

Spreading Phenomena

Social Networks Analysis and Graph Algorithms

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Sources

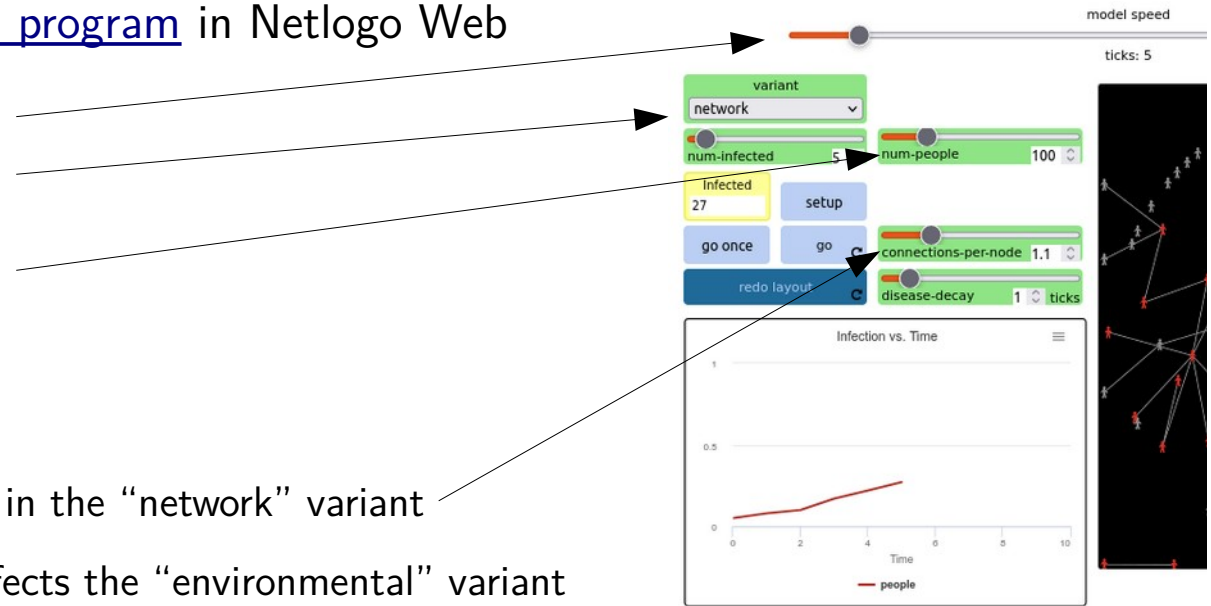
- D. Easley and J. Kleinberg (2010). Networks, Crowds, and Markets — [Chapter 19](#)
- C. Castillo, W. Chen, L. V. S. Lakshmanan (2012). Information and Influence Spread in Social Networks, [KDD Tutorial](#).
- F. Menczer, S. Fortunato, and C. A. Davis. A First Course in Network Science. Cambridge University Press, 2020 — Chapter 7.
- URLs cited in the footer of slides

Exercise

Spread of Disease

Go to netlogoweb.org/launch and select:
“IABM Textbook / chapter 6 / Spread of Disease”

