Spreading Phenomena

Social Networks Analysis and Graph Algorithms

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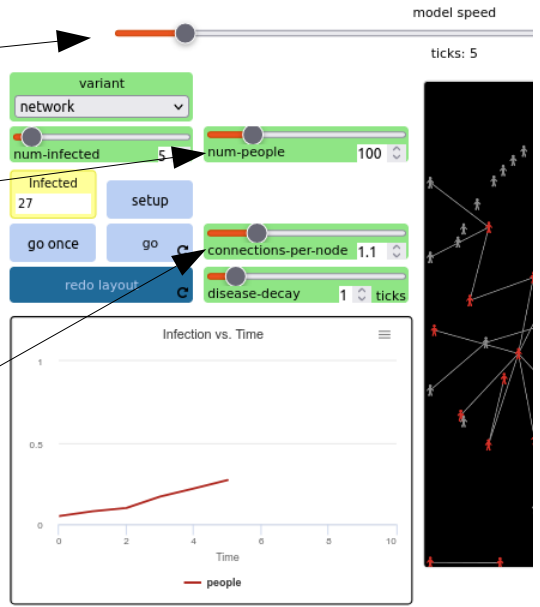
Sources

- 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"

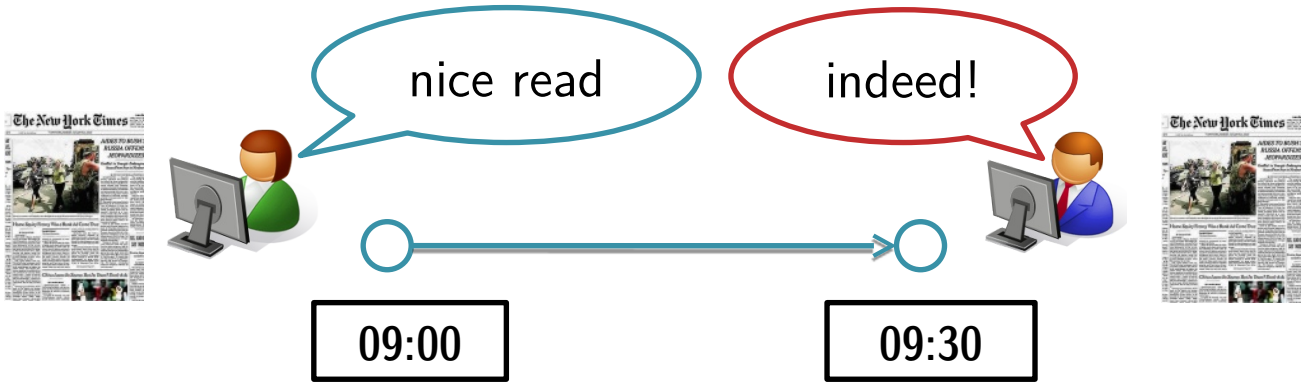
- Execute the "Spread of Disease" program in Netlogo Web
  - Slow down model speed
  - Choose one variant
  - Select num-people 100
  - Click "set-up"
  - Click "go"
  - Play with "connections-per-node" in the "network" variant
  - Note that "disease-decay" only affects the "environmental" variant



- **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**

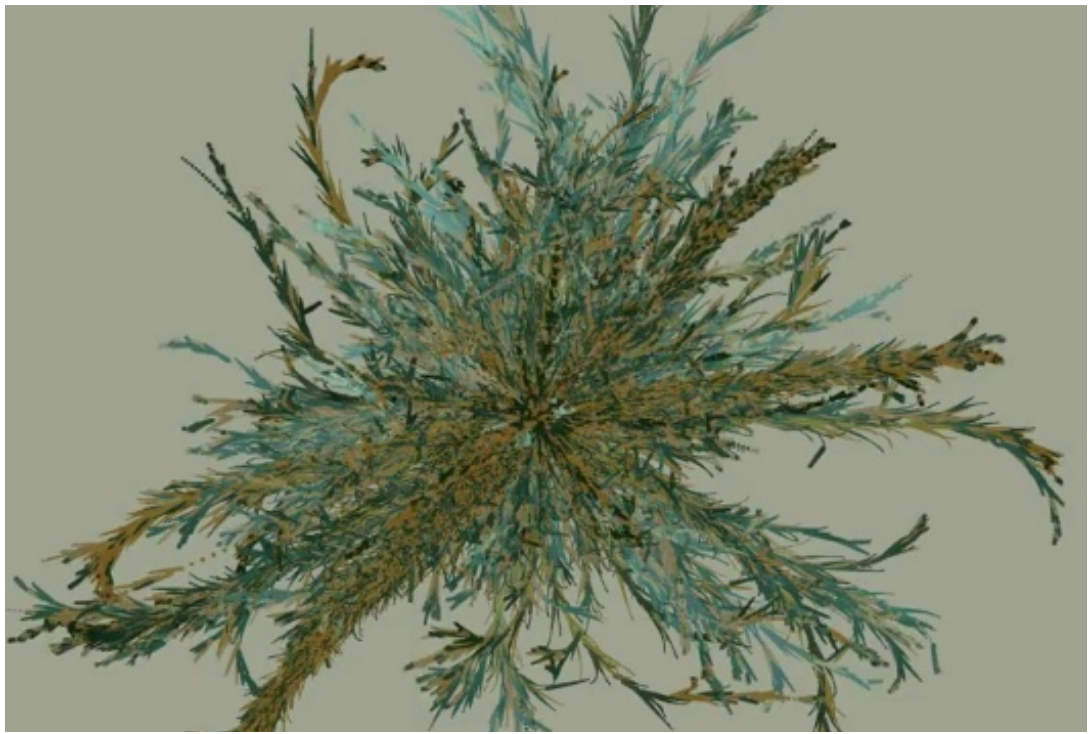
friends, fans, followers, ...

