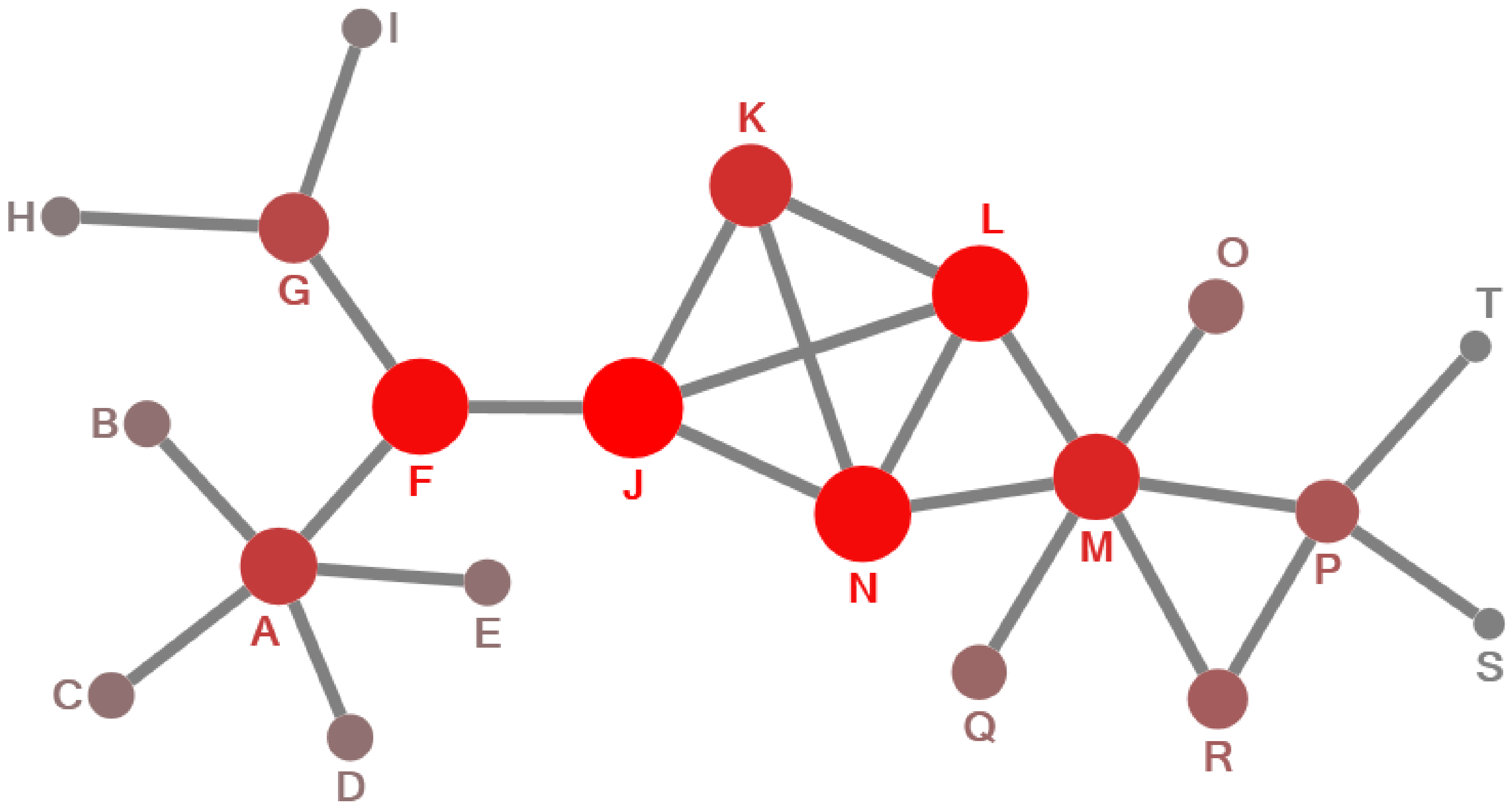
Vertex	Betweenness Centrality
F	103.000
J	90.000
M	87.000
A	66.000
L	38.500
N	38.500
P	35.000
G	35.000
K	0.000
R	0.000



Derived from Borgatti (2006)

Closeness Centrality

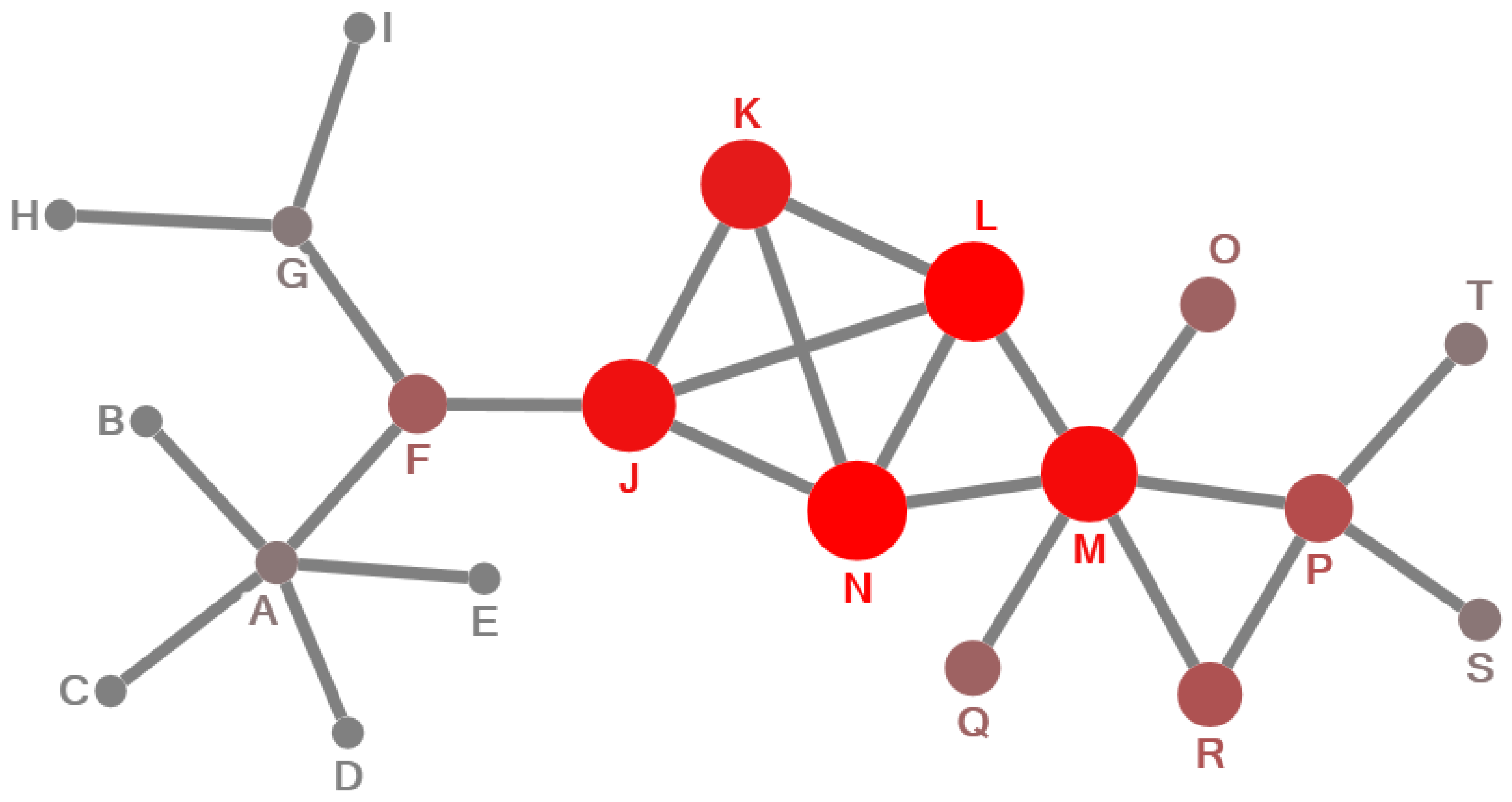
Vertex	Closeness Centrality
J	0.021
F	0.020
L	0.020
N	0.020
M	0.018
K	0.018
A	0.017
G	0.016
P	0.015
R	0.014



Derived from Borgatti (2006)

Eigenvector Centrality

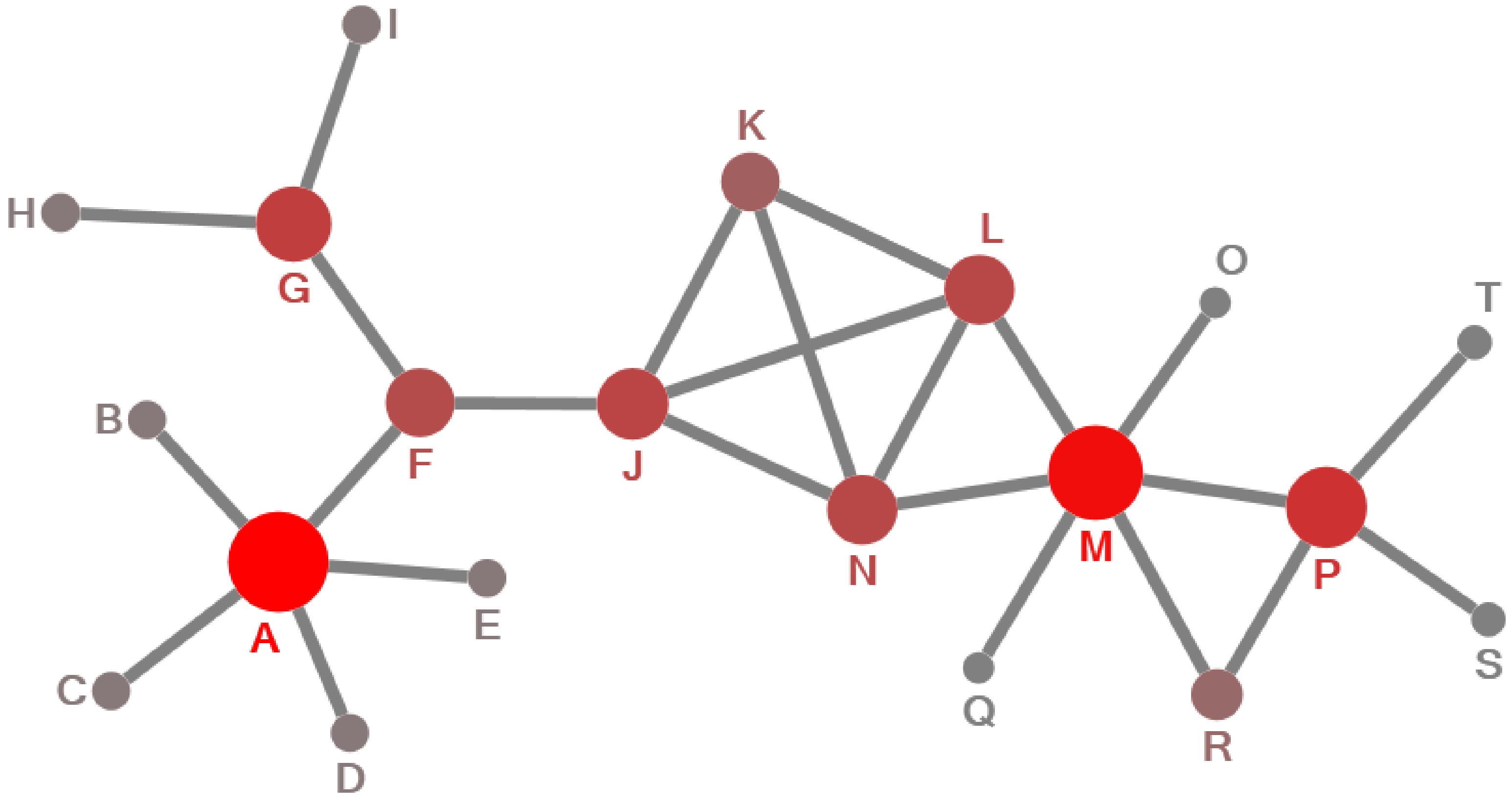
Vertex	Eigenvector Centrality
L	0.146
N	0.146
M	0.135
J	0.126
K	0.116
P	0.063
R	0.055
F	0.044
O	0.038
Q	0.038



Derived from Borgatti (2006)

PageRank

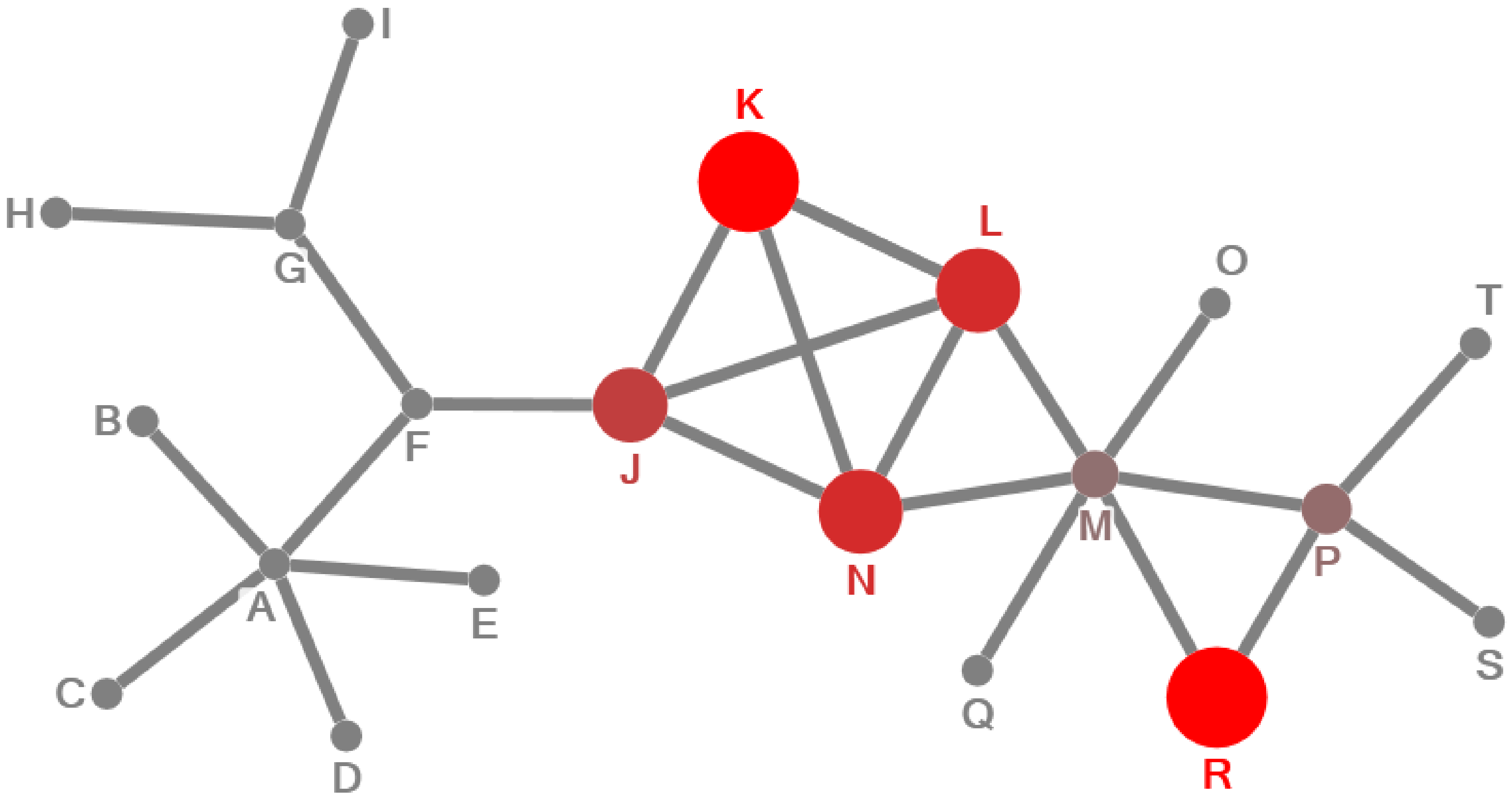
Vertex	PageRank
A	2.410
M	2.177
P	1.656
G	1.471
J	1.338
L	1.298
N	1.298
F	1.261
K	0.986
R	0.810



Derived from Borgatti (2006)

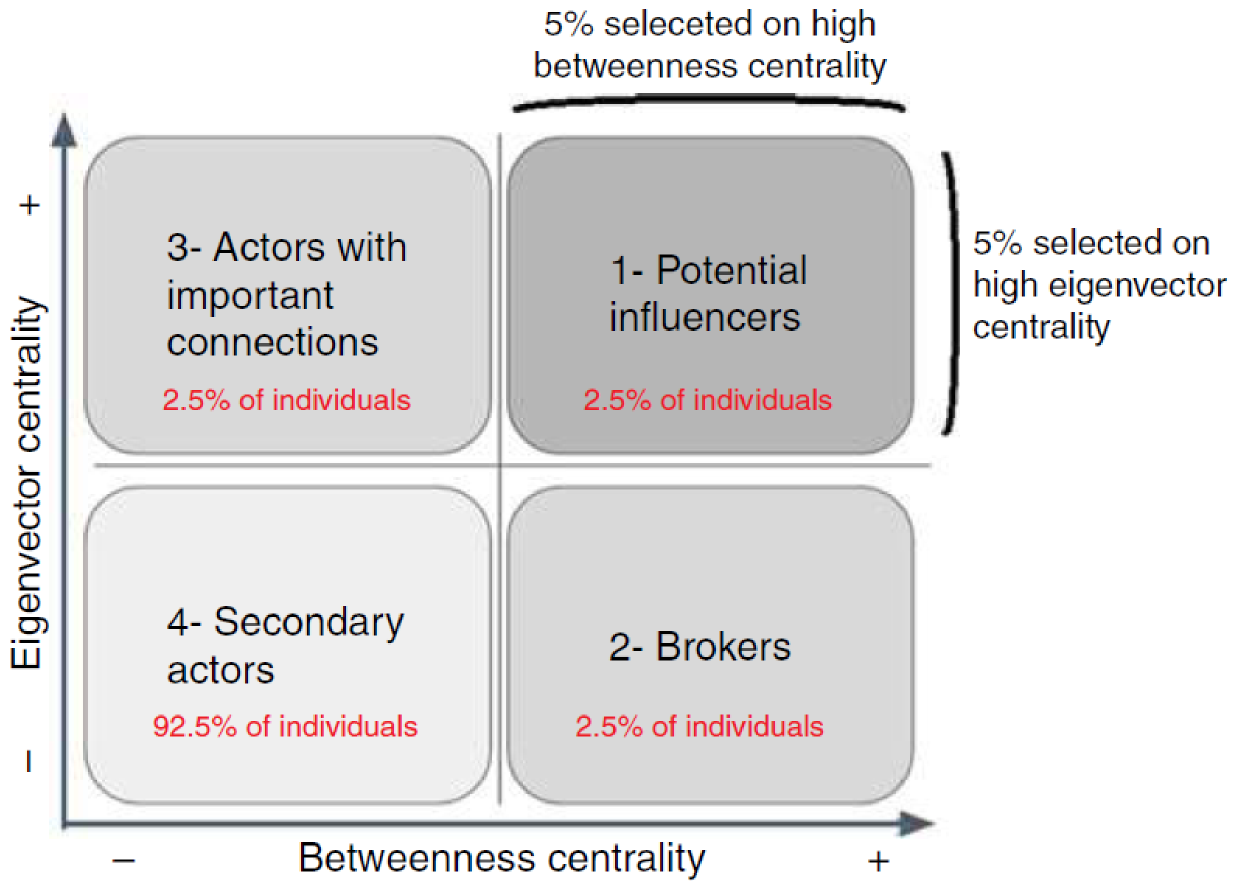
CLUSTERING COEFFICIENT

Vertex	Clustering Coefficient
K	1.000
R	1.000
L	0.667
N	0.667
J	0.500
P	0.167
M	0.133
A	0.000
G	0.000
F	0.000



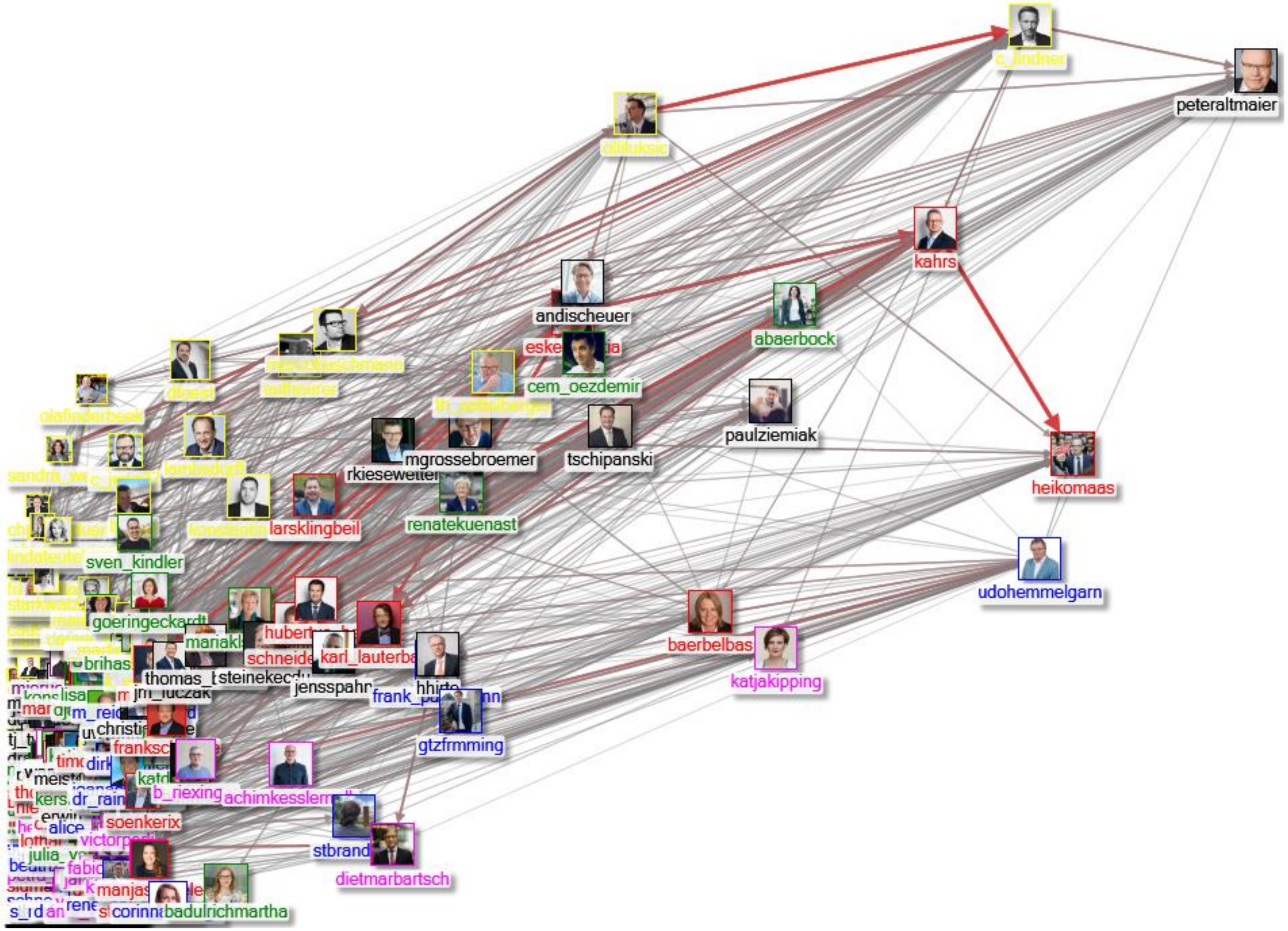
Derived from Borgatti (2006)