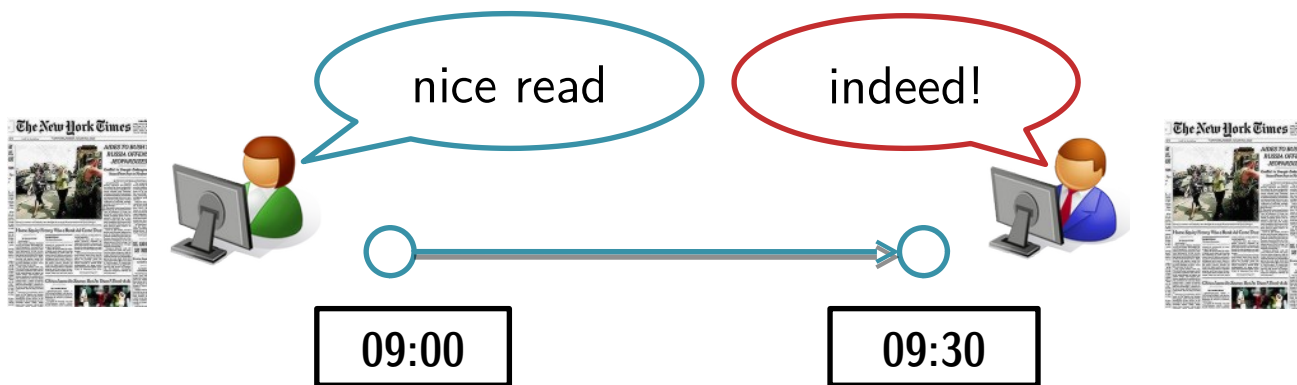
- Execute the “Spread of Disease” program in Netlogo Web
 - Slow down model speed
 - Choose one variant
 - Select num-people 100
 - Click “set-up”
 - Click “go”
 - Play with “connections-per-node” in the “network” variant
 - Note that “disease-decay” only affects the “environmental” variant
- Indicate what the three variants do (network, mobile, environmental)



Pin board: <https://upfbarcelona.padlet.org/chato/k5zn9l4itg3axw3s>



Social influence on a network



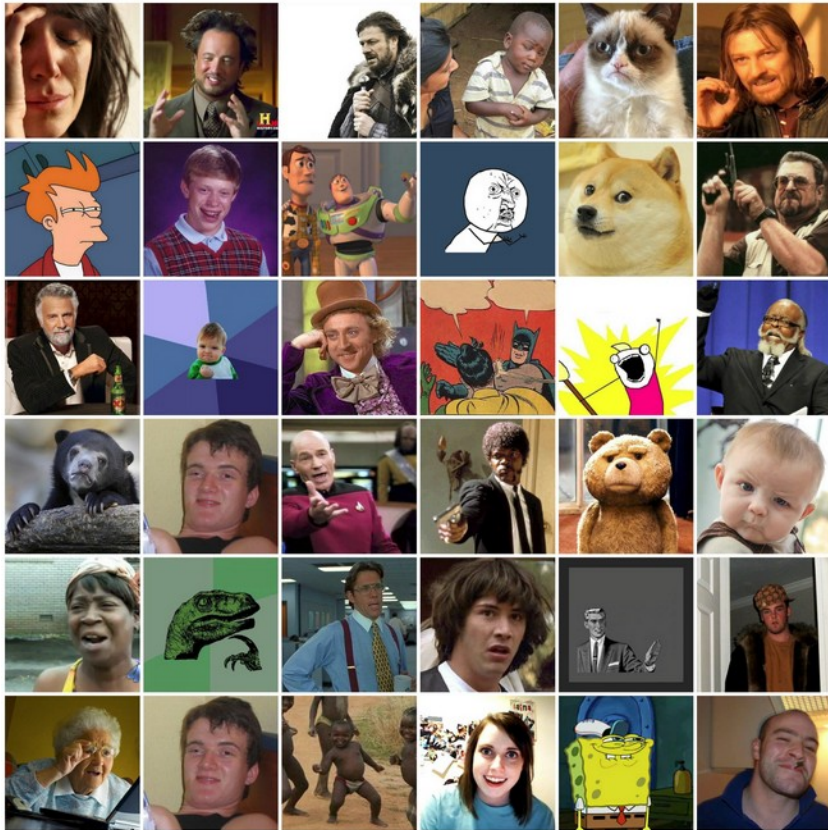
People are connected and perform actions

↓
friends, fans,
followers, ...

↓
comment, link, like,
share, stitch, duet, ...