MEASURING INFLUENCE: VERTEX METRICS



Litterio et.al. 2017 p. 354

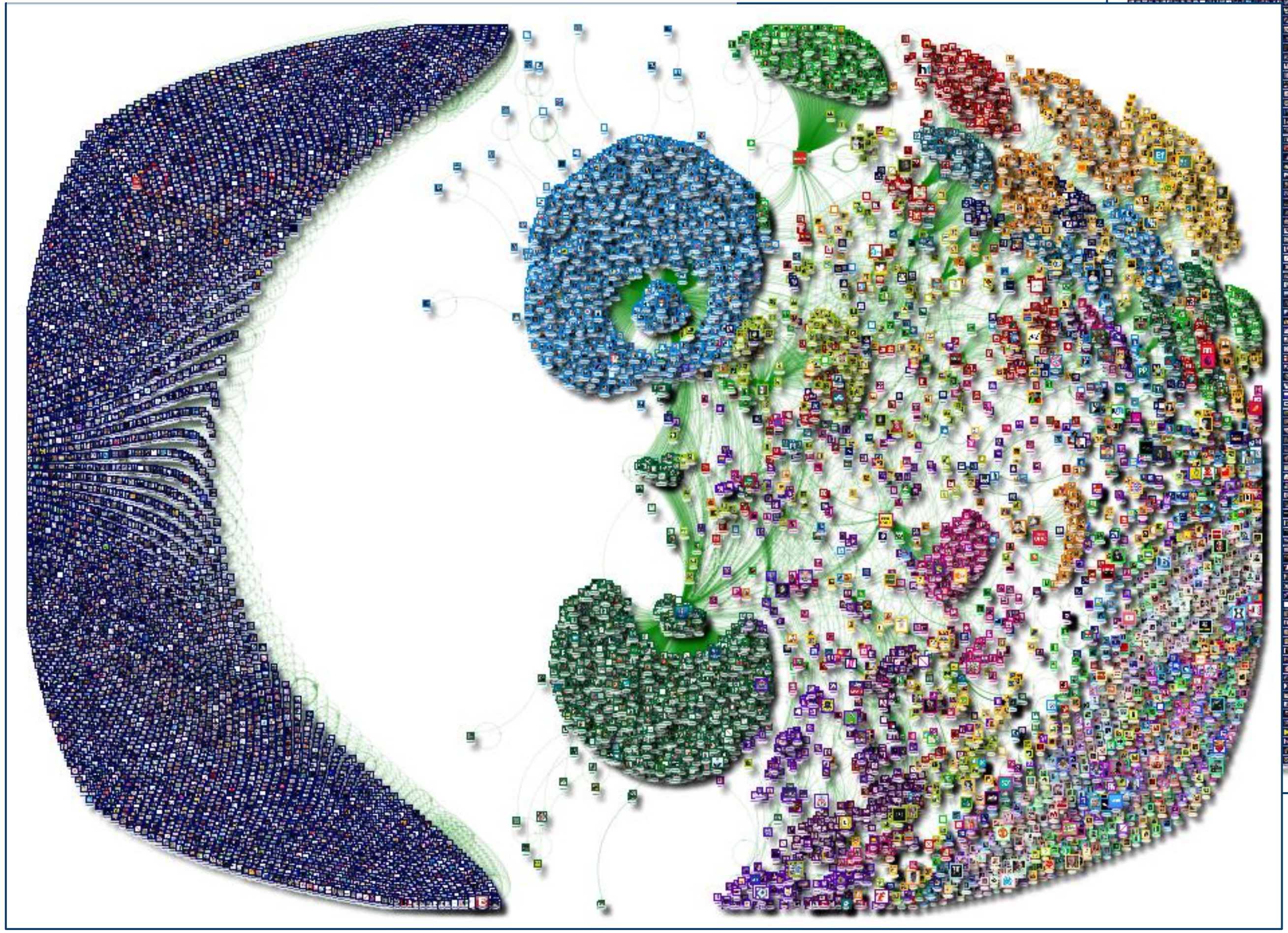
MEASURING INFLUENCE: VERTEX METRICS

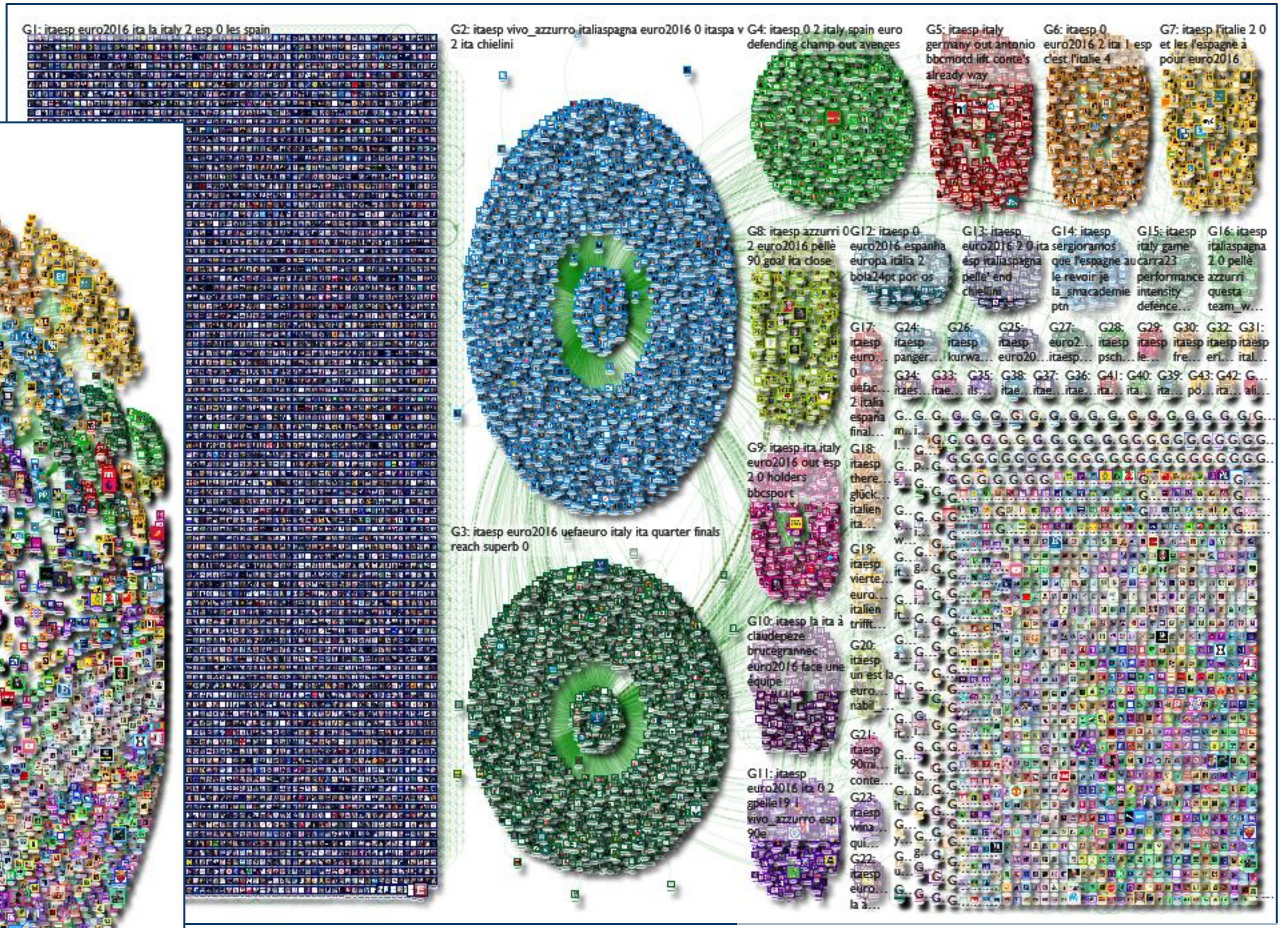


MdB Influencer Layout August 2019: https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=209098

VISUAL ANALYIS: LAYOUT OPTIONS

Entire Graph Layout

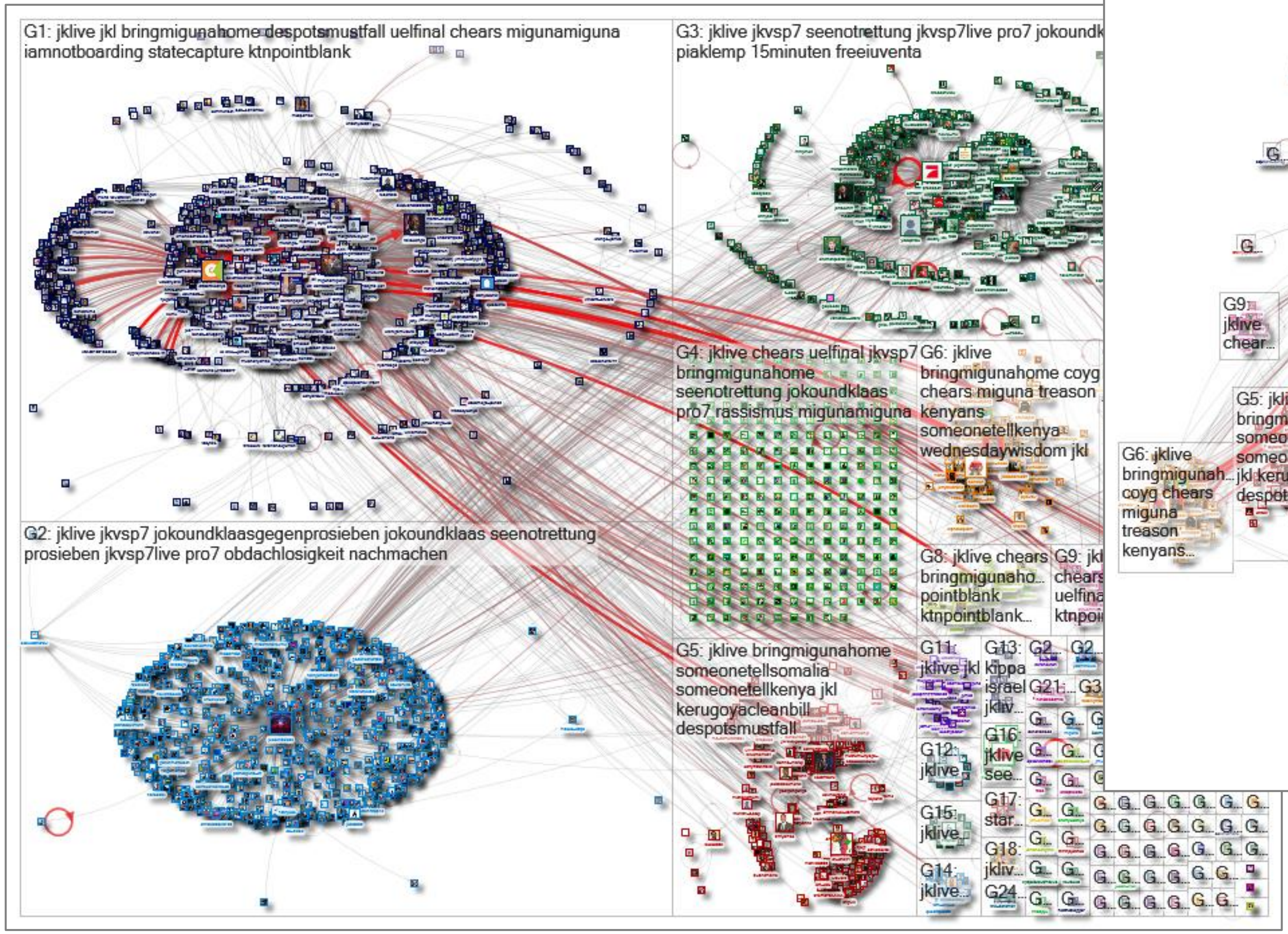


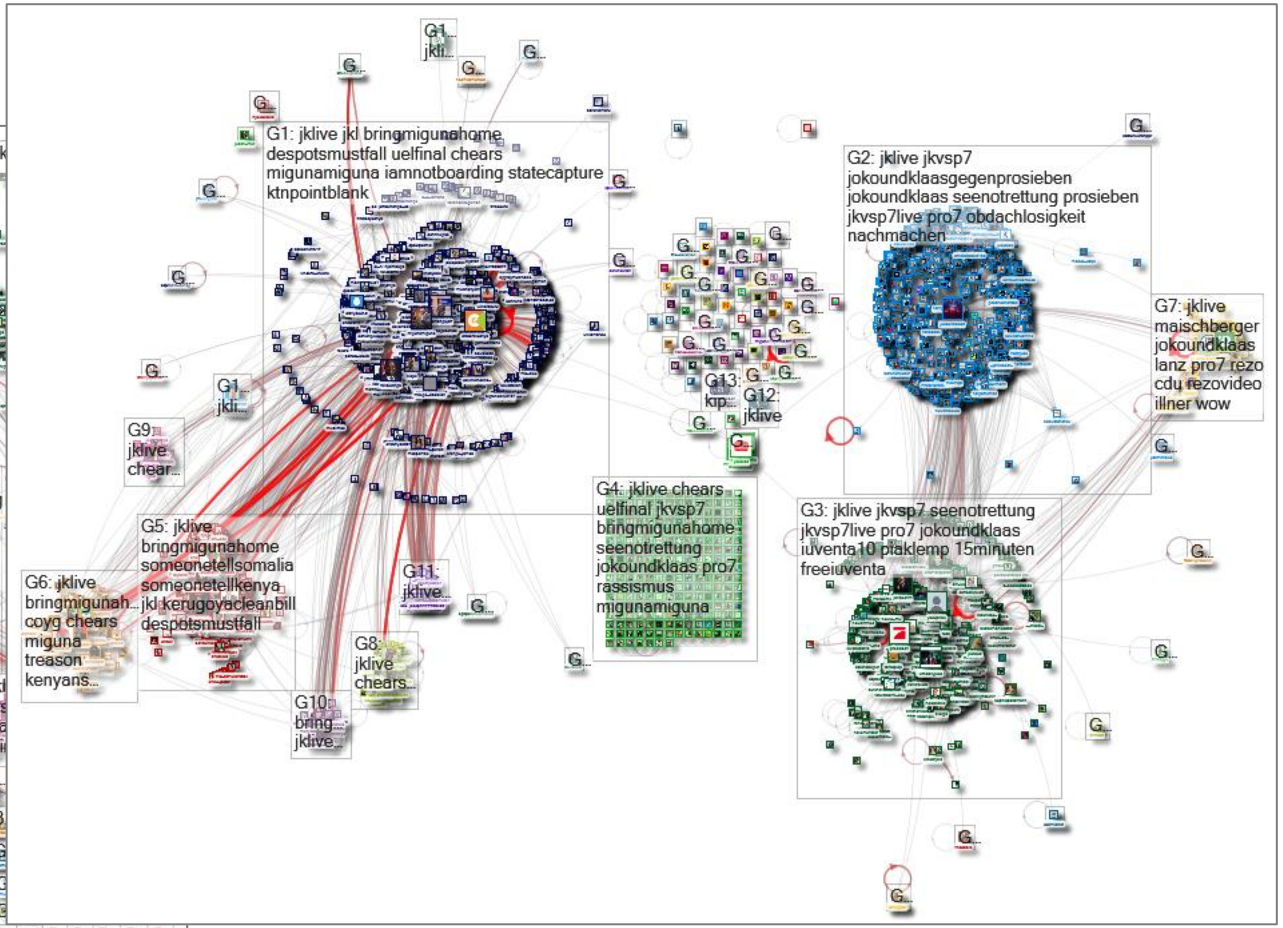


Group-In-A-Box Layout

Visual Analyis: Layout Options

Treemap layout



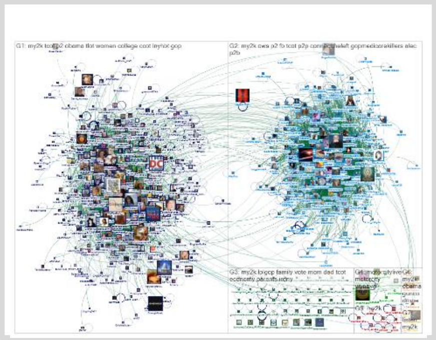


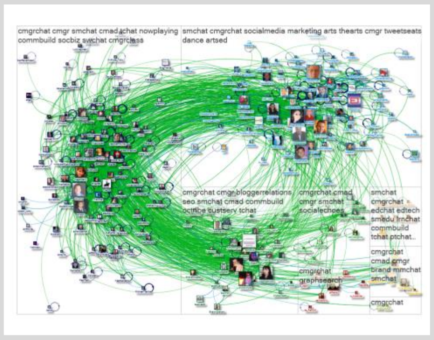
Force-directed layout

NETWORK SHAPES

1

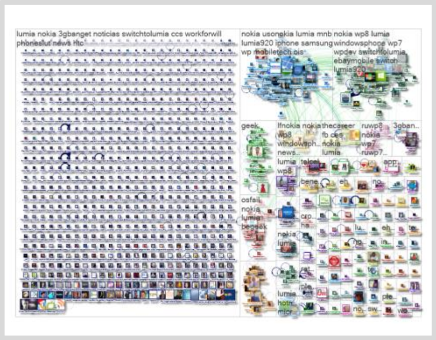
[Divided]
Polarized Crowds

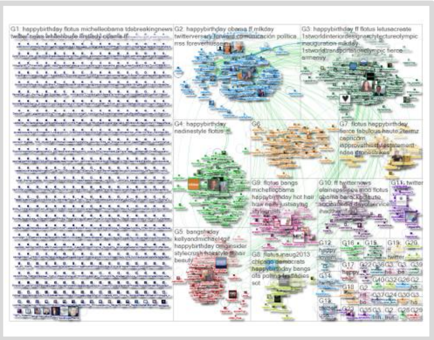




[Unified]
Tight Crowd

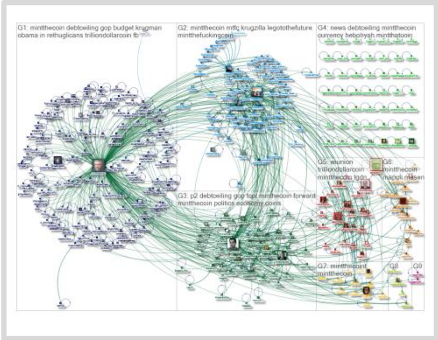
[Fragmented]
Brand Clusters

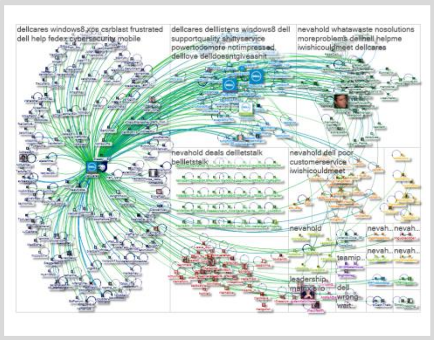




[Clustered]
Community Clusters

[In-Hub & Spoke]
Broadcast Network

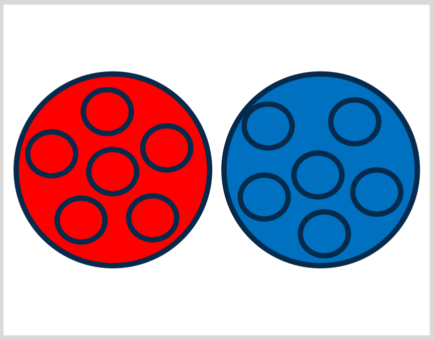


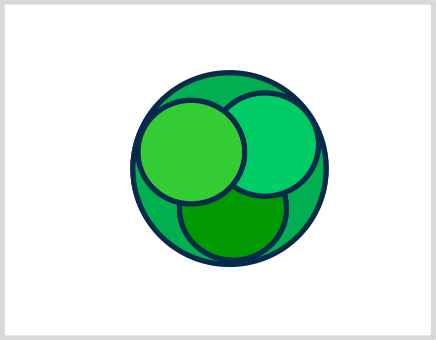


[Out-Hub & Spoke]
Support Network

SOCIAL MEDIA NETWORK SHAPES

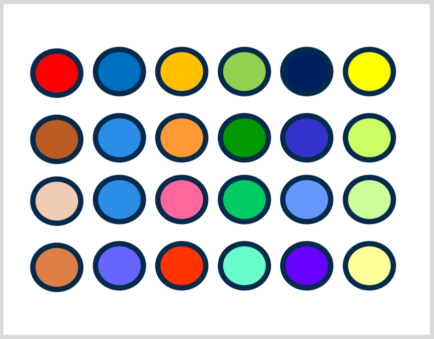
[Divided]
Polarized Crowds

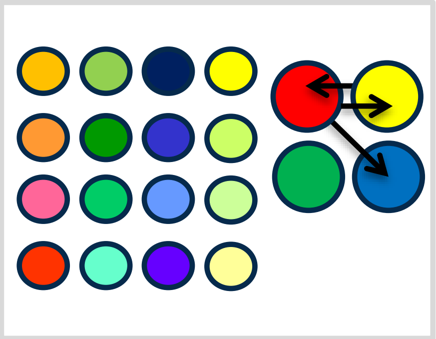




[Unified]
Tight Crowd

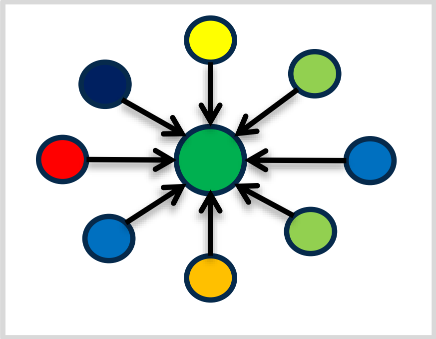
[Fragmented]
Brand Clusters

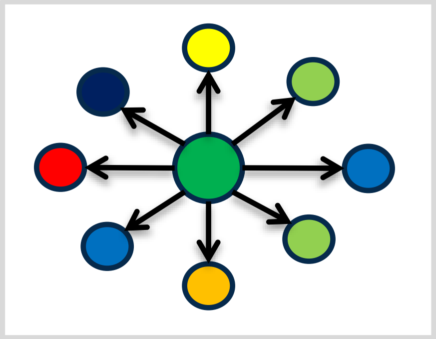




[Clustered]
Community Clusters

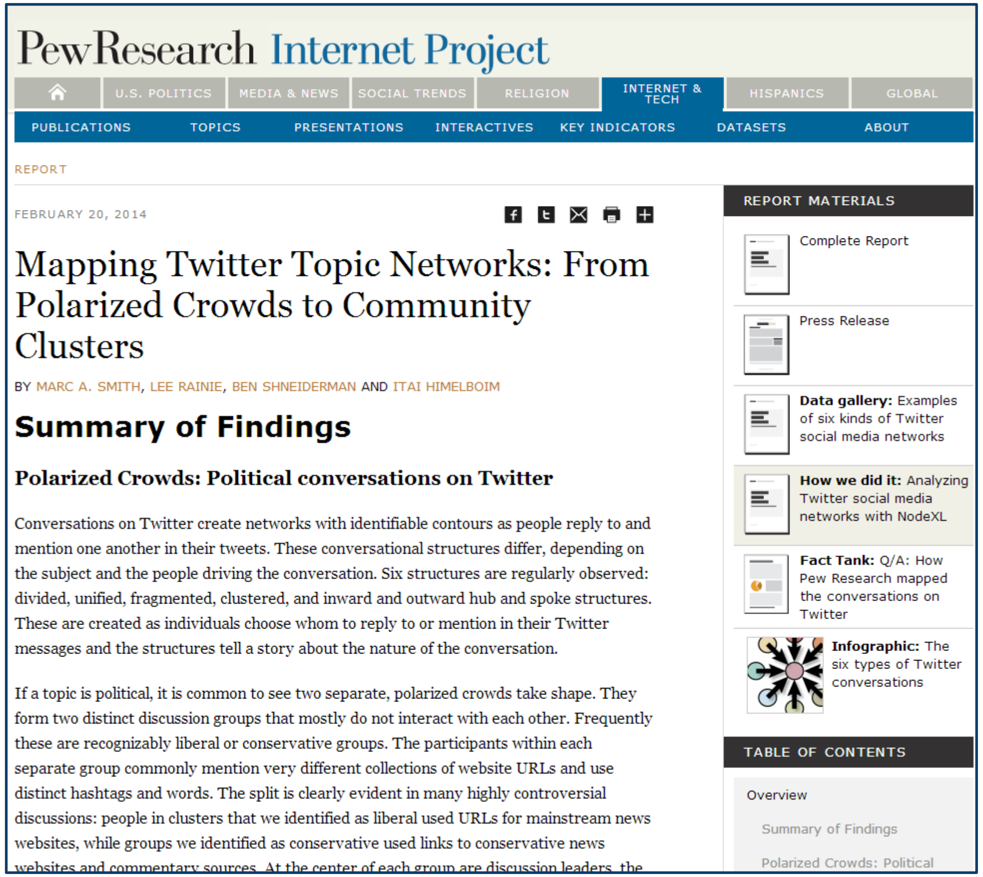
[In-Hub & Spoke]
Broadcast Network





[Out-Hub & Spoke]
Support Network

Social Media Network Shapes


PewResearch Internet Project

U.S. POLITICS | MEDIA & NEWS | SOCIAL TRENDS | RELIGION | INTERNET & TECH | HISPANICS | GLOBAL

PUBLICATIONS | TOPICS | PRESENTATIONS | INTERACTIVES | KEY INDICATORS | DATASETS | ABOUT

REPORT

FEBRUARY 20, 2014

Mapping Twitter Topic Networks: From Polarized Crowds to Community Clusters

BY MARC A. SMITH, LEE RAINIE, BEN SHNEIDERMAN AND ITAI HIMELBOIM

Summary of Findings

Polarized Crowds: Political conversations on Twitter

Conversations on Twitter create networks with identifiable contours as people reply to and mention one another in their tweets. These conversational structures differ, depending on the subject and the people driving the conversation. Six structures are regularly observed: divided, unified, fragmented, clustered, and inward and outward hub and spoke structures. These are created as individuals choose whom to reply to or mention in their Twitter messages and the structures tell a story about the nature of the conversation.

If a topic is political, it is common to see two separate, polarized crowds take shape. They form two distinct discussion groups that mostly do not interact with each other. Frequently these are recognizably liberal or conservative groups. The participants within each separate group commonly mention very different collections of website URLs and use distinct hashtags and words. The split is clearly evident in many highly controversial discussions: people in clusters that we identified as liberal used URLs for mainstream news websites, while groups we identified as conservative used links to conservative news websites and commentary sources. At the center of each group are discussion leaders, the

REPORT MATERIALS

Complete Report

Press Release

Data gallery: Examples of six kinds of Twitter social media networks

How we did it: Analyzing Twitter social media networks with NodeXL

Fact Tank: Q/A: How Pew Research mapped the conversations on Twitter

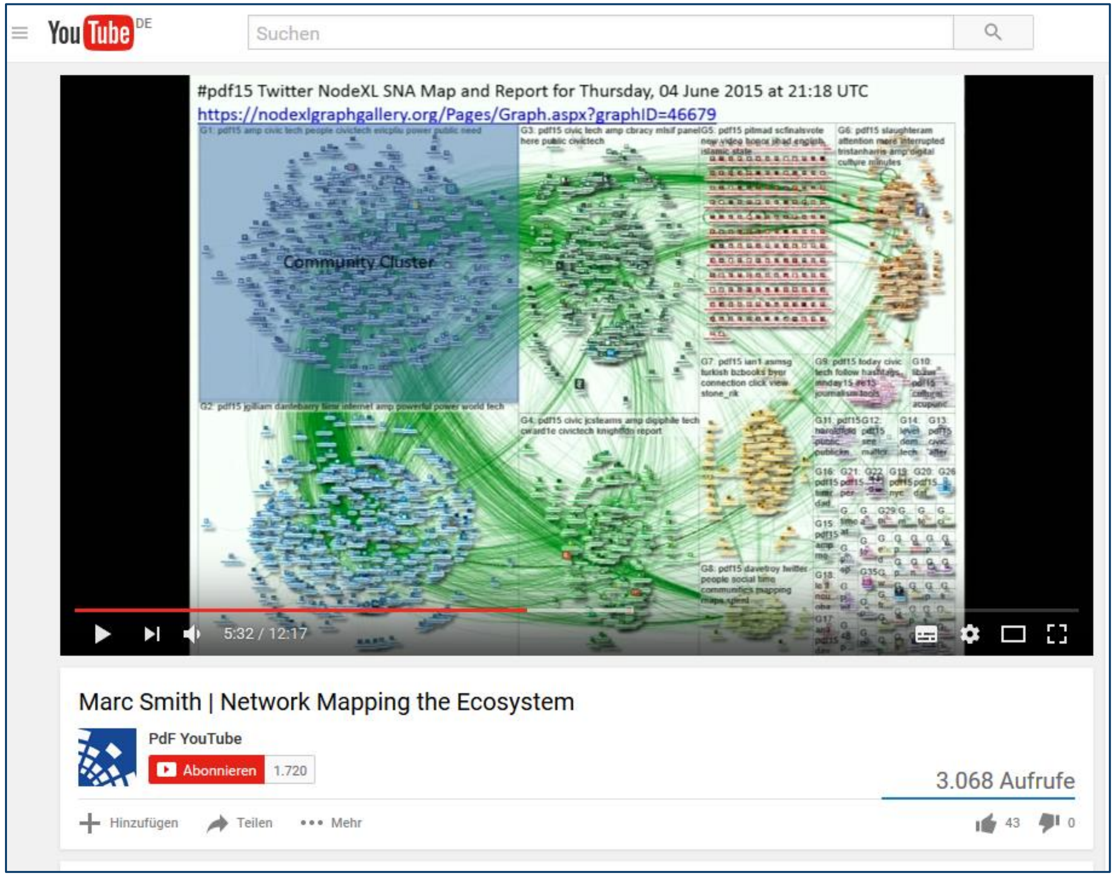
Infographic: The six types of Twitter conversations

TABLE OF CONTENTS

Overview

Summary of Findings

Polarized Crowds: Political



PEW Report: Mapping Twitter Topic Networks: From Polarized Crowds to Community Clusters. PEW Research Report 2014: http://www.pewinternet.org/2014/02/20/mapping-twitter-topic-networks-from-polarized-crowds-to-community-clusters/

Video: SMRF Director Marc Smith | Network Mapping the Ecosystem: https://www.youtube.com/watch?v=kDiGl-2m868

Youtube networks

Video network

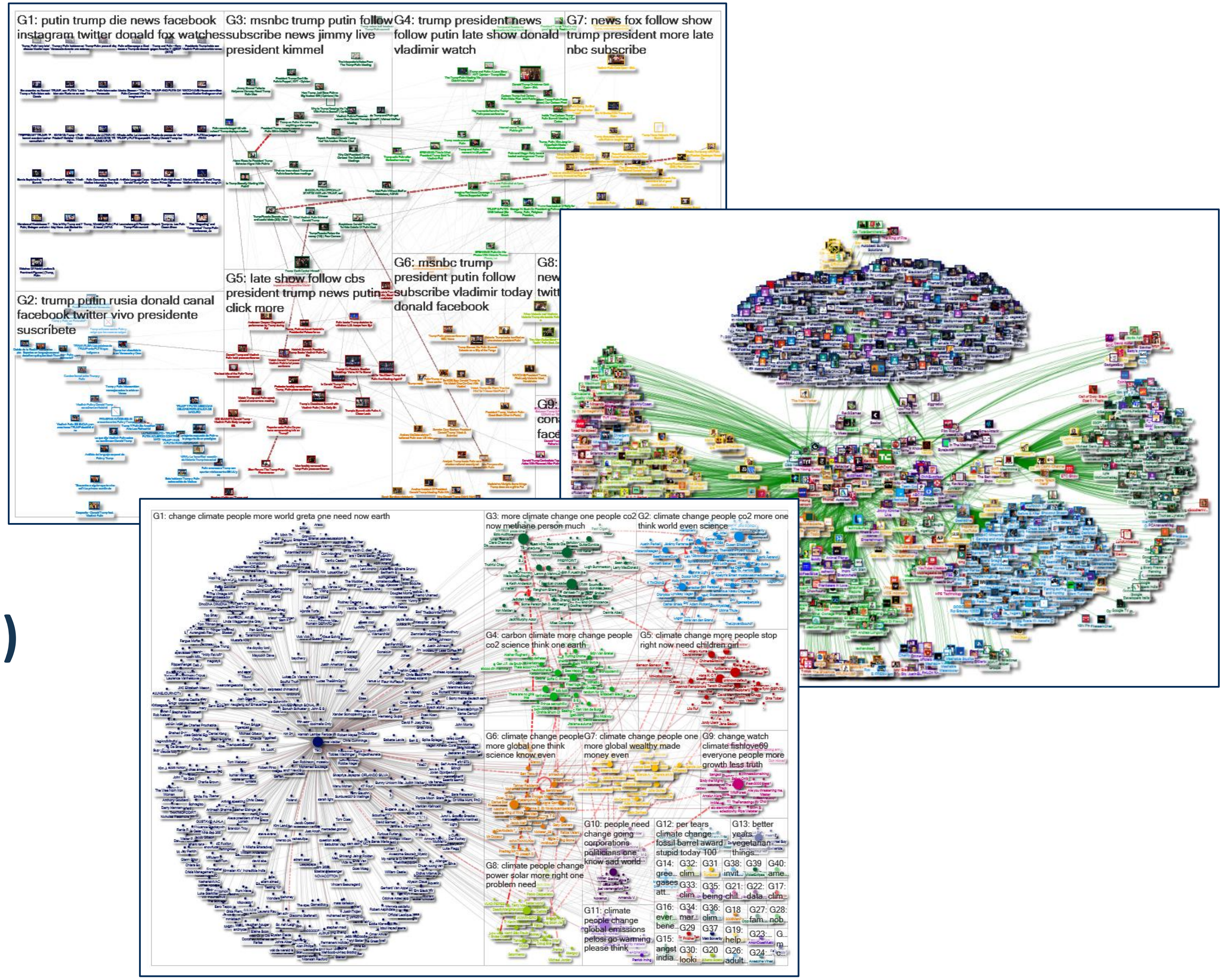
- Vertex: Video
- Edge creation: same commenter

User network

- Vertex: Youtube User
- Edge creation: subscribed to

User network (Netlytic data, DMI)

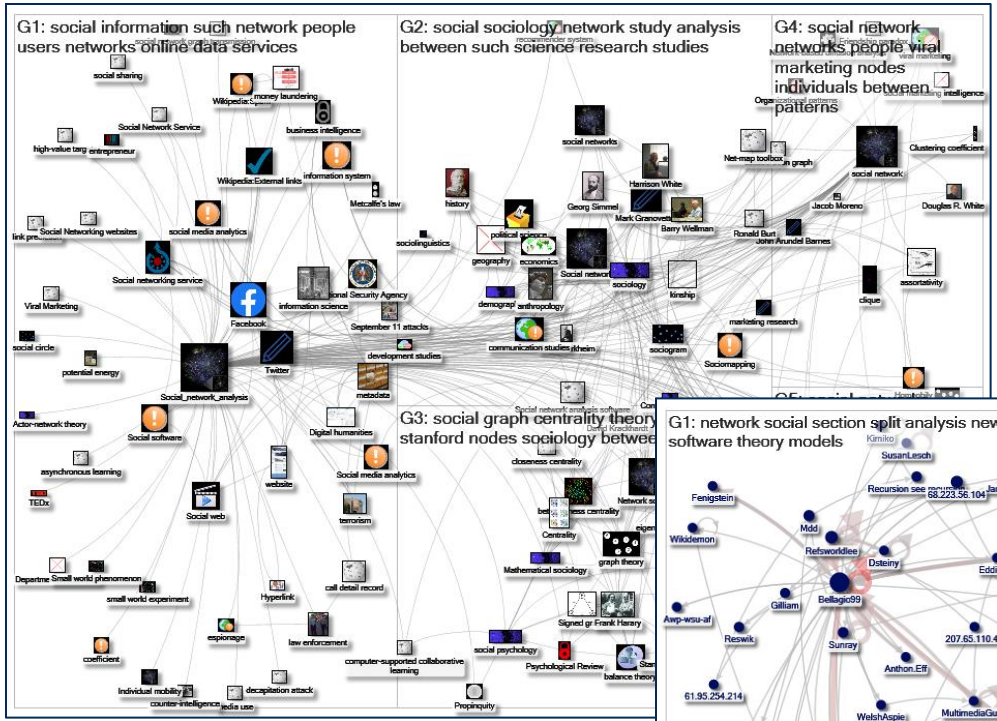
- Vertex: Youtube User
- Edge creation: comment, reply



WIKIPEDIA NETWORKS

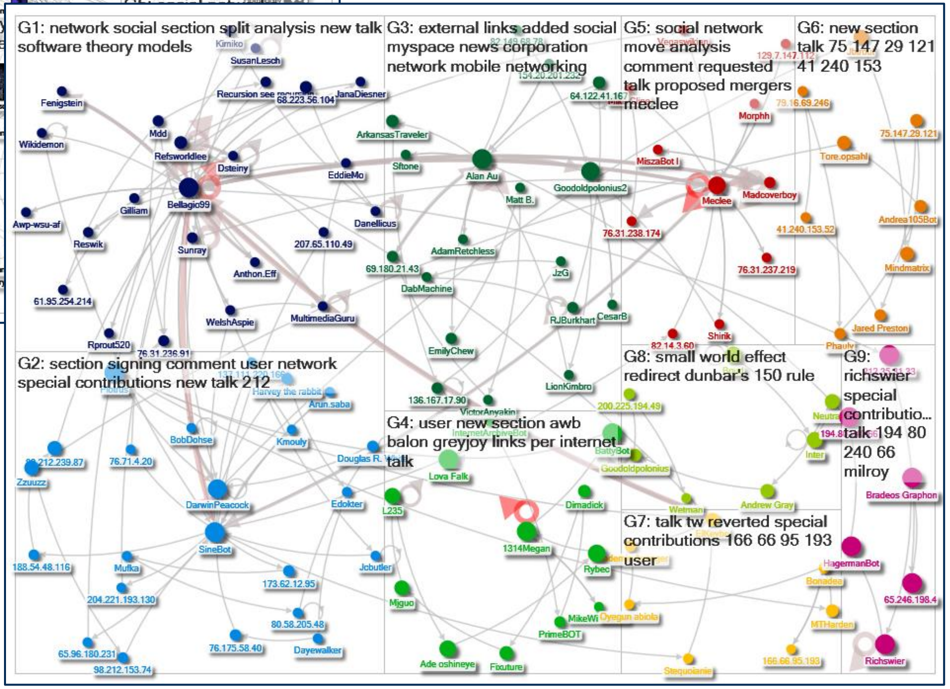
Page network

- Vertex: Page
- Edge creation: page link



User network

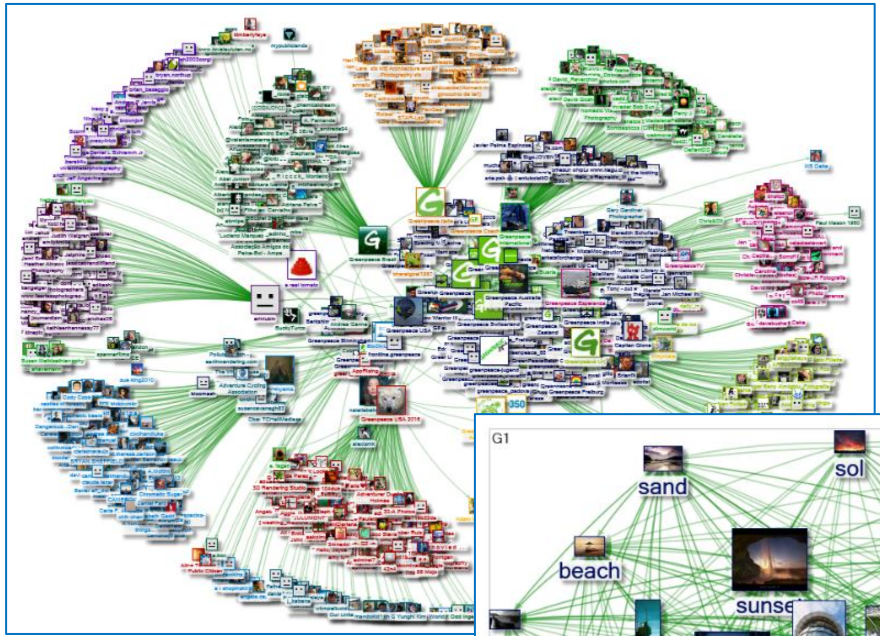
- Vertex: User
- Edge creation: Discussion, Coauthorship