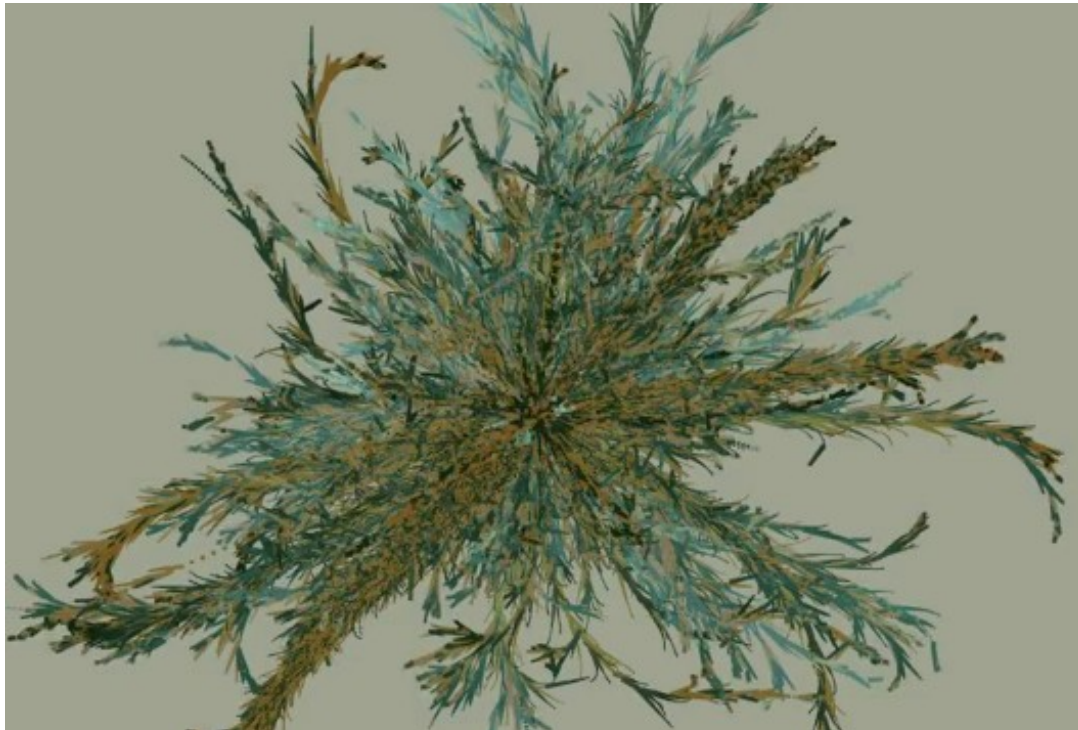
“The Selfish Gene” by Richard Dawkins (1976)

Chapter 11: “Memes: the new replicators”

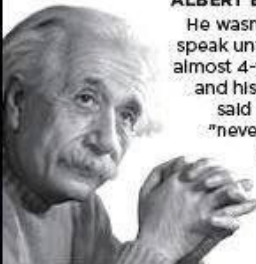
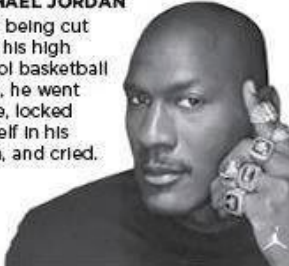

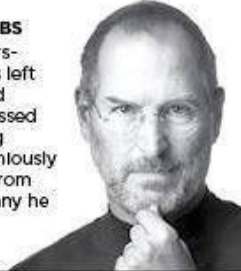




Spread of a Meme

("Famous Failures")








<https://vimeo.com/50730795>

FAMOUS FAILURES	
 <p>ALBERT EINSTEIN He wasn't able to speak until he was almost 4-years-old and his teachers said he would "never amount to much"</p>	 <p>MICHAEL JORDAN After being cut from his high school basketball team, he went home, locked himself in his room, and cried.</p>
 <p>WALT DISNEY Fired from a newspaper for "lacking imagination" and "having no original ideas."</p>	 <p>STEVE JOBS At 30-years-old he was left devastated and depressed after being unceremoniously removed from the company he started.</p>
 <p>OPRAH WINFREY Was demoted from her job as a news anchor because she "wasn't fit for television."</p>	 <p>THE BEATLES Rejected by Decca Recording Studios, who said "We don't like their sound—they have no future in show business."</p>
IF YOU'VE NEVER FAILED, YOU'VE NEVER TRIED ANYTHING NEW	