FLICKR NETWORKS

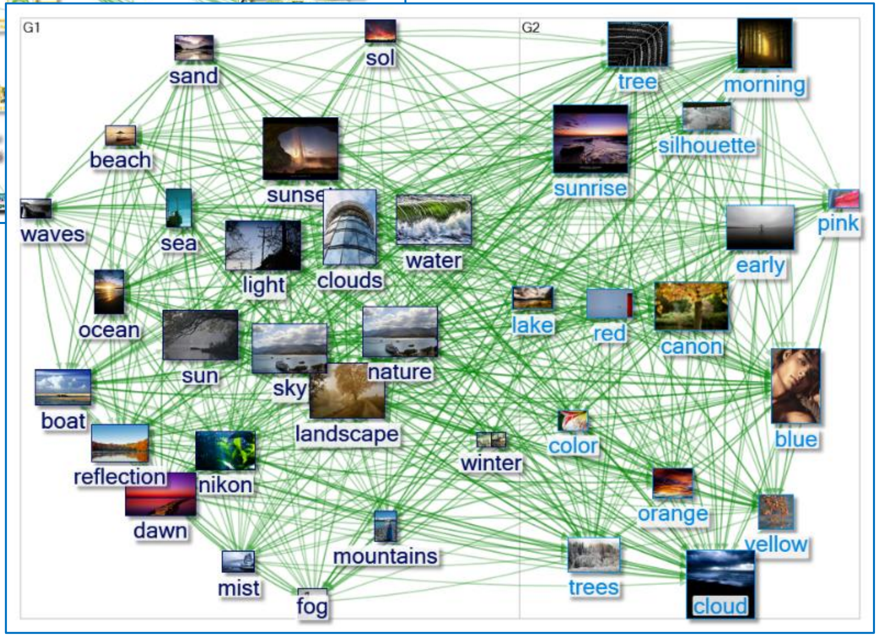
User network

- Vertex: Flickr User
- Edge creation: contact, comment



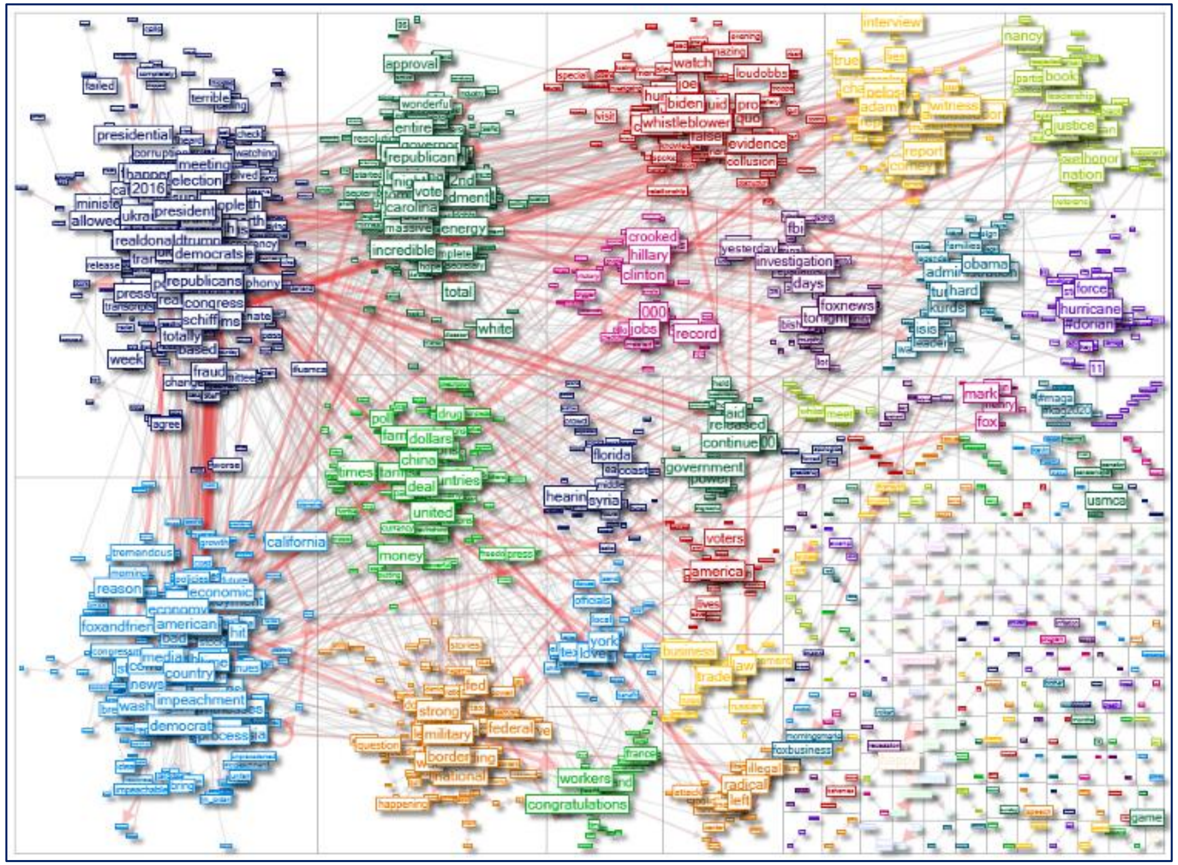
Related tags network

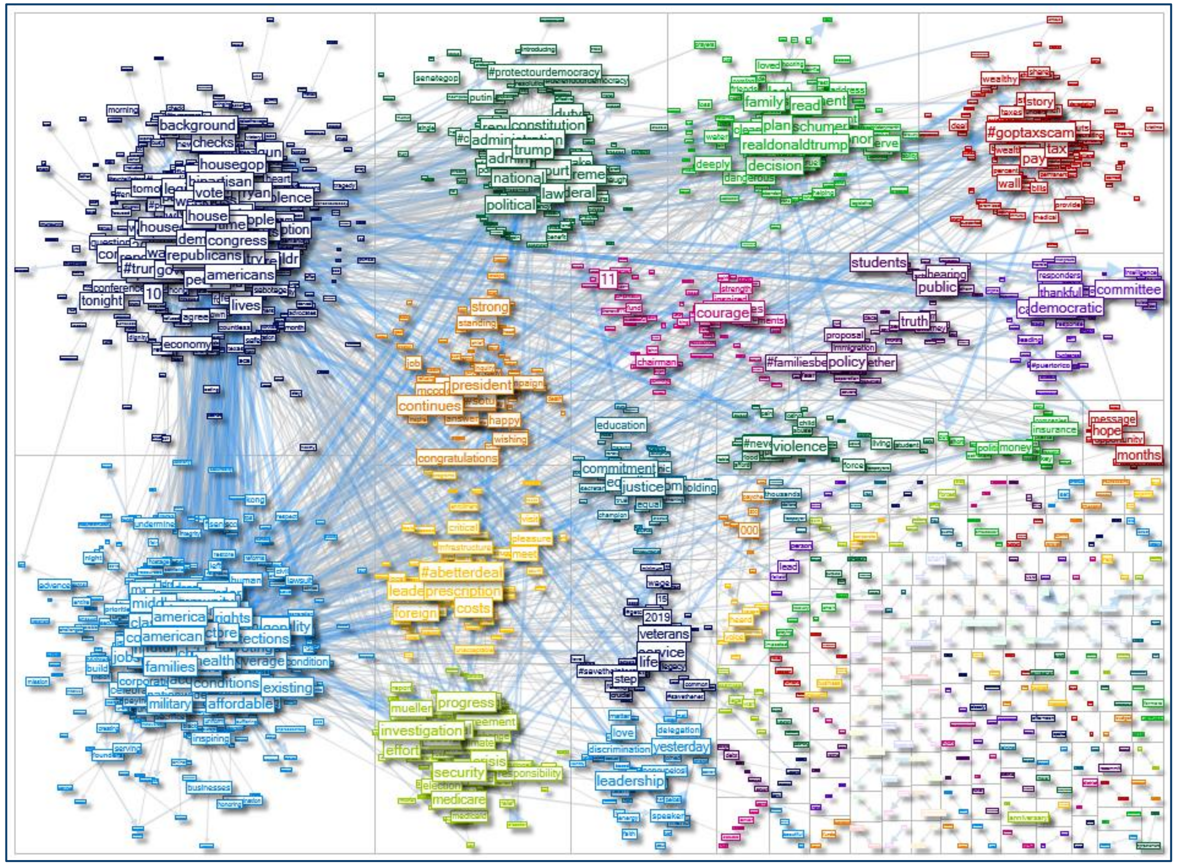
- Vertex: Photo tags
- Edge creation: co-mentions of tags



Semantic Networks

- Vertex: Hashtag / Word
- Edge creation: Co-mentions of hashtags / words in a tweet





Realdonaldtrump:
https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=217493

SpeakerPelosi:
https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=217499

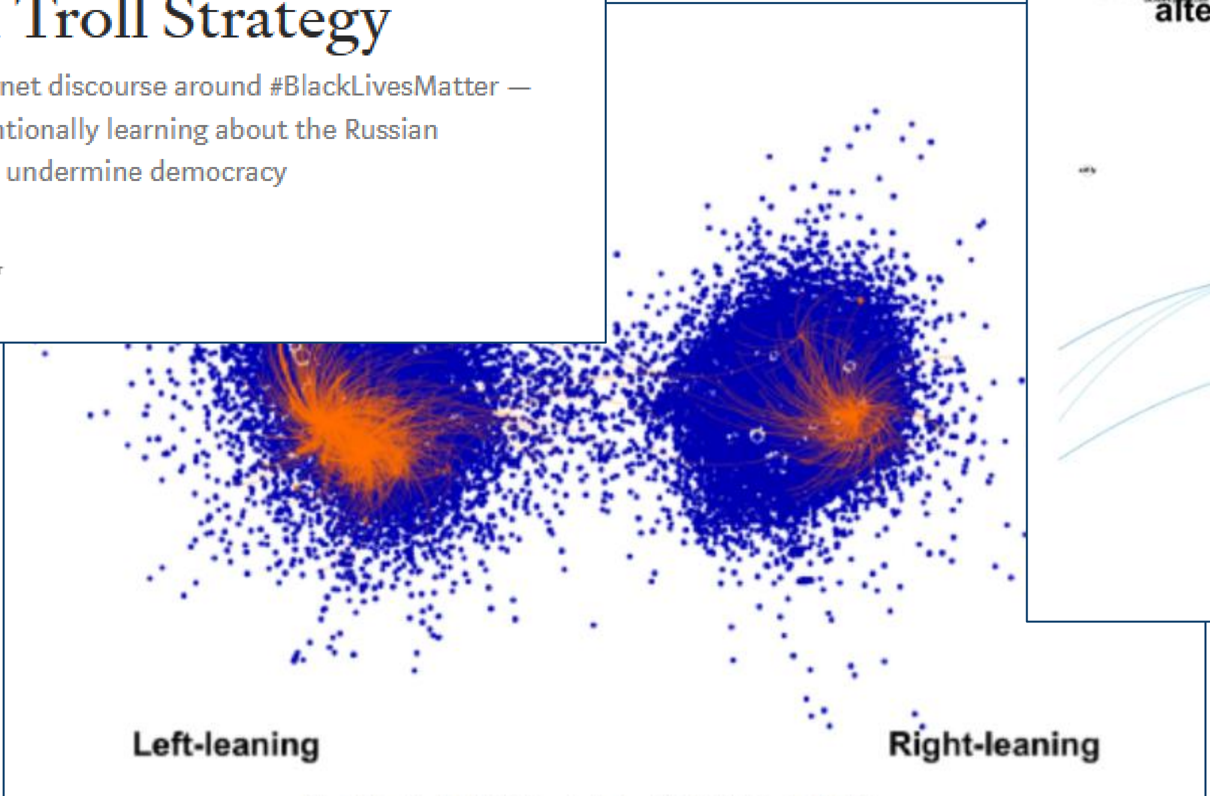
SNA AS INVESTIGATIVE TOOL

FEATURED STORIES

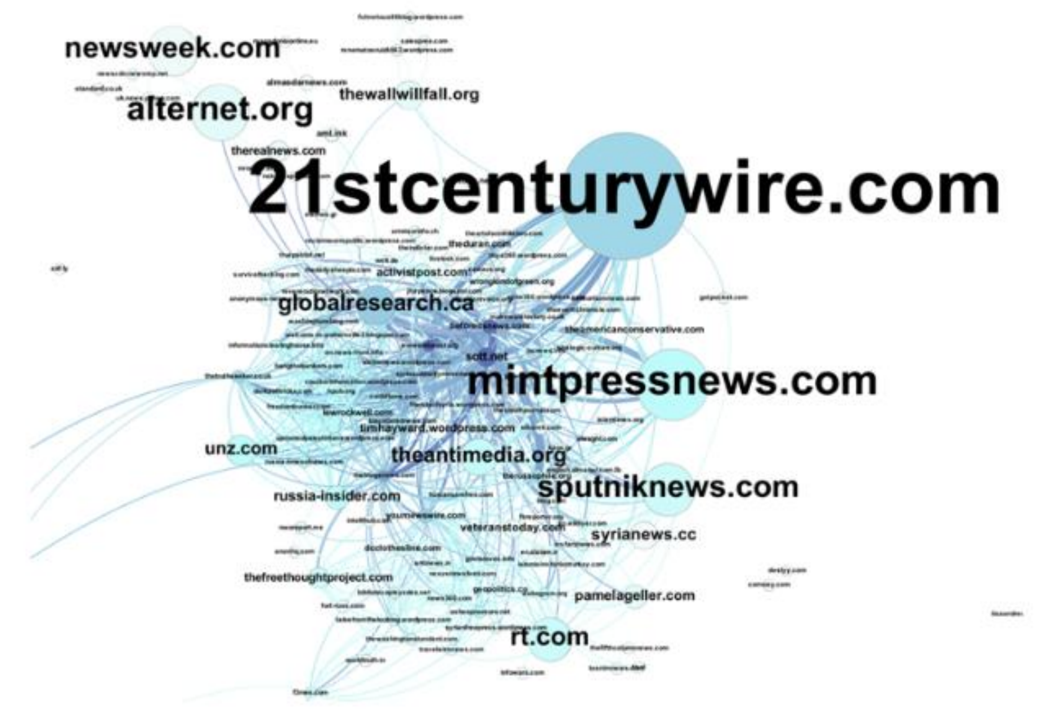
The Surprising Nuance Behind the Russian Troll Strategy

We set out to study internet discourse around #BlackLivesMatter — instead, we were unintentionally learning about the Russian information operation to undermine democracy

Kate Starbird Follow
Oct 20, 2018 · 10 min read

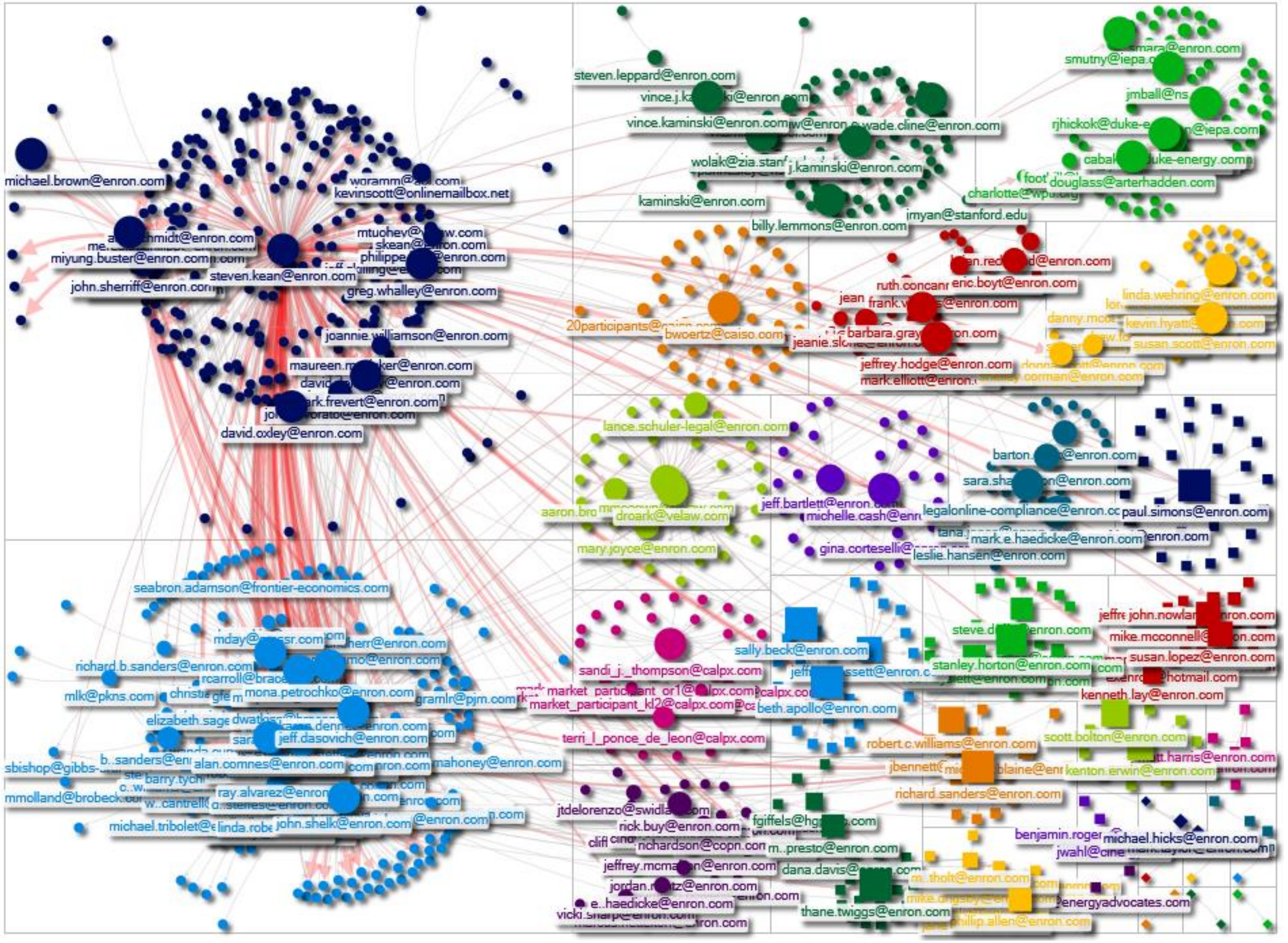


Retweet Network Graph plus IRA Troll Accounts. Courtesy of Kate Starbird/University of Washington



https://medium.com/s/story/the-trolls-within-how-russian-information-operations-infiltrated-online-communities-691fb969b9e4
https://faculty.washington.edu/kstarbi/StarbirdArifWilson_DisinformationasCollaborativeWork-CameraReady-Preprint.pdf

SNA AS INVESTIGATIVE TOOL



https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=210675

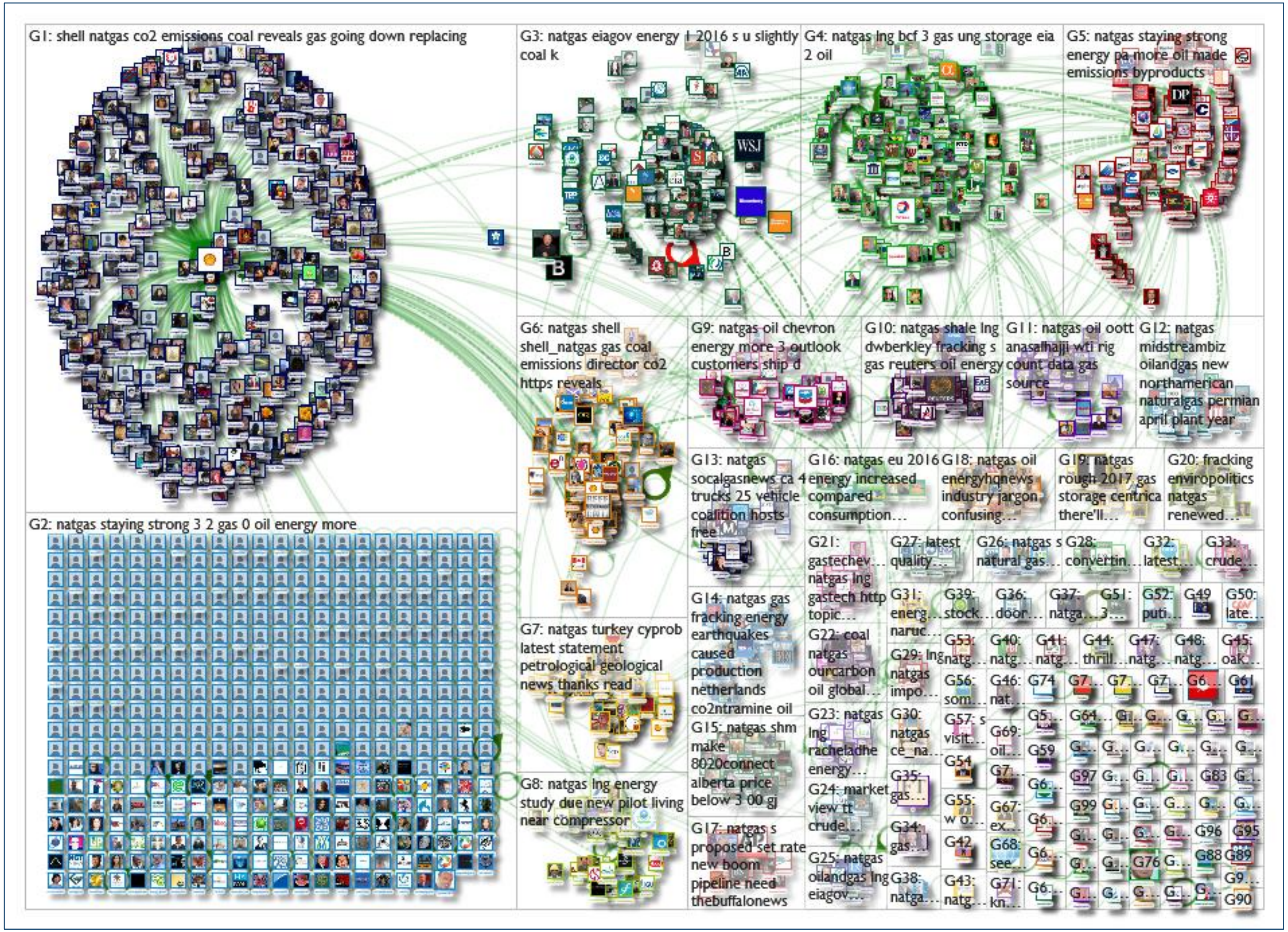
Enron Email Network

Donation Networks

Supply Chain Networks

…

Bot Network: Search Network #natgas



Bot Network: #Natgas User Network - internal

Top URLs

Top URLs in Tweet in Entire Graph:

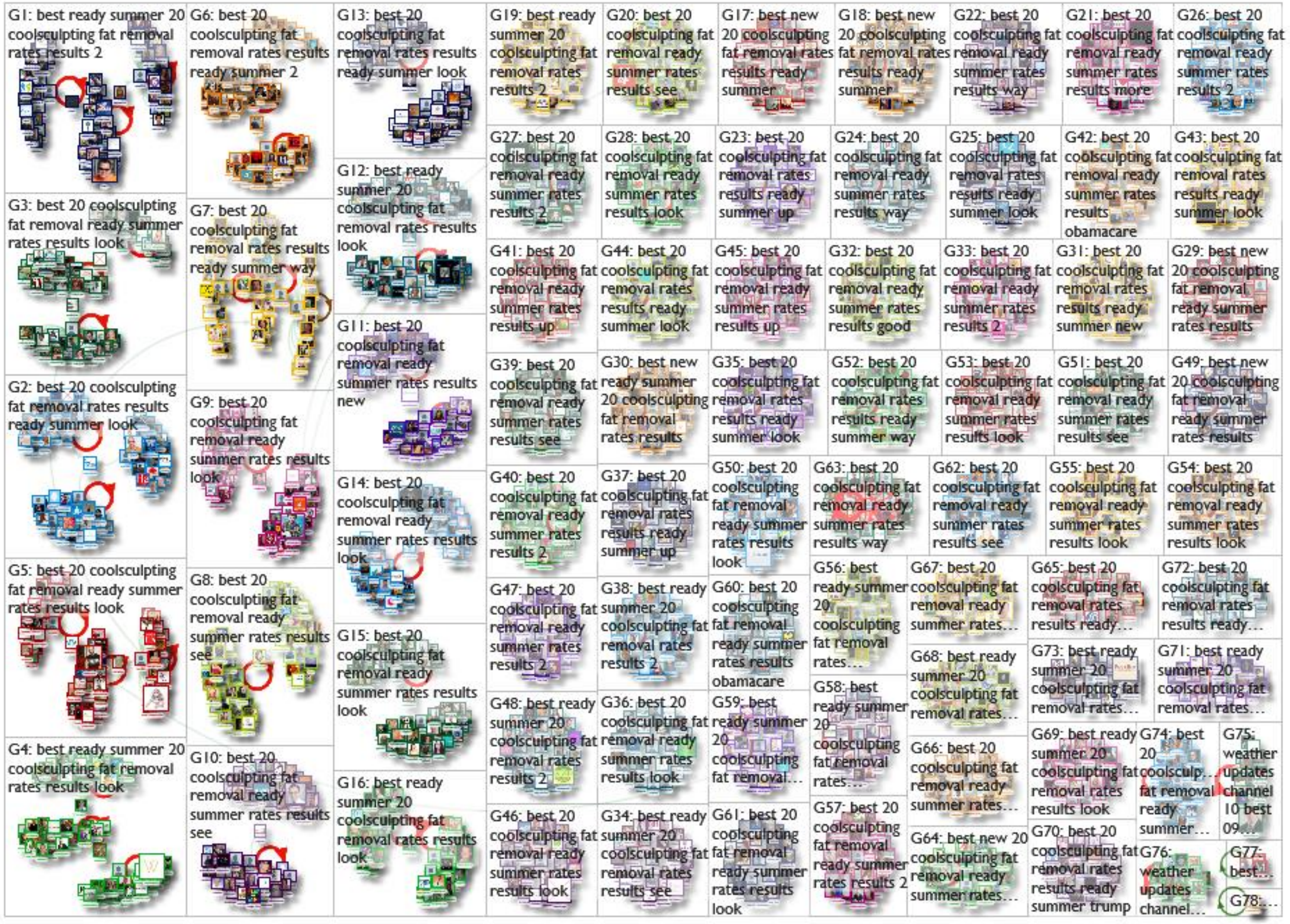
[452] http://uberdeal5.com/Doctor/
[233] http://bingomillionsforcharity.com/Doctor/
[224] http://bingobullion.com/Doctor/
[208] http://bingoangels.org/Doctor/
[135] http://toptweetdeals5.com/Doctor/
[128] http://uberdeal4.com/Doctor/
[113] http://uberdeal3.com/Doctor/
[81] http://uberdeal1.com/Doctor/
[79] http://tweet4topdeals2.com/Doctor/
[77] http://tweet4topdeals3.com/Doctor/

Top Hashtags

Top Hashtags in Tweet in Entire Graph:

[322] trump
[240] crudeoil
[212] natgas
[180] healthcare
[148] laborparticipation
[137] gdp
[135] samsung
[127] bryant
[122] spurs
[119] dow

Bot Network: #Natgas User Network



Top URLs

Top URLs in Tweet in Entire Graph:

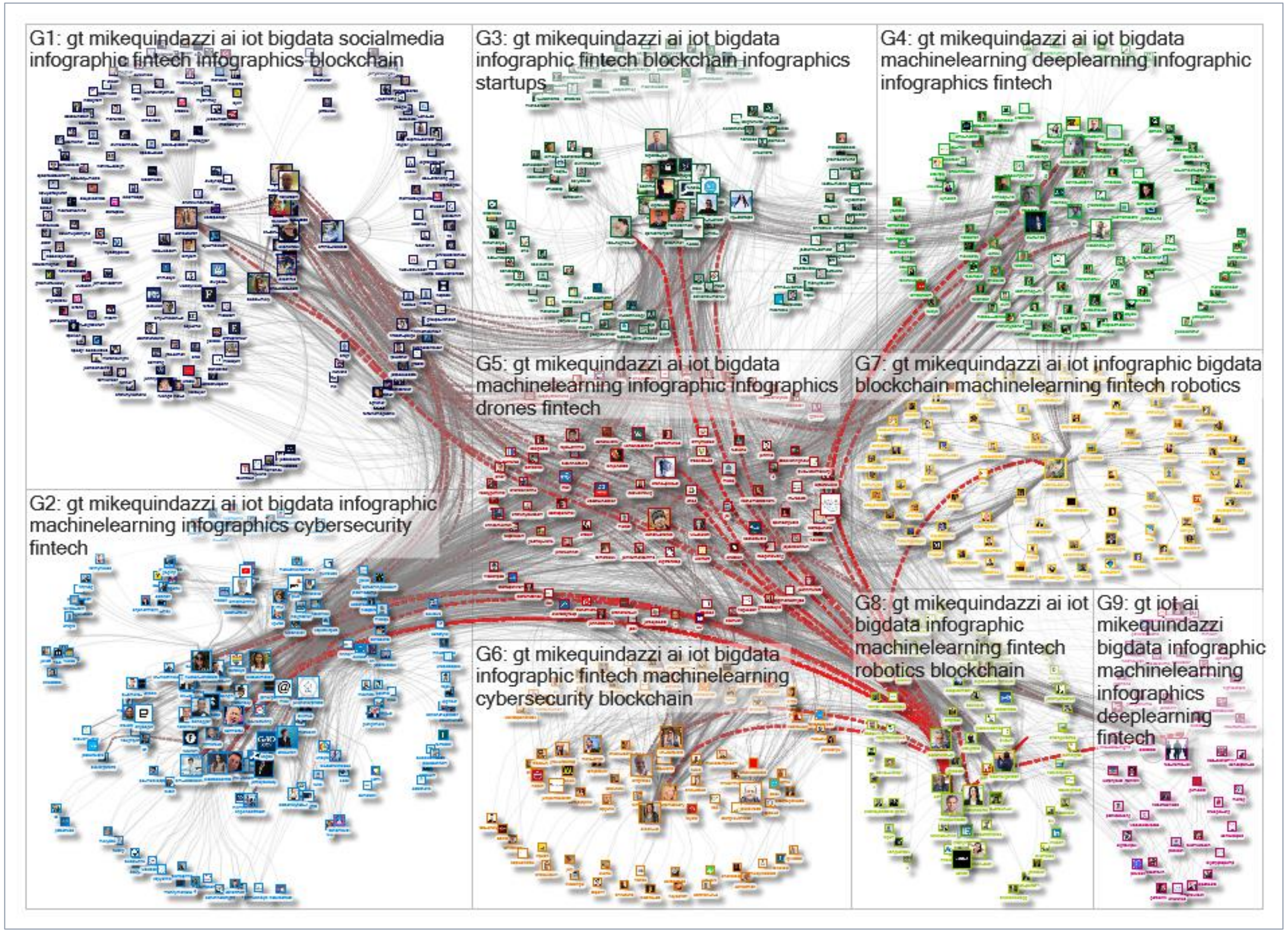
[452] http://uberdeal5.com/Doctor/
[233] http://bingomillionsforcharity.com/Doctor/
[224] http://bingobullion.com/Doctor/
[208] http://bingoangels.org/Doctor/
[135] http://toptweetdeals5.com/Doctor/
[128] http://uberdeal4.com/Doctor/
[113] http://uberdeal3.com/Doctor/
[81] http://uberdeal1.com/Doctor/
[79] http://tweet4topdeals2.com/Doctor/
[77] http://tweet4topdeals3.com/Doctor/

Top Hashtags

Top Hashtags in Tweet in Entire Graph:

[322] trump
[240] crudeoil
[212] natgas
[180] healthcare
[148] laborparticipation
[137] gdp
[135] samsung
[127] bryant
[122] spurs
[119] dow

Bot Network: NodeXL „6 types of“



Multimodal Networks: User - Media

▾ Top Hashtags

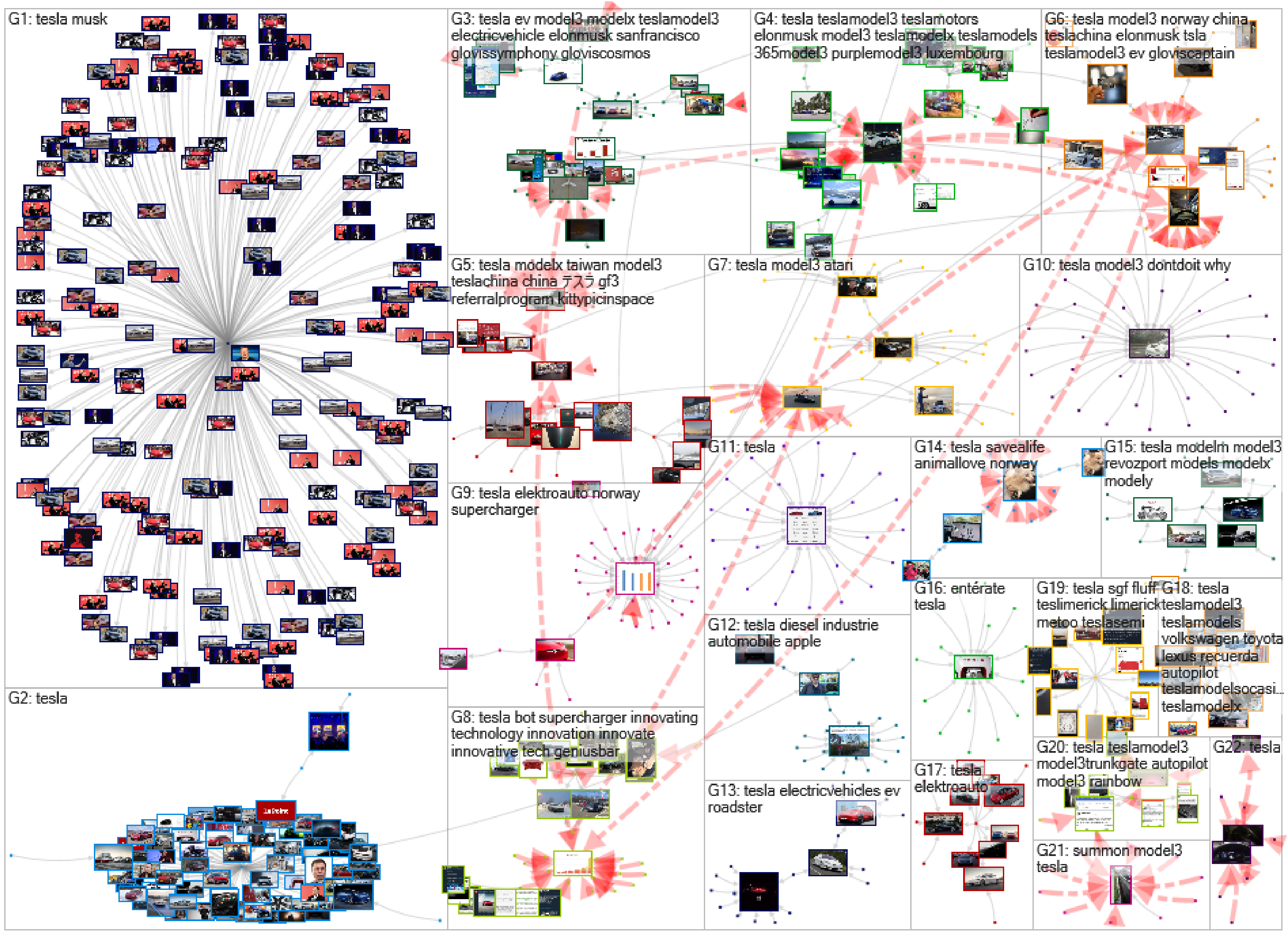
Top Hashtags in Tweet in Entire Graph:

[308] iot
[303] bigdata
[242] infographics
[242] internetofthings
[236] digitalmarketing
[236] datascience
[234] analytics
[234] datascientists
[234] socialnetworks
[232] rt

NodeXL types networks Twitter User-Image Network - treemap - grid layout 2019-02-07

https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=185727

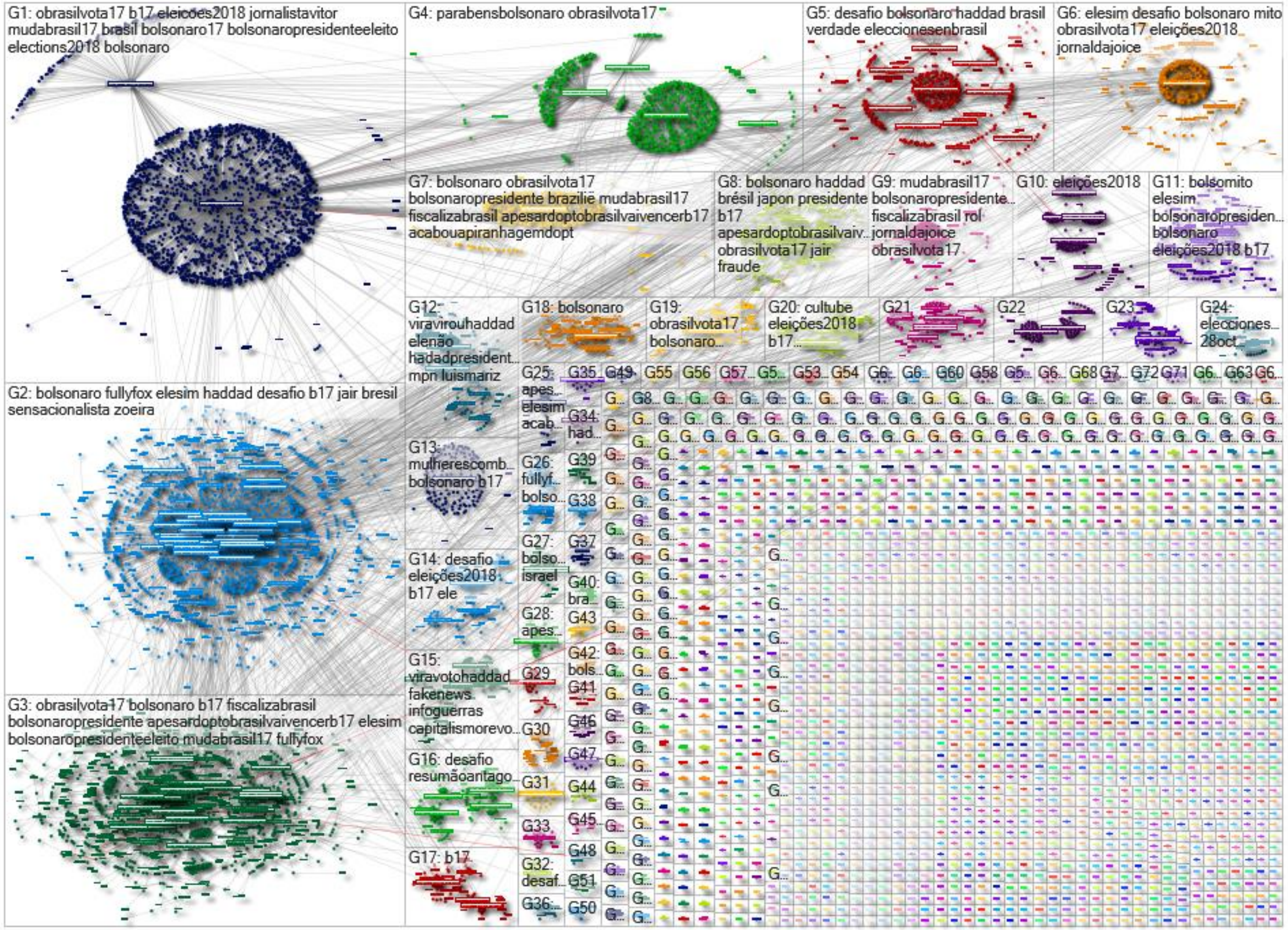
MULTIMODAL NETWORKS: USER - MEDIA



#Tesla Twitter User-to-Media File Network G1-G22 Monday, 04 February 2019

https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=185277

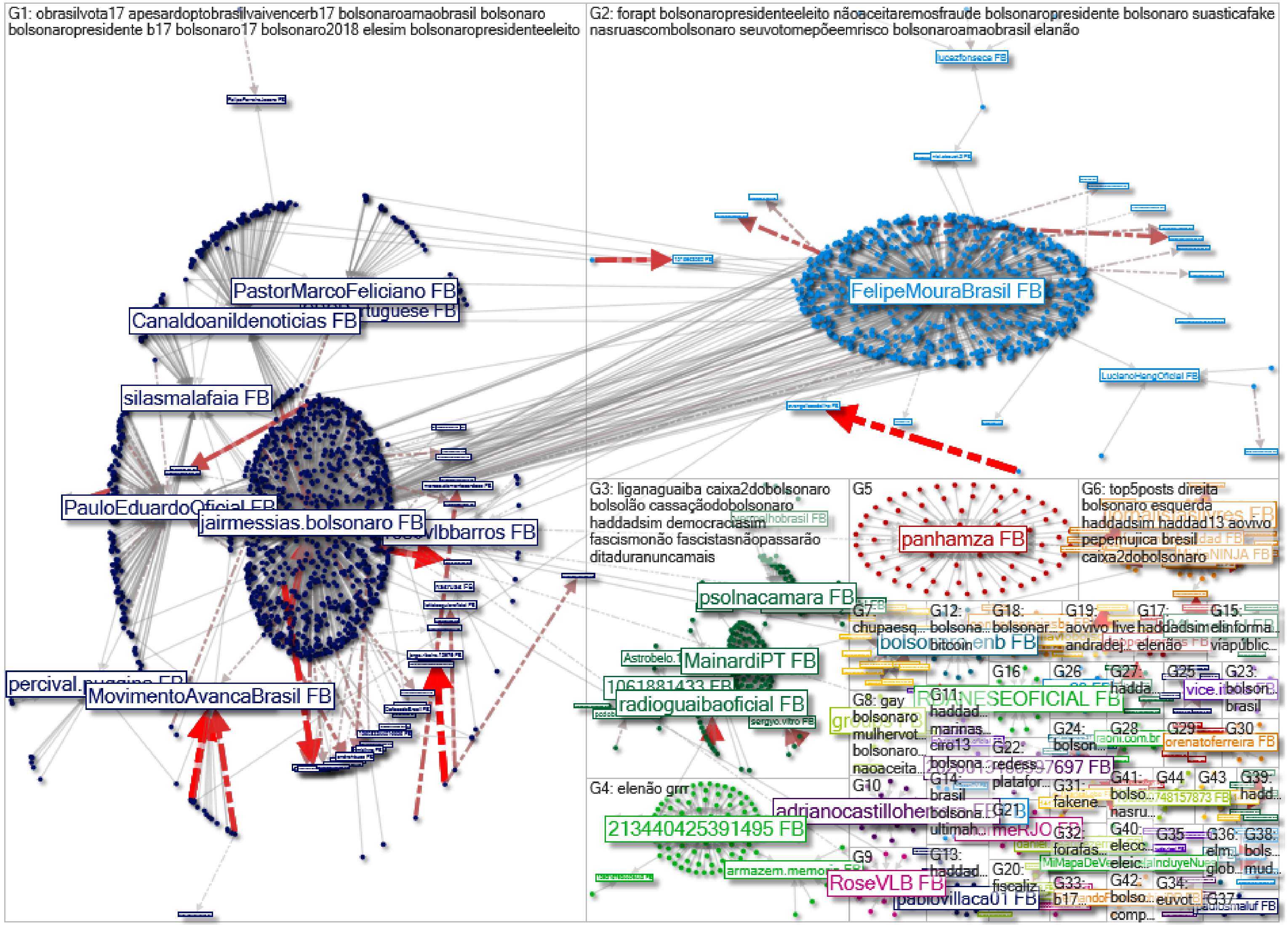
CROSS-PLATFORM ANALYSIS: TWITTER-YOUTUBE



Bolsonaro (youtube OR youtube.com OR youtu.be) user-url network until:2018-10-28

https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=185579

Cross-Platform Analysis: Twitter-Facebook



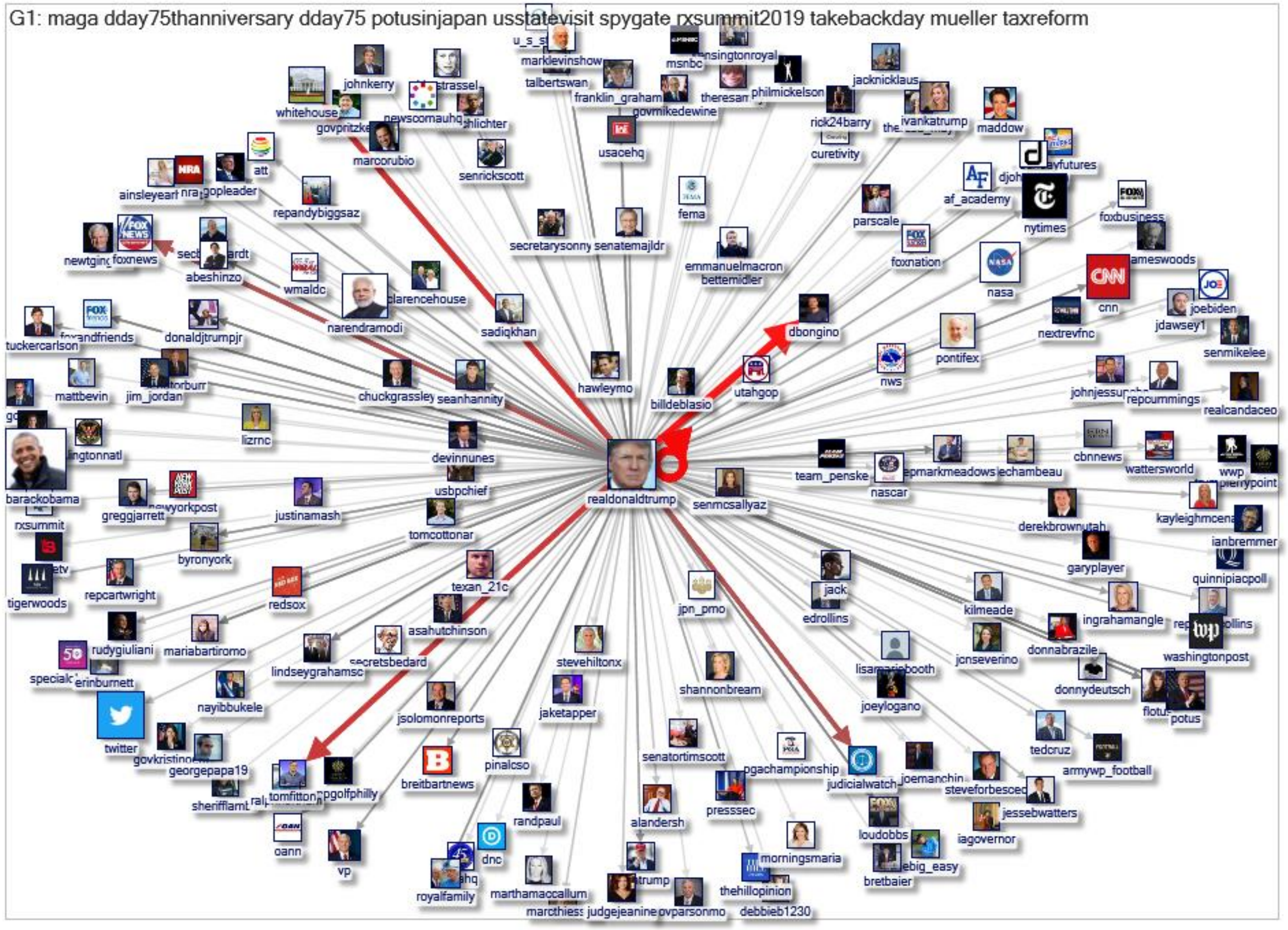
Bolsonaro (facebook.com OR fb.com OR fb.me) until:2018-10-22

https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=185533

User Account Investigation

https://theguardiansofdemocracy.com/trump-schedules-last-minute-meetings-based-whatever-saw-fox-friends-report/
https://www.vanityfair.com/news/2017/06/trump-says-he-wont-stop-tweeting