Top TikTok Songs This Week

LAST UPDATED 7/31/2022, 8:00:25 AM

- | | | |
|---|---|---|
| 1 | Kevin MacLeod & Kevin The Monkey
Monkeys Spinning Monkeys
— · 102.4M views · 202 popular videos |  |
| 2 | anantavinnie
Left right x pak vong x rindu semalam x meneket...
▲ 51 · 103.2M views · 119 popular videos |  |
| 3 | WZ Beat
Beat Automotivo Tan Tan Tan Viral
▼ 1 · 52.2M views · 91 popular videos |  |
| 4 | Bizarrap & Quevedo
Quevedo: Bzrp Music Sessions, Vol. 52
▼ 1 · 29.2M views · 65 popular videos |  |
| 5 | Luclover
L\$d
▲ 3 · 41.1M views · 64 popular videos |  |



Various forms of “trend”:
music/audio that is re-
used, stitches, side-by-
side “duets”,
actions/challenges, etc.



sydney_copelandd • Follow
Paid partnership with vitalproteins

sydney_copelandd It's #matchamonday! Have you tried @vitalproteins new Matcha Collagen? It's delicious with 50mg of caffeine it's a great alternative to coffee! @dacey76 @connoisseurness you both need to try this!!

#ad #vitalinfluencer #sponsored #stayvital #matchamonday #vitalproteins #healthylifestyle #delicious #collagen #caffeine #trytout #amazing #vitalathlete

12m

brittanyanfield ok then miss influencer 🤔🤔🤔

35 likes
17 MINUTES AGO

Add a comment... Post



gossmakeupartist • Follow

gossmakeupartist Who has tried the @sundriley luna night oil? I try a LOT of skincare but this is one that I keep coming back to. It's a retinol in an oil form so is nourishing for the skin while doing renewal like a retinol - absolutely love this product!! Join the Waitlist - link in bio! @cultbeauty

#WayneGossXCultBeauty #ad

Load more comments

kelsey_chronicbeauty @sundriley Luna oil has been my holy grail night serum for 3 years now! 🥰

kal_ho_naa_ho76 Also use this often. :) callmeffiii It's so good. It removes my small wrinkles after one night's sleep

clareflintmakeupyork Just starting using this, is so lovely 🥰

6,217 likes
APRIL 21

Log in to like or comment...



hilaryduff • Follow

120k likes

hilaryduff Summertime sippin' with some delicious @sparklingice. Show me how you #FlavorUp #ad bit.ly/1VkhEFC

view all 596 comments

daniel__ferreira__ @kealeyjo exploringwithaj 🥰🥰🥰

issabae Omg I love those 🥰🥰

ehabseirafi 🥰🥰🥰

erikrichison "Hey Jesse, babe." @chambreezey

abbeyrubby Lime is the best

mike_nelly Pretty cool

natalie__evenson333 @michellelafard @katb63

hippielovee @ratchetnasty_

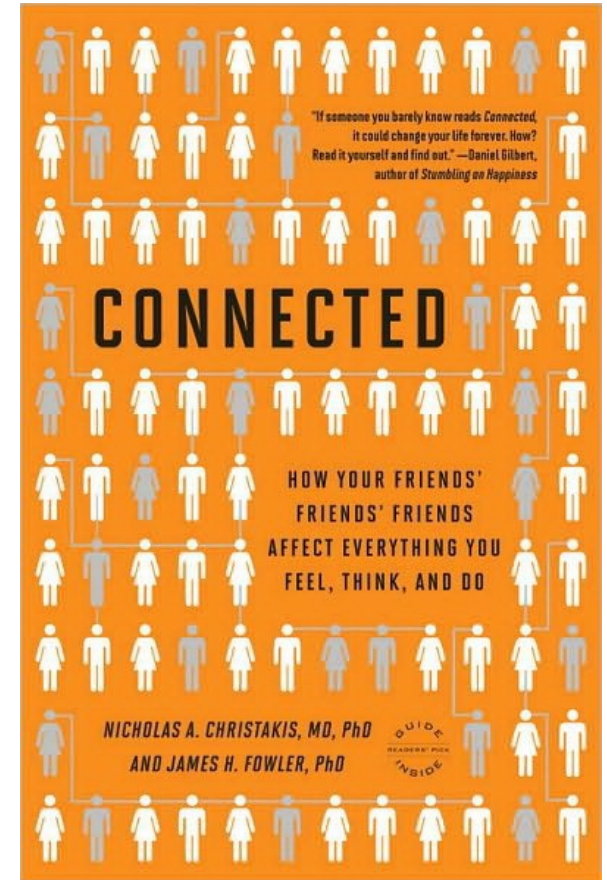
tombender191 @hilaryduff Hilary, it is my dream to be shrunk like in honey I shrunk the kids and fall into your cereal bowl!