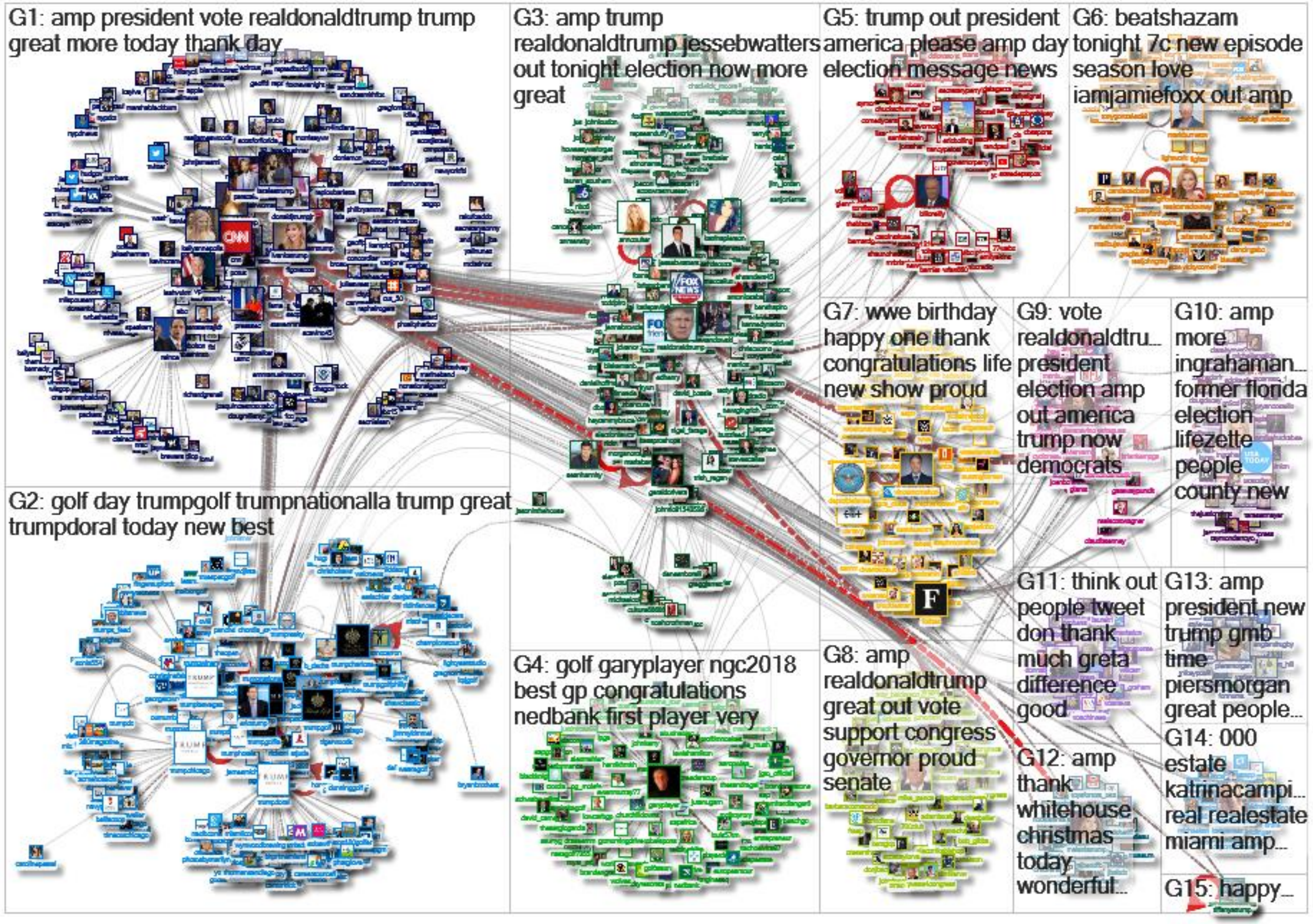
EXAMPLE: USER ACCOUNT ANALYSIS



realdonaldtrump Userlist 1000 2019-06-09

https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=199512

EXAMPLE: USER ACCOUNT ANALYSIS

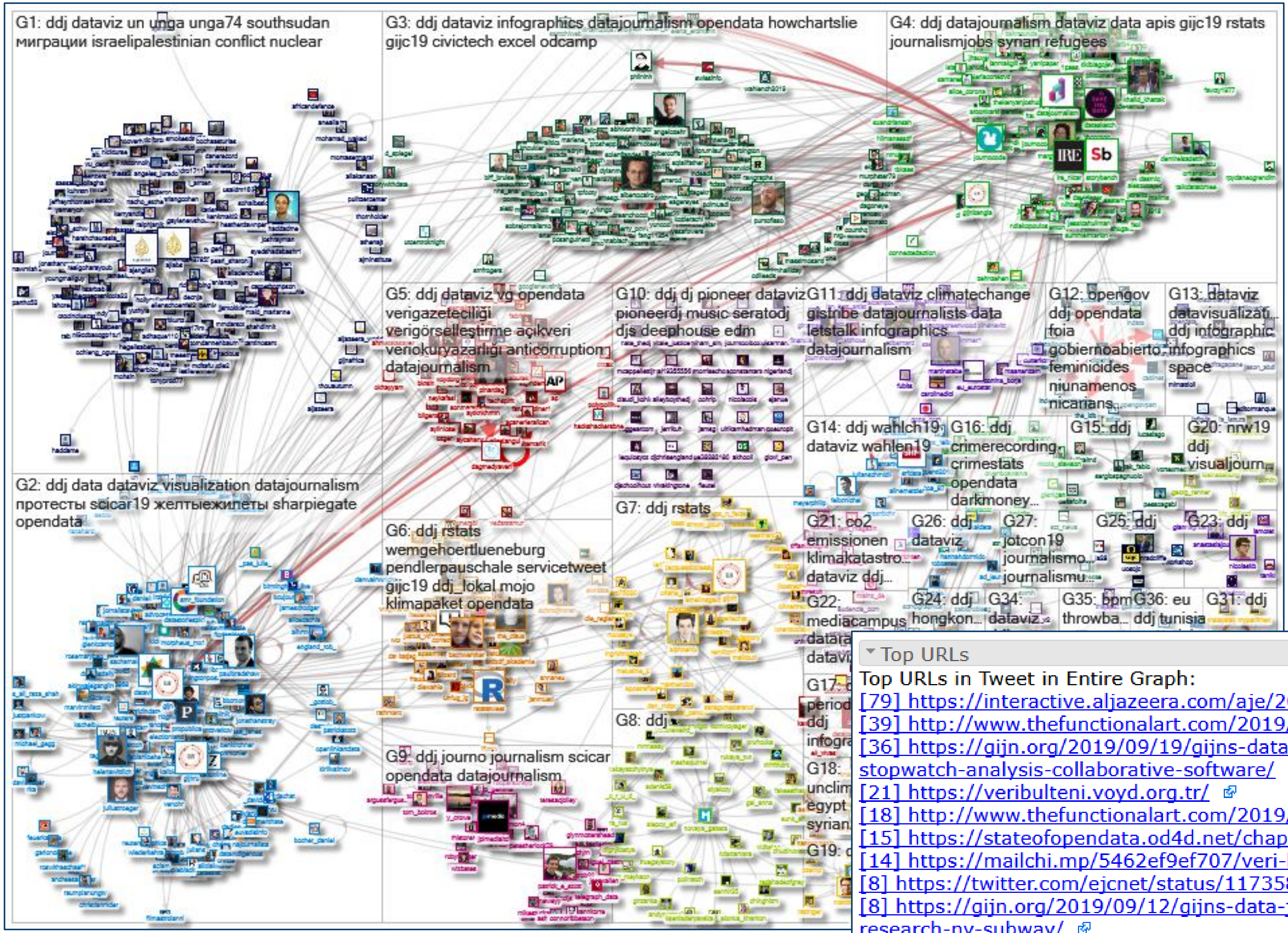


Based on Twitter users followed by @realdonaldtrump

https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=174922

Summarize and explore

Search term: #ddj



▾ Top Hashtags

Top Hashtags in Tweet in Entire Graph:

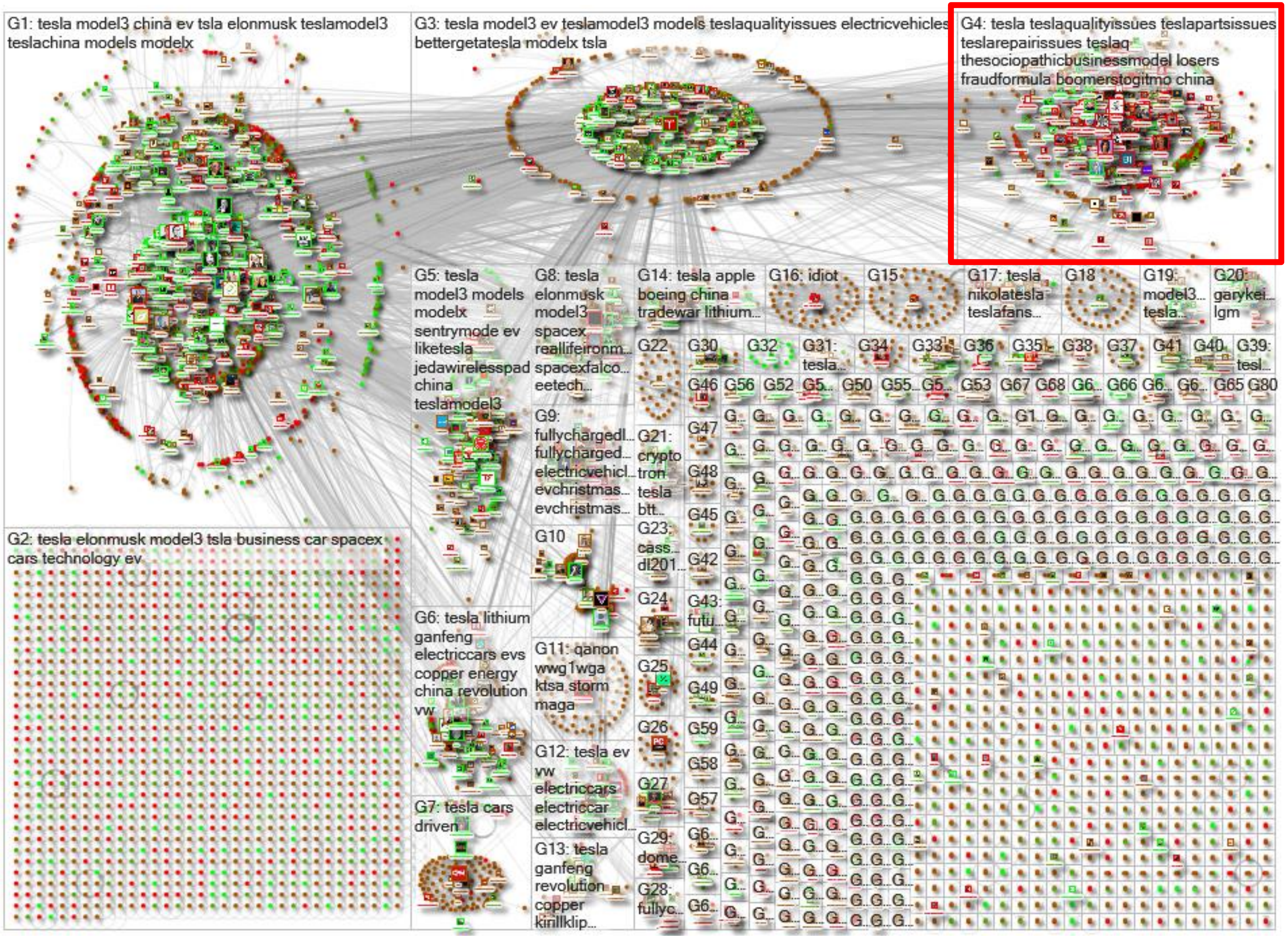
[602] ddj
[301] dataviz
[105] datajournalism
[74] infographics
[56] opendata
[47] vg
[32] data
[31] verigazeteciliği
[31] verigörselleştirme
[25] un

▾ Top URLs

Top URLs in Tweet in Entire Graph:

[79] https://interactive.aljazeera.com/aje/2019/how-has-my-country-voted-at-unga/index.html
[39] http://www.thefunctionalart.com/2019/09/new-data-journalism-and-visualization.html
[36] https://gijn.org/2019/09/19/gijns-data-journalism-top-10-plastic-mountains-sharpiegate-stopwatch-analysis-collaborative-software/
[21] https://veribulteni.voyd.org.tr/
[18] http://www.thefunctionalart.com/2019/09/how-to-build-data-narrative.html
[15] https://stateofopendata.od4d.net/chapters/sectors/accountability.html
[14] https://mailchi.mp/5462ef9ef707/veri-bulteni47
[8] https://twitter.com/ejcnet/status/1173587534745673734
[8] https://gijn.org/2019/09/12/gijns-data-journalism-top-10-3d-animation-brexit-borders-bad-research-ny-subway/
[6] https://wid.world/

#ddj Twitter NodeXL SNA Map and Report for Tuesday, 24 September 2019: https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=210841

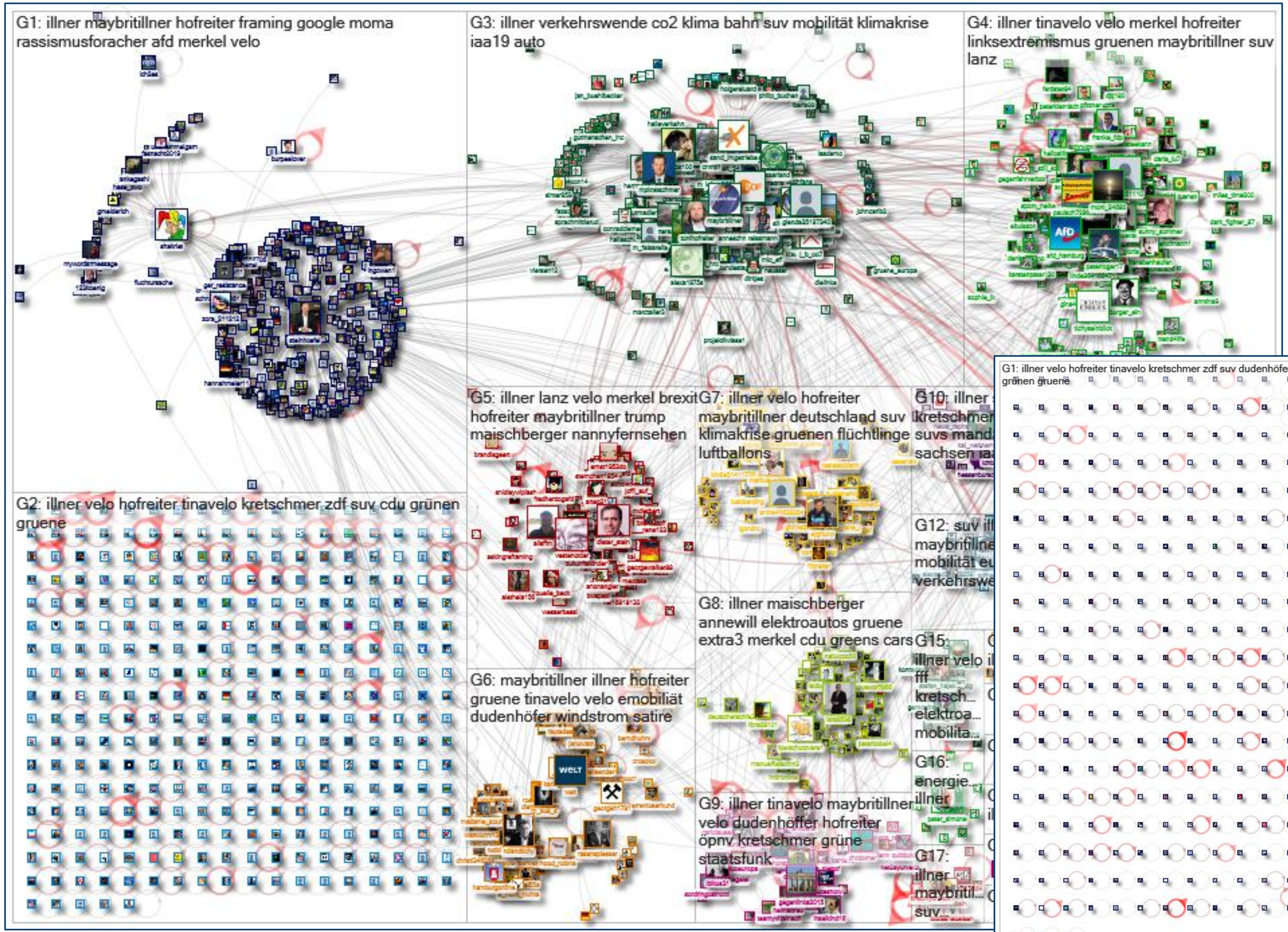


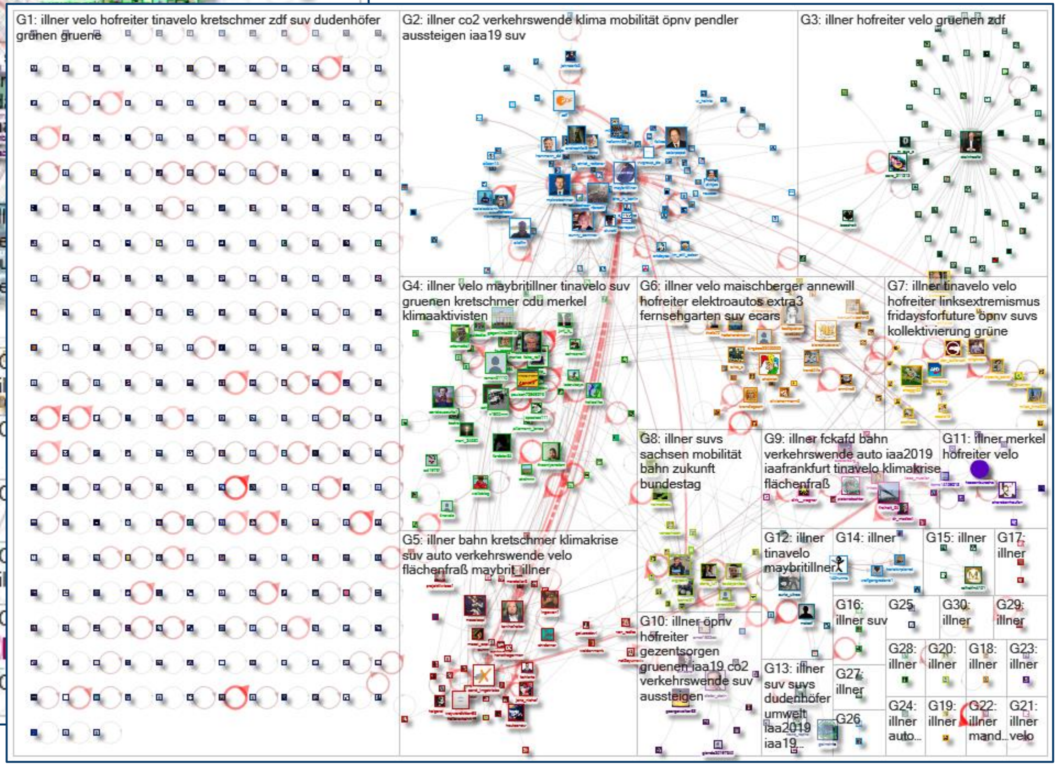
Visualizing Sentiment

Color by Language

Search term:
Tesla lang:en

Tesla lang:en Twitter NodeXL SNA Map and Report for Friday, 07 June 2019: https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=199387





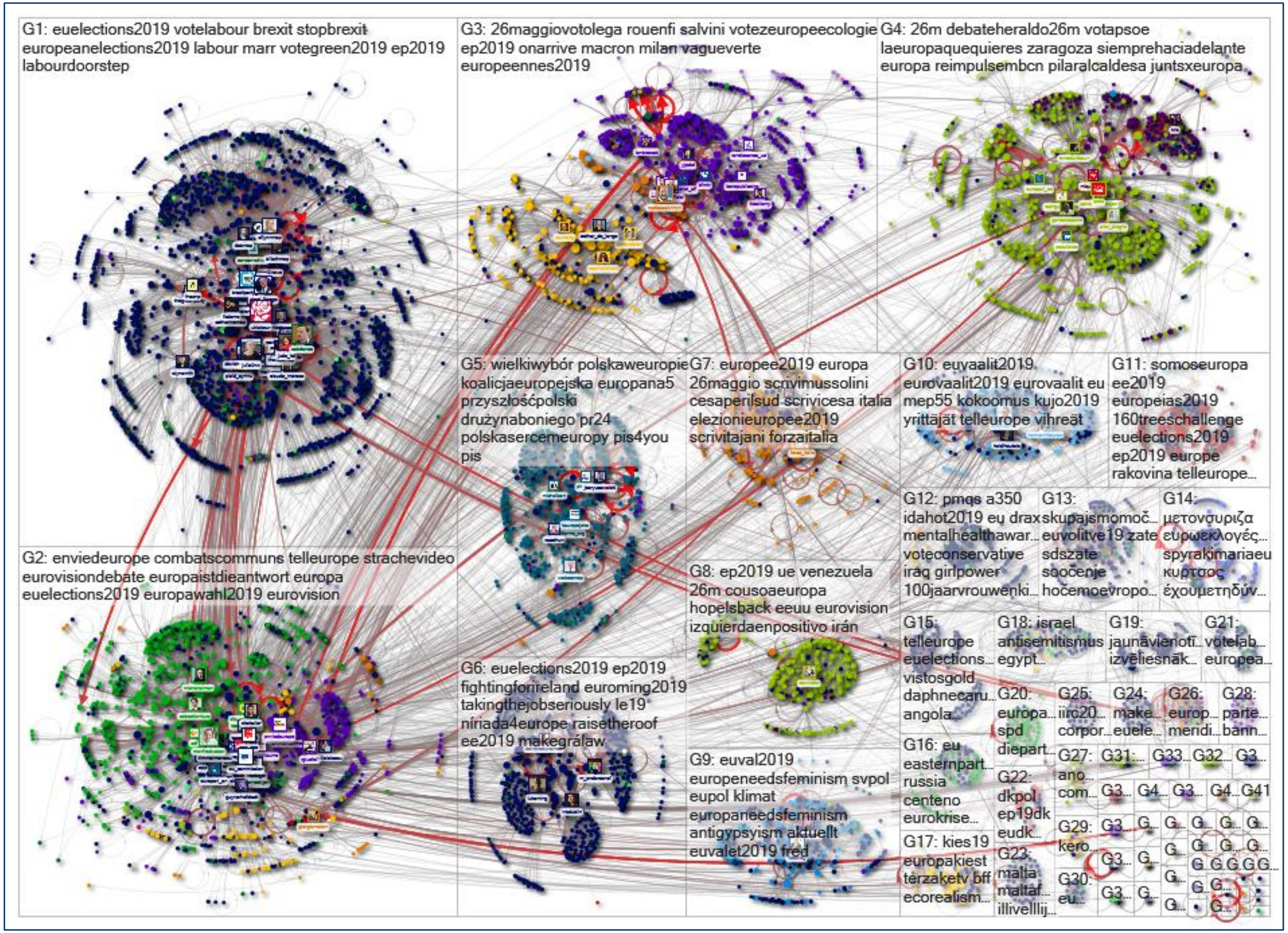
German Talkshow Illner

Sep-12-2019 - 22:15-23:15

Search term: Illner

- Before / after the show
- Live data

https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=209614 https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=209628



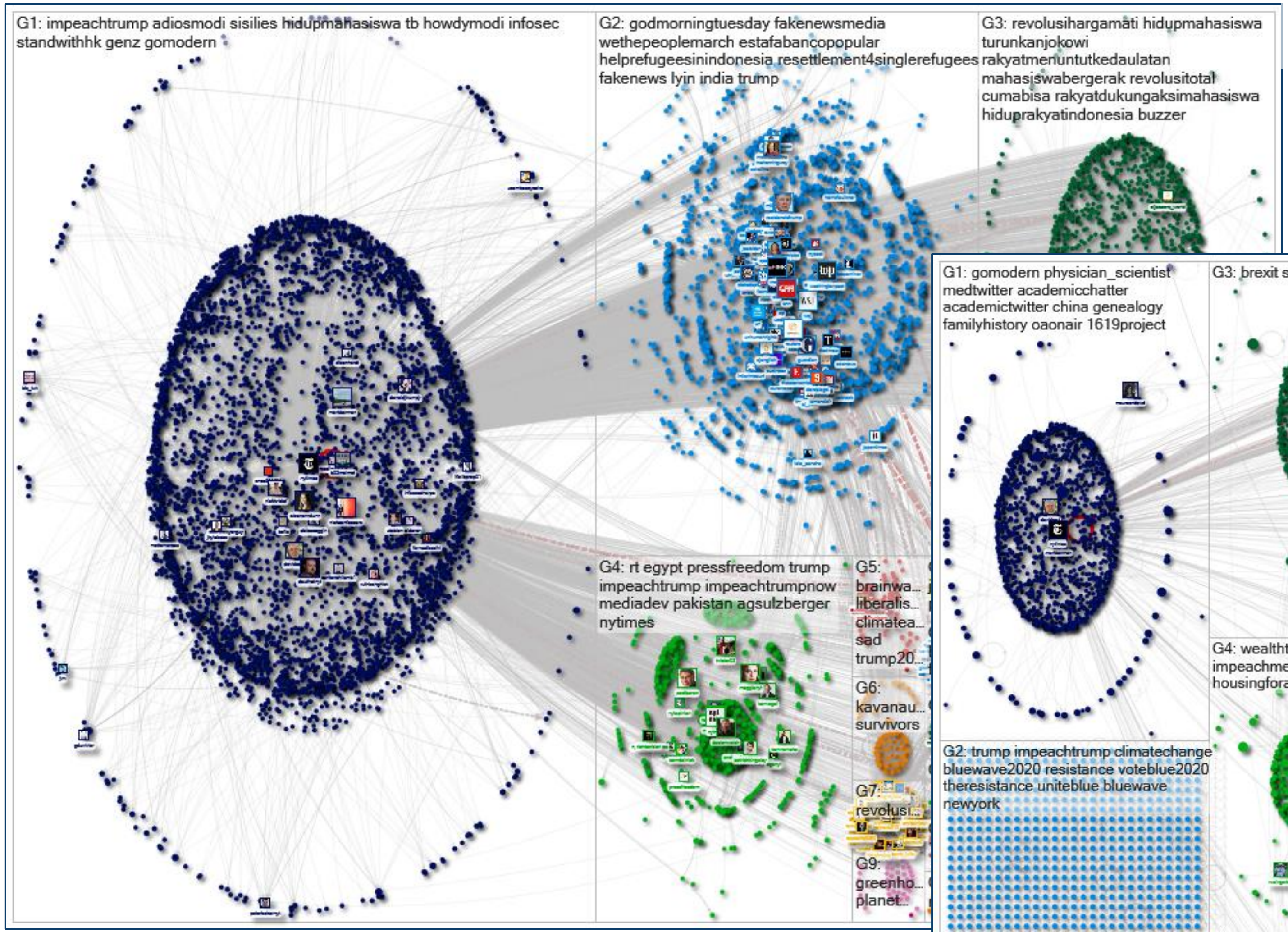
Members of the European Parliament before the European Elections 2019

Color by Language

Search term:
list:Europarl_EN/all-meps-on-twitter

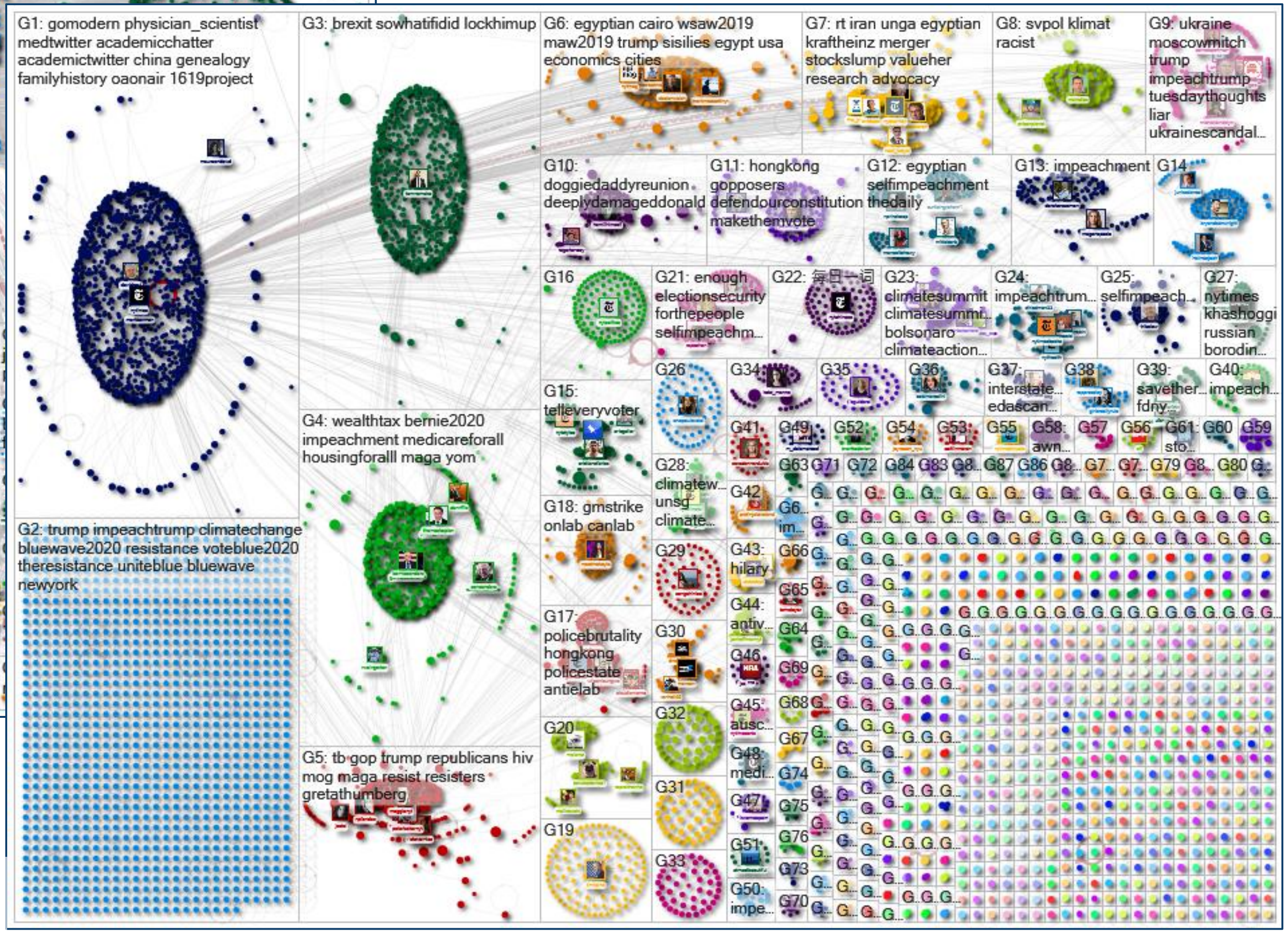
list:Europarl_EN/all-meps-on-twitter Monday, 20 May 2019: https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=197547

@nytimes Twitter NodeXL SNA Map and Report for Tuesday, 24 September 2019: https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=210833



Search term: @nytimes

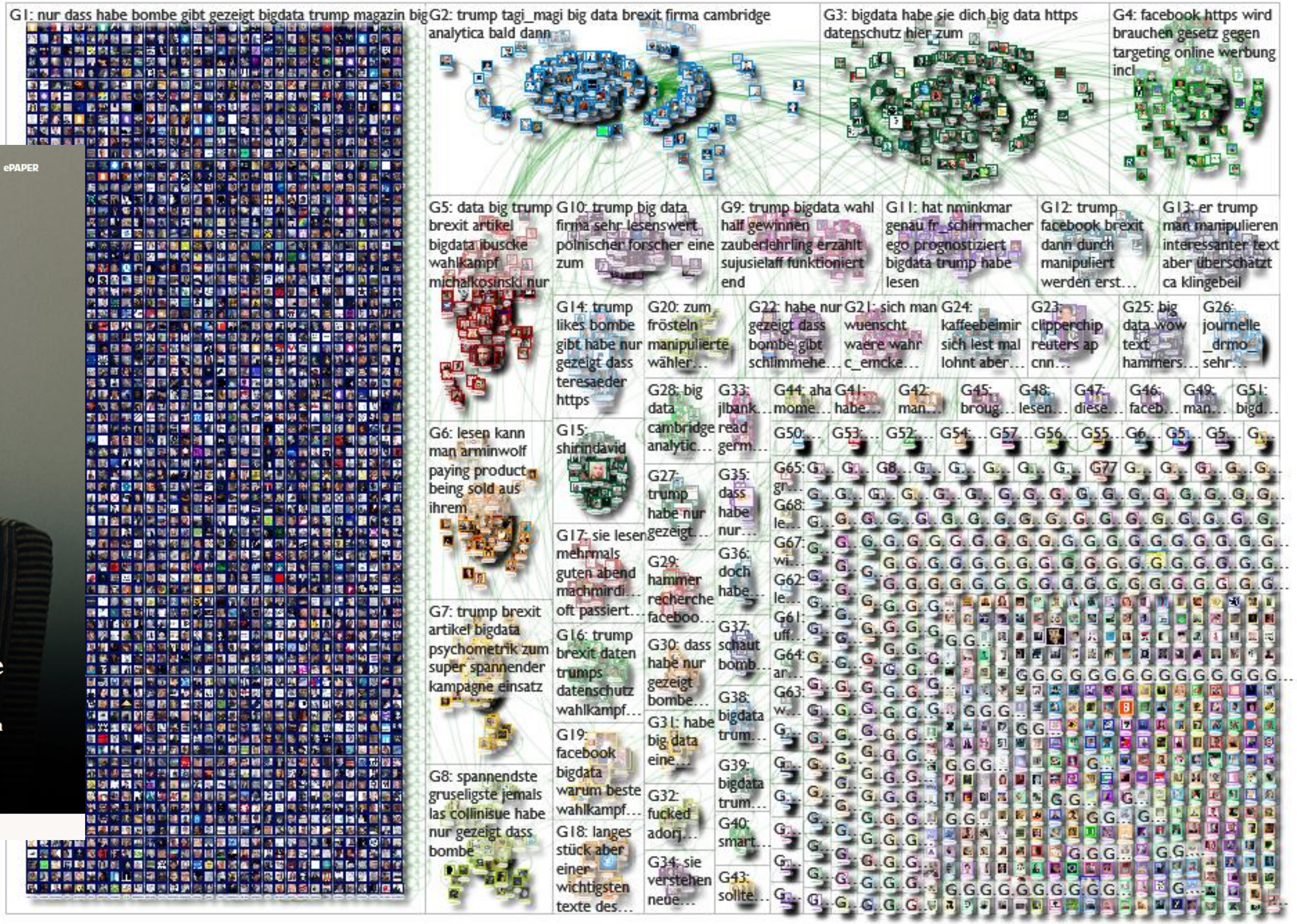
Track articles and analyze audiences



Search term: url:nytimes

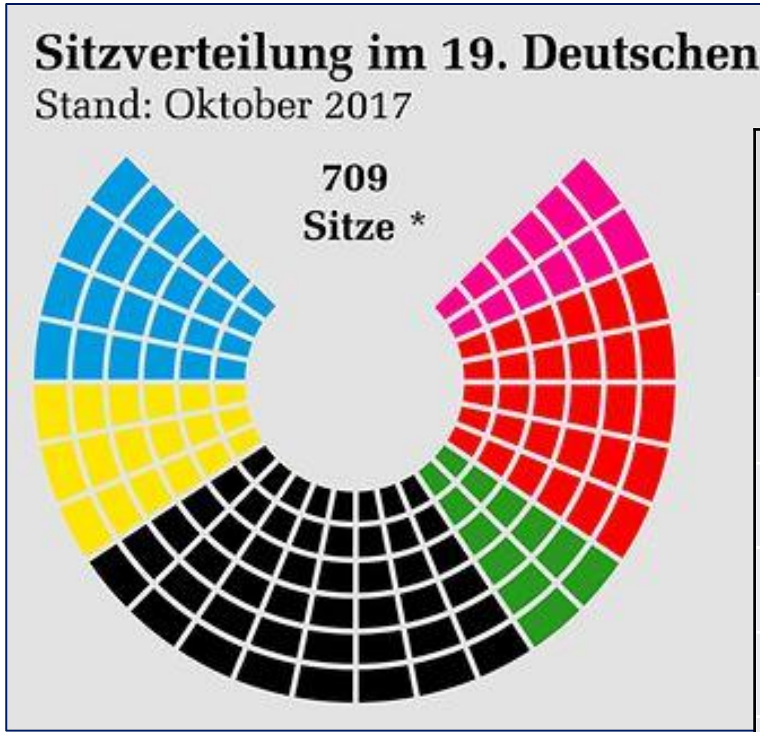
url:nytimes Twitter NodeXL SNA Map and Report for Tuesday, 24 September 2019: https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=210831

Search term: dasmagazin.ch/2016/12/03/ich-habe-nur-gezeigt-dass-es-die-bombe-gibt



https://www.dasmagazin.ch/2016/12/03/ich-habe-nur-gezeigt-dass-es-die-bombe-gibt/

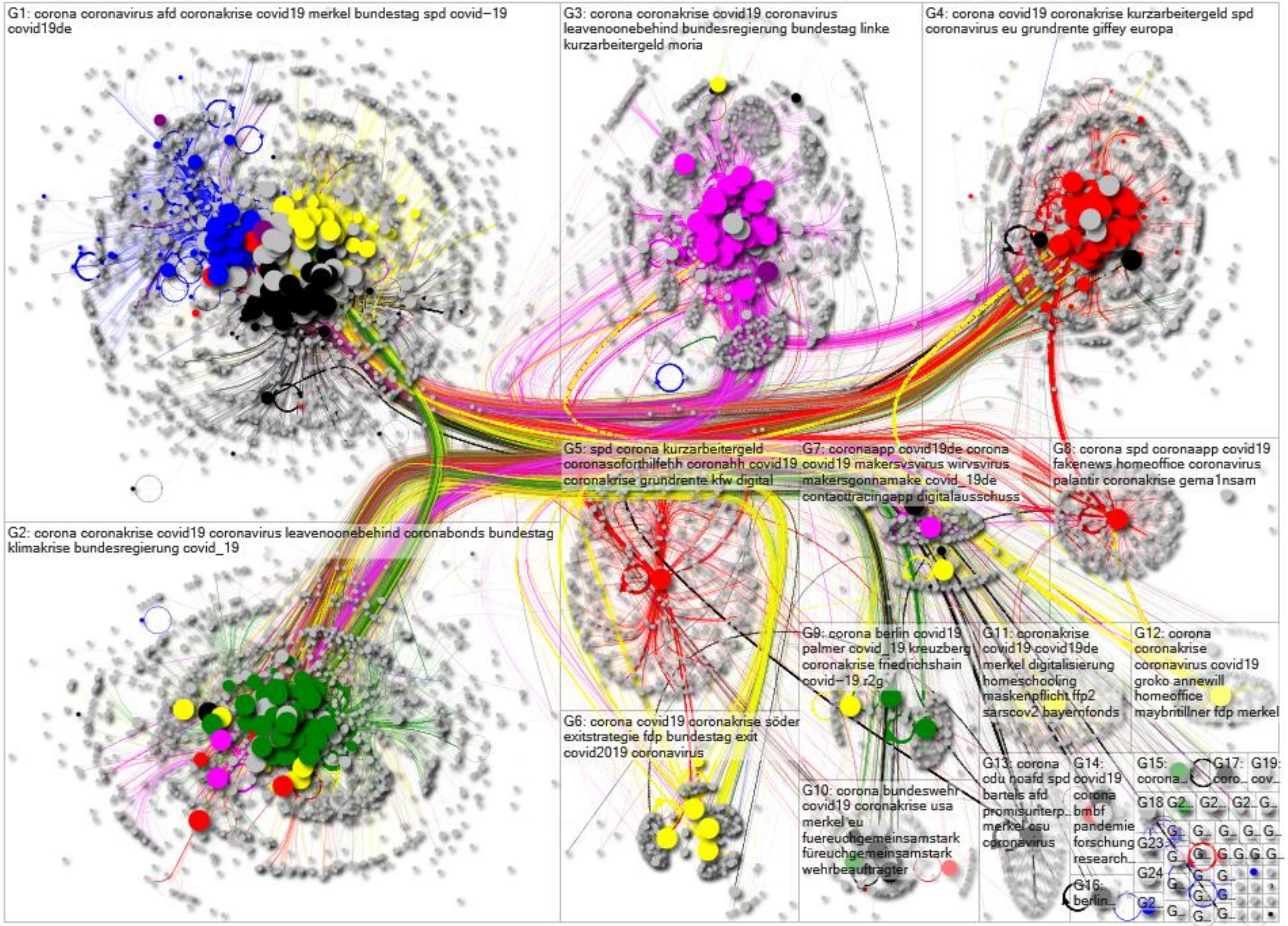
19. Bundestag: Twitter Useage



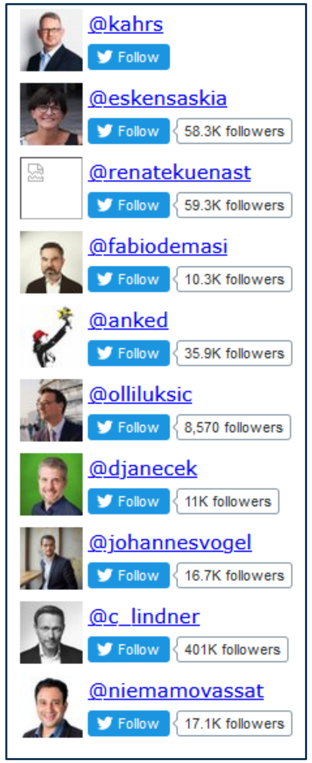
Party	Color	Seats	Twitter users	Twitter users per seat
CDU/CSU		246	131	53 %
SPD		153	123	80 %
AfD		92	85	92 %
FDP		80	72	90 %
Die Linke		69	60	87 %
B90/Die Grünen		67	64	96 %
no affiliation		2	2	100 %
All		**709**	**537**	**76 %**

https://www.bundestag.de/parlament/plenum/sitzverteilung_19wp

Full Network - April 2020

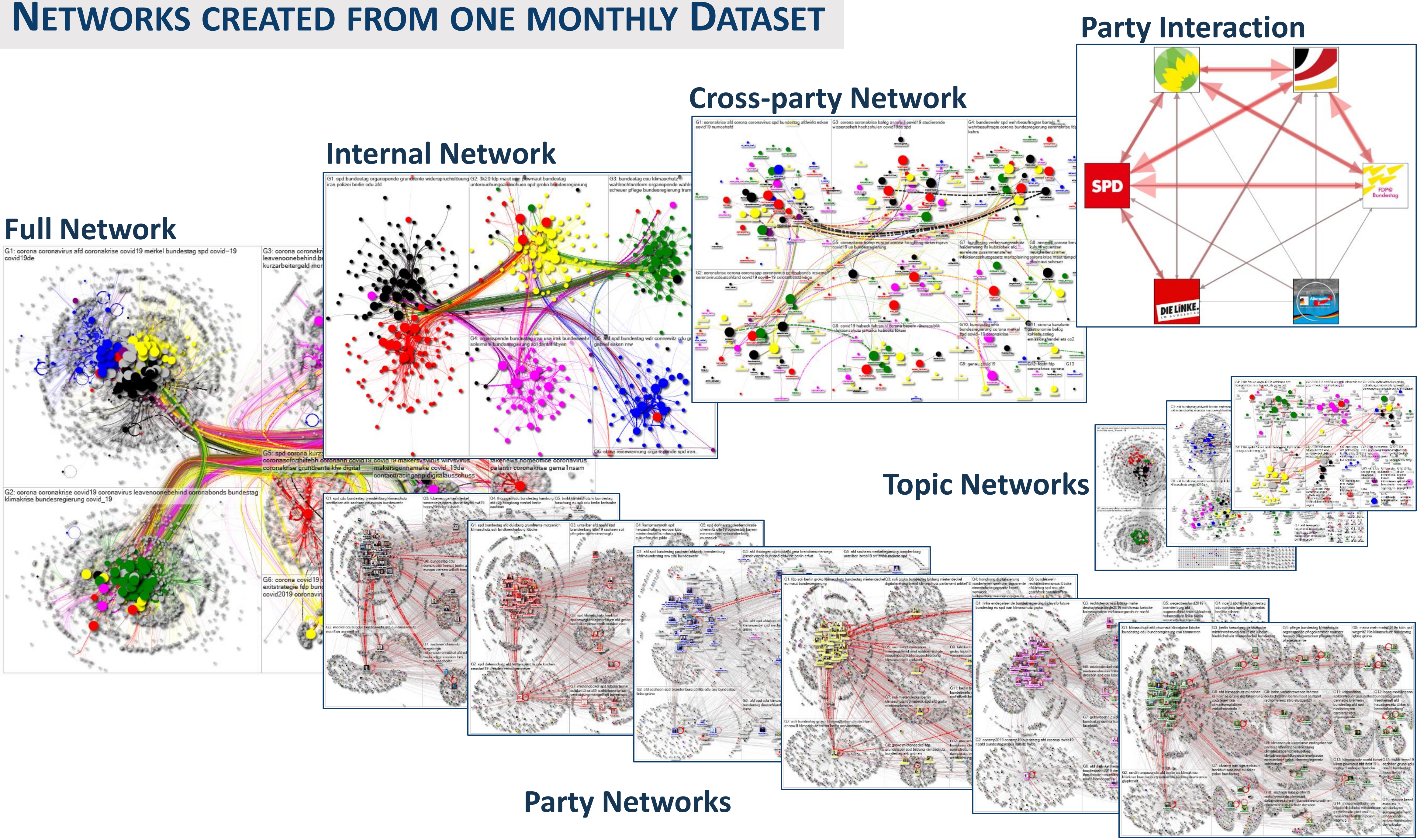


- Clauset-Newman-Moore cluster algorithm
- Group-In-A-Box Treemap layout
- Harel-Koren Fast Multiscale layout algorithm