Add a comment...

“Influencers” and their sponsored posts

Non-trivial examples

- **Back pain:** spread from West to East in Germany after fall of Berlin Wall
- **Suicide:** well known to spread throughout communities on occasion
- **Sexual “scripts”:** expected sequences of behaviors during intimate situations
- **Politics:** the denser your connections, the more intense your convictions



Exercise

Find examples of spreading phenomena

What else propagates in a contagion-like manner?

Pin board: <https://upfbarcelona.padlet.org/chato/a0xnaoohsfc117nl>

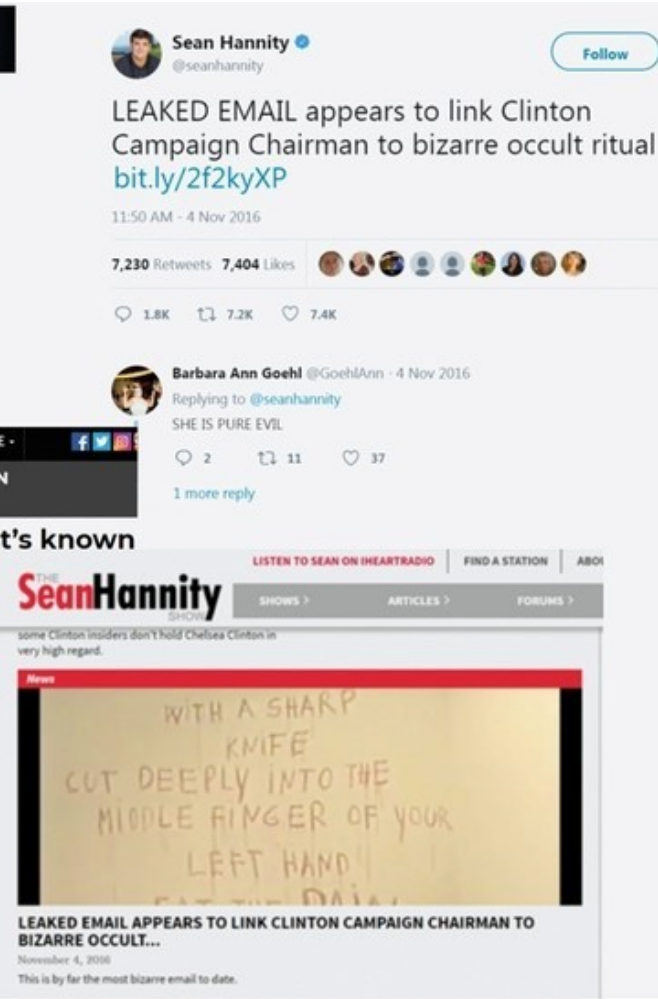
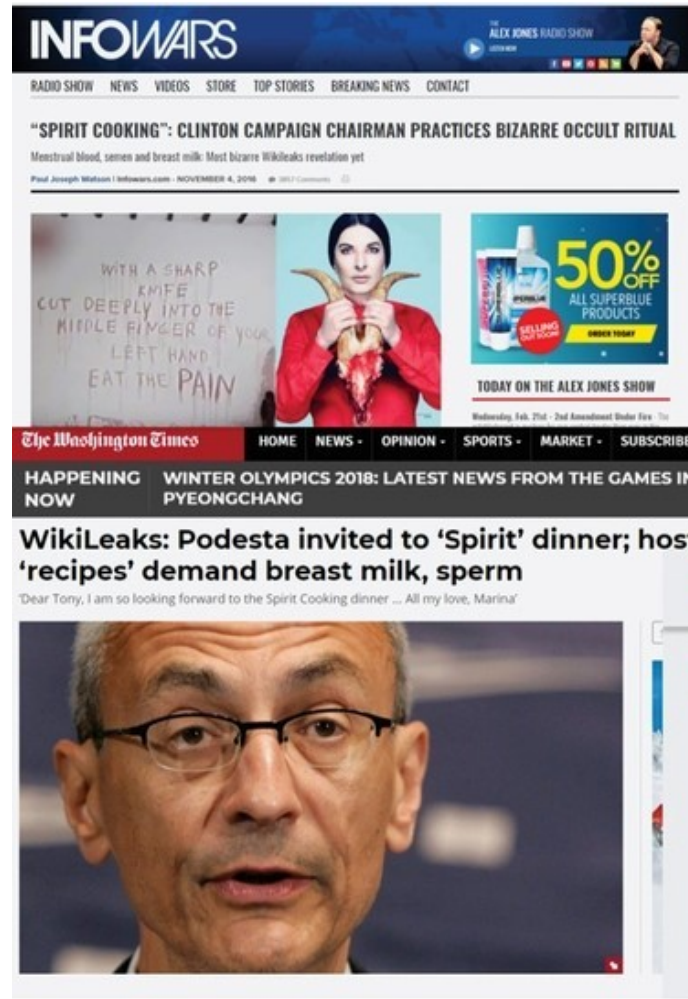