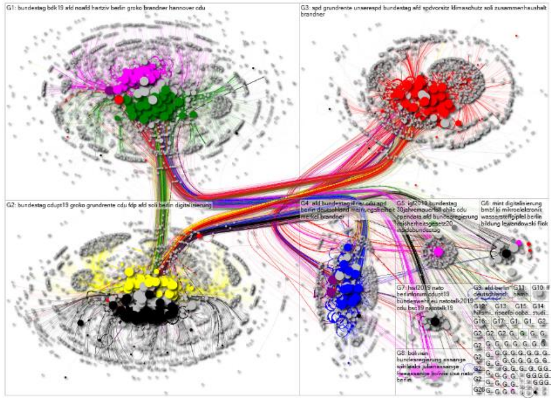


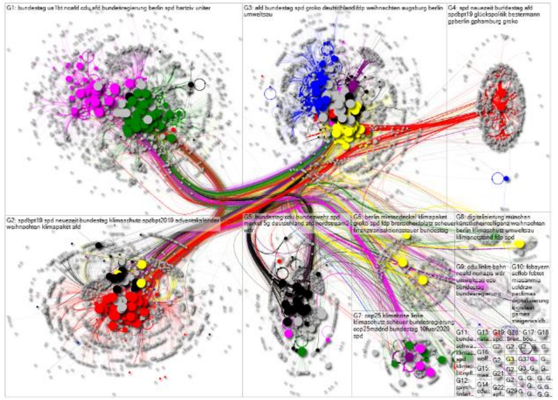
https://nodexlgraphgallery.org/Pages/Graph.aspx?graphID=228159

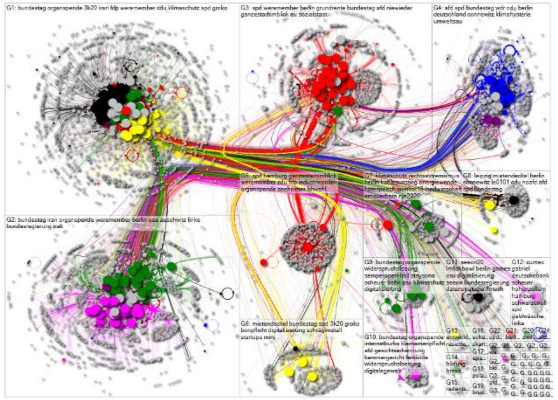
NETWORKS CREATED FROM ONE MONTHLY DATASET

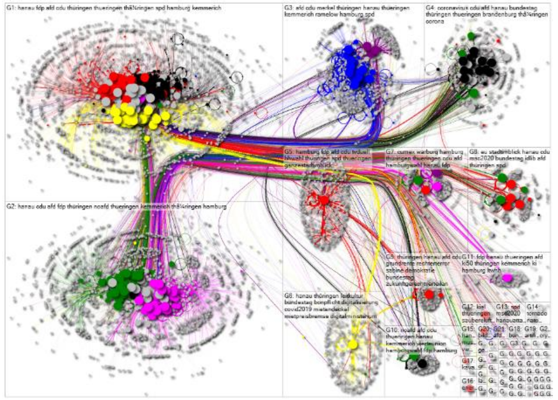


Comparing Networks Over Time

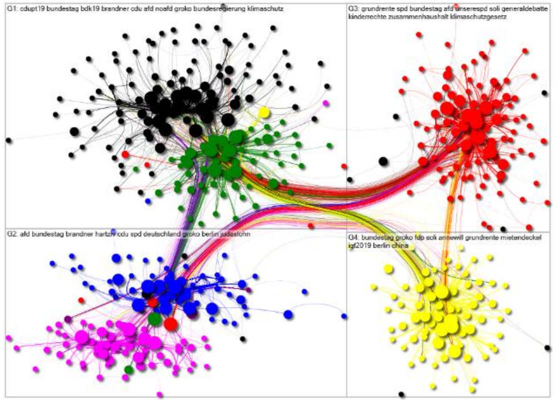


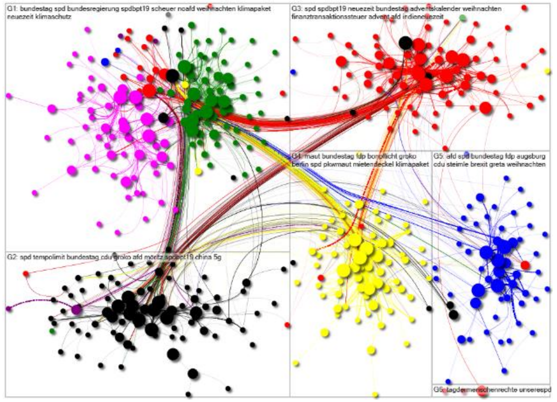


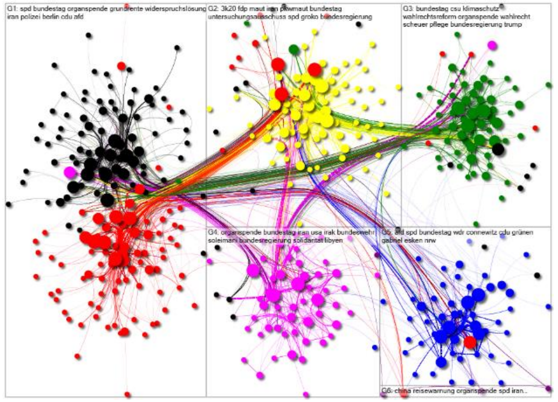


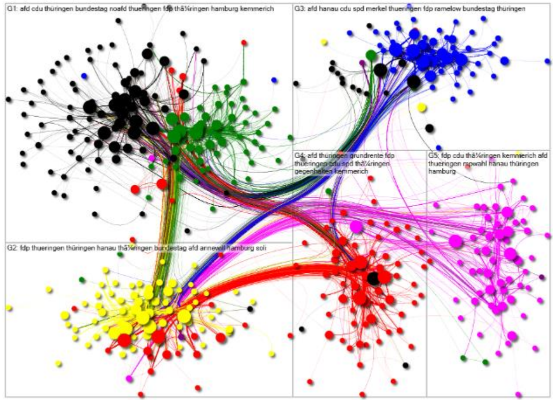


November 2019 December 2019 January 2020 February 2020

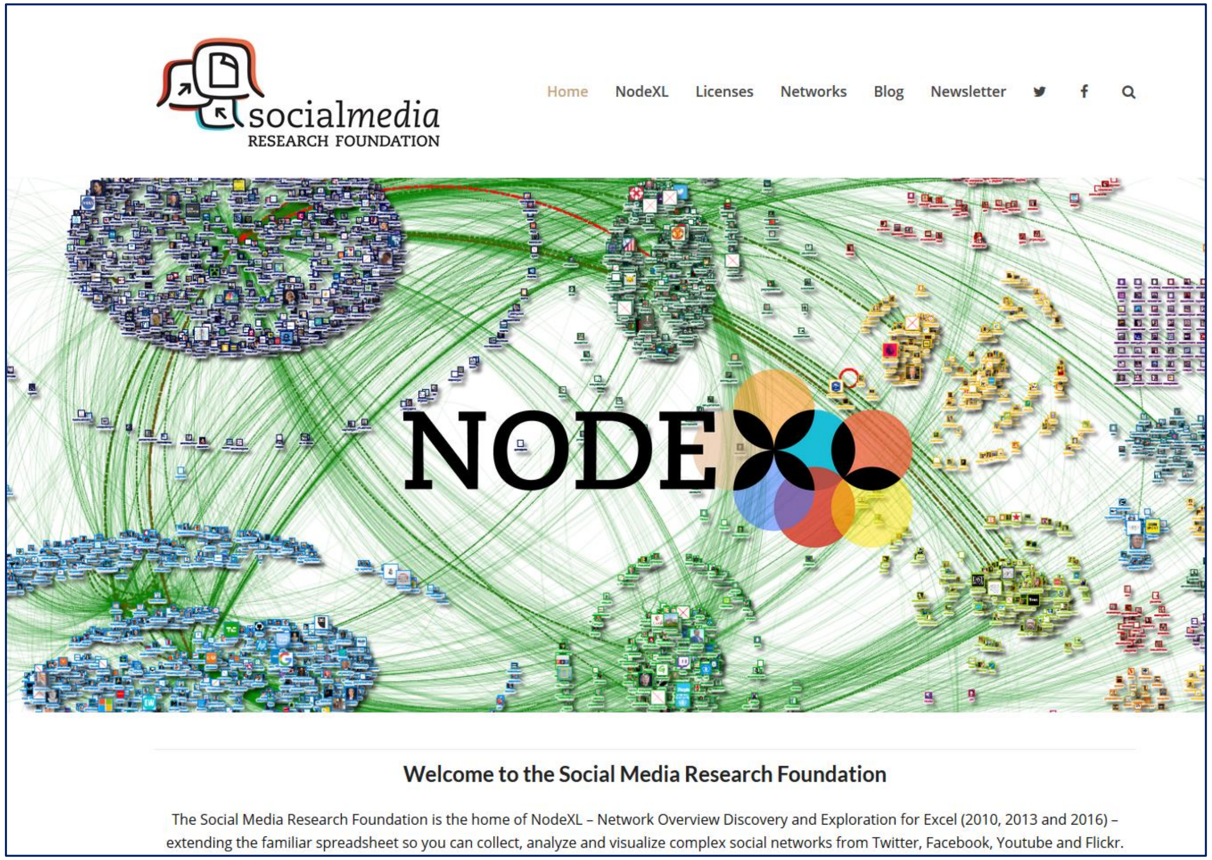


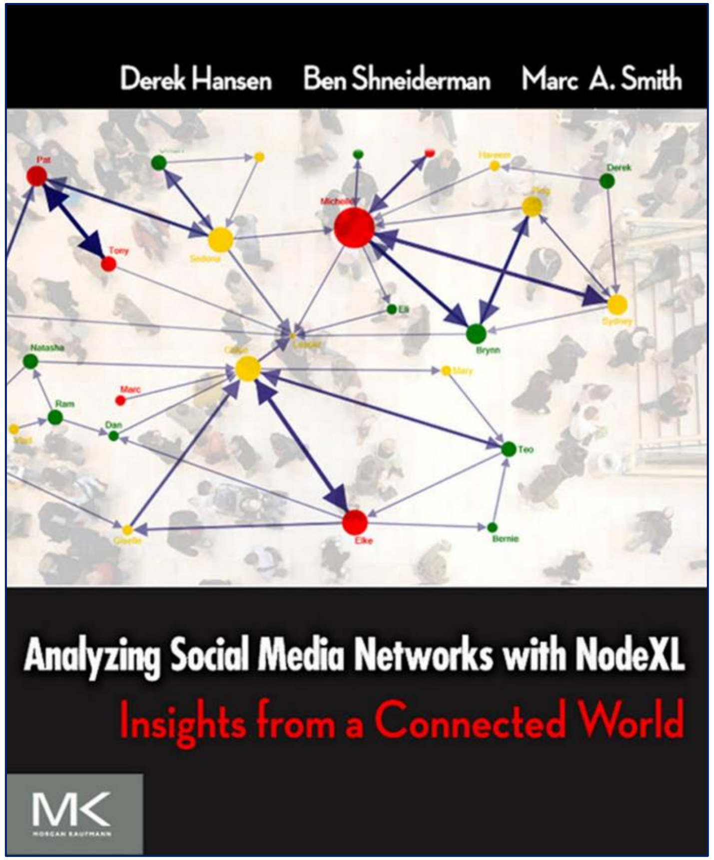






Social Media Research Foundation





https://www.smrfoundation.org/

https://www.nodexlgraphgallery.org/

Book: Derek Hansen, Ben Shneiderman and Marc Smith (2020): Analyzing Social Media Networks with NodeXL: https://www.elsevier.com/books/analyzing-social-media-networks-with-nodexl/hansen/978-0-12-817756-3

Literature / Links

Social Media Research Foundation and NodeXL

- Social Media Research Foundation: http://www.smrfoundation.org/
- NodeXL Graph Gallery: https://nodexlgraphgallery.org/
- Marc Smith | Network Mapping the Ecosystem: https://www.youtube.com/watch?v=kDiGl-2m868
- How to Automate NodeXL Pro: https://www.youtube.com/watch?v=mjAq8eA7uOM
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Key Features of NodeXL Pro

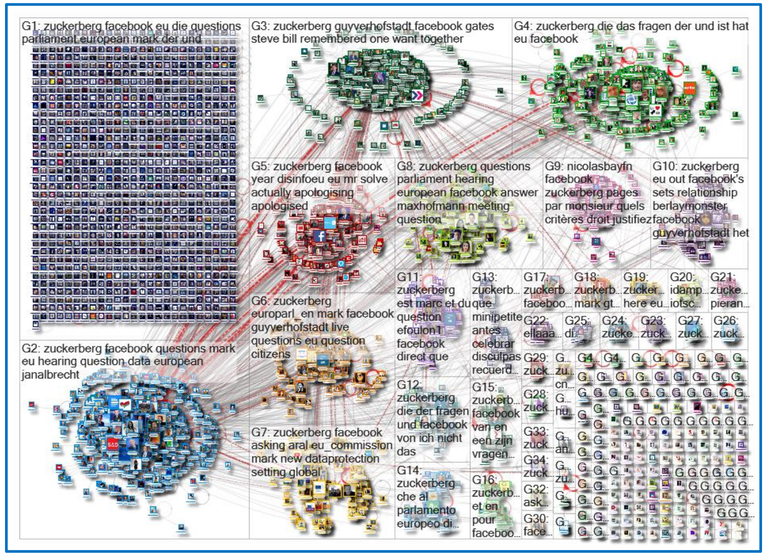
2. Network Analysis

- Network Metrics
- Group Metrics
- Vertex Metrics

3. Content Analysis

Text Analysis	Sentiment Analysis
Top Contents Analysis	Time Series Analysis

4. Visualization



1. Data Import

YouTube

6. Automation with Data Recipes

5. Publish

NODEXL GRAPH GALLERY

Key Features of NodeXL Pro

Data Import

Data formats
Excel/UCINET/GraphML/
Pajek/GEFX/GDF

Social media data

WIKIPEDIA
The Free Encyclopedia

YouTube

Flickr

Network Analysis

Network Overview
Network size and composition
Graph density, modularity

Group Analysis
Group by cluster
e.g. Clauset-Newman-Moore
Group metrics

Vertex metrics
Degree/In-/OutDegree
Betweenness/Closeness/
Eigenvector/ PageRank

Path Analysis

Content Analysis

Text Analysis
Words and word pairs from
Tweets, Posts, Replies, …

Sentiment Analysis
Positive/Negative Sentiment
Your list of Keywords

Top Content Summary
By entire network / by group
Top hashtags, URLs, domains
Top words and word pairs

Time Series Analysis
By minute/hour/day/…
By hashtag/word/language/…

Visualization

Customize
Shape, size, color, label of
vertices, edges and groups

Autofill Columns

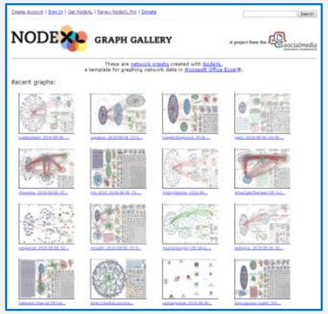
Graph Layout
Various layout algorithms
e.g. Harel-Koren Fast
Multiscale

Group-In-a-Box Layout
Treemap
Force-directed
Packed rectangles

Data Export

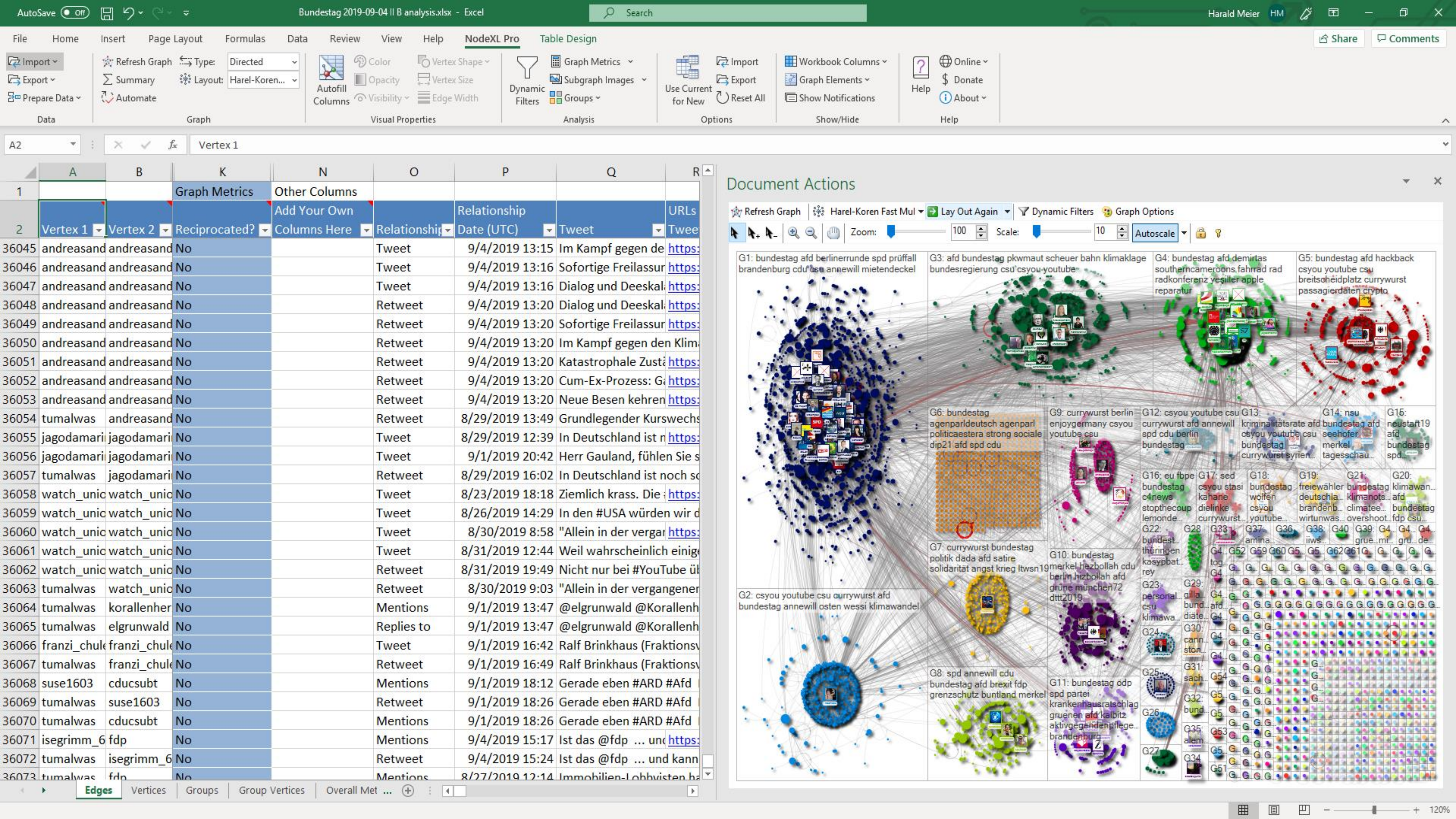
Data formats
Excel/UCINET/GraphML/
Pajek/GEFX/GDF

Publish to the web
NodeXL Graph Gallery



Export to Powerpoint
Export to Polinode

Automate Key Features with NodeXL Data Recipes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Tutorial Preparation

NodeXL Pro requires:

- **User license:** You will receive an email with a NodeXL Pro Student Trial User license and installation instructions shortly.
- **OPERATING SYSTEM:** Microsoft Windows ™(7, 8, 10)
- **SOFTWARE:** Microsoft Office™ (2007, 2010, 2013, 2016, 365)

Tutorial Requirements:

- To download data from Twitter, you need a Twitter account!

If you run into any installation issues, please have a look at this page:
https://www.smrfoundation.org/nodexl/installation/

Feel free to request tech support from team NodeXL by filling out this form.

Session 1: For Mac / Linux Users: How to install a virtual machine via Amazon Web Services (Amazon account is required; small costs may occur)
Topic: Node XL Pro - Technical Session: Installing Node plugin and getting started.
Time: Jun 16, 2020 11:00 AM London
Join Zoom Meeting https://us02web.zoom.us/j/89012594289 Meeting ID: 890 1259 4289

Session 2: Topic: Node: NodeXL plugin workshop: How to create a social network and content analysis
Time: Jun 23, 2020 10:00 AM London
Join Zoom Meeting https://us02web.zoom.us/j/85719168917 Meeting ID: 857 1916 8917