News, misinformation, and collective action

Fake news

Fake news about an occult ritual to which the campaign chairman of US presidential candidate Hillary Clinton was invited.

This was posted four days before the 2016 election, which was won by her opponent, Donald Trump.

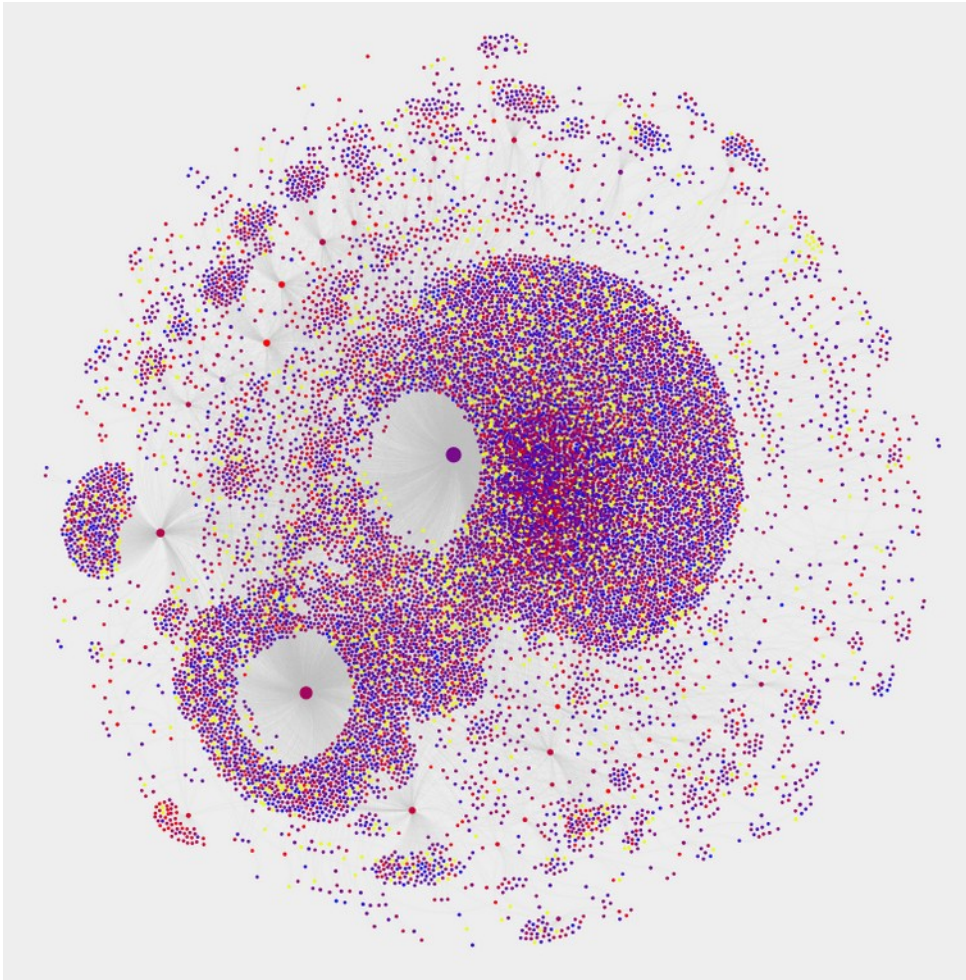


Fake news spread

A combination of authentic (blue) and inauthentic (red) accounts, also known as bots. Yellow nodes were removed by Twitter and are probably also bots.

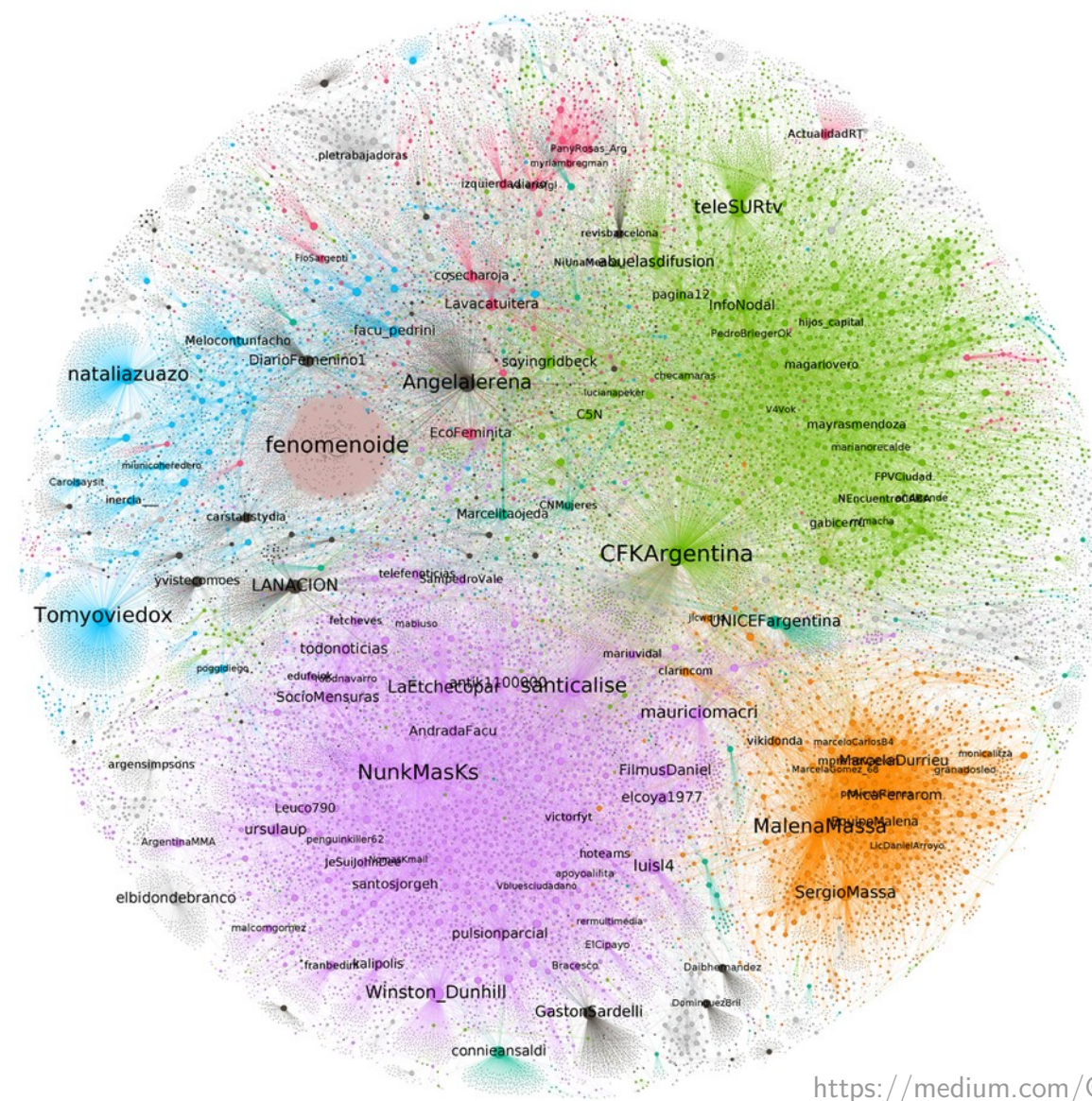
Interactive version:

<https://iunetsci.github.io/HoaxyBots/>



Collective action

Spread of the #NiUnaMenos hashtag: a movement against gender-based violence and femicide started in Argentina in 2015



Colors based on communities detected through modularization optimization

Summary

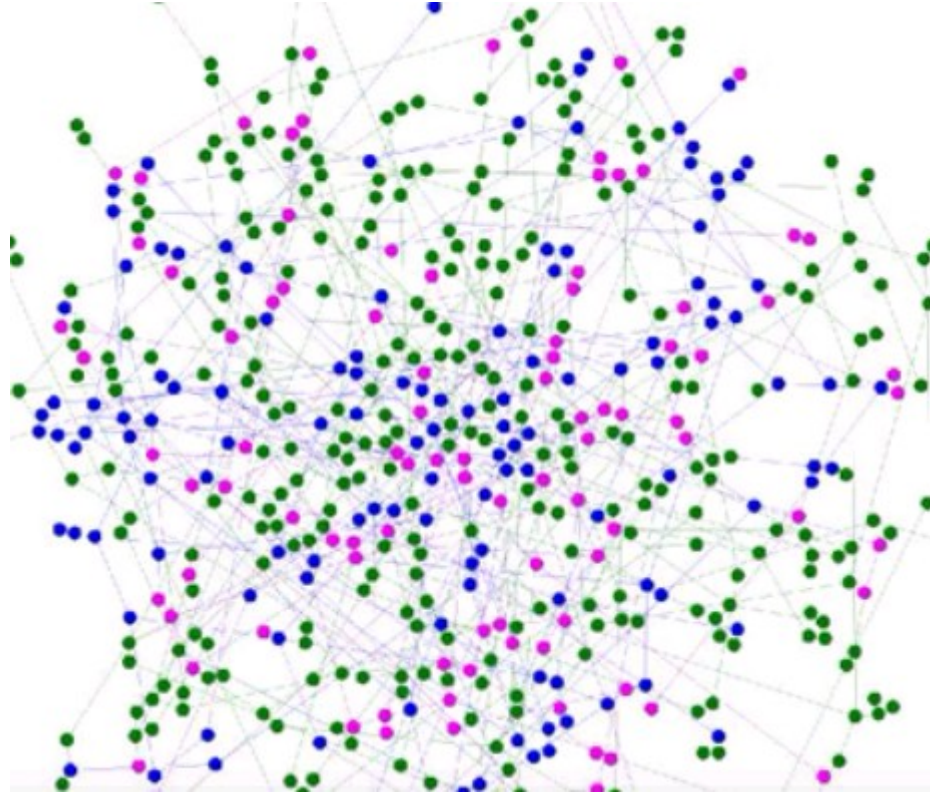
Things to remember

- Direct social influence is observed online when connected people perform an action in sequence
- A wide array of phenomena spread through networks, not only viruses and information

Additional contents

EXTRA

Simulated contagion in graph



<https://www.youtube.com/watch?v=WWTmRIDsydA>