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")



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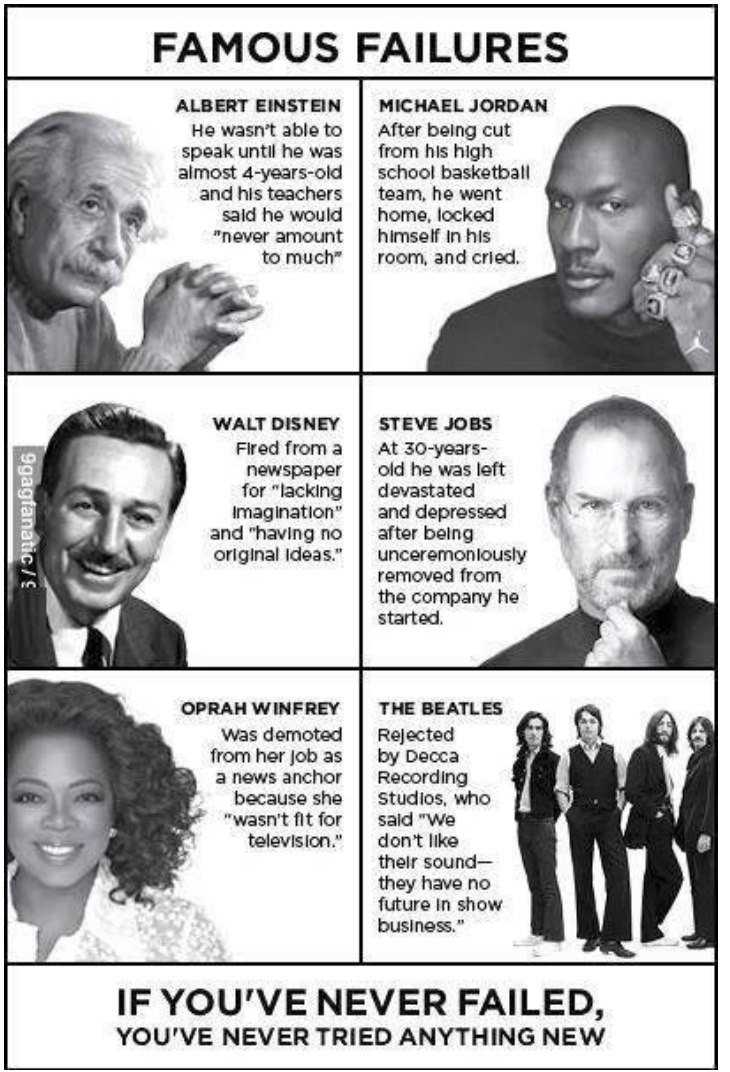
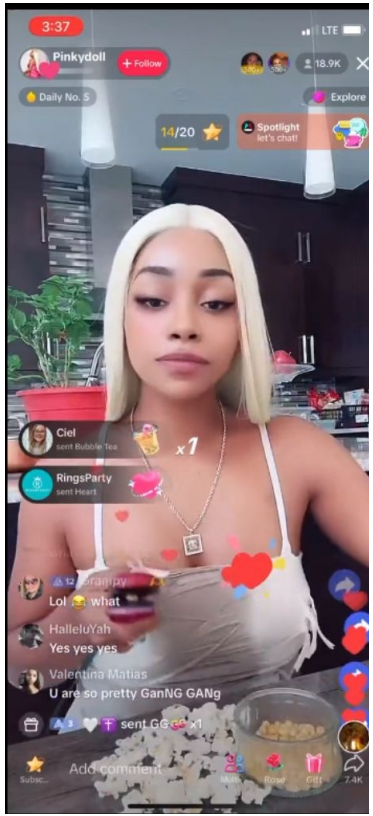


Vine

TikTok



Top TikTok Songs This Week

LAST UPDATED 31/05/2023, 11:33:53

1	The King Khan & BBQ Show **Love You So** ▲2 · 946.2M views · 990 popular videos	
2	**money trees** ▼1 · 478.8M views · 694 popular videos	
3	Kevin MacLeod & Kevin The Monkey **Monkeys Spinning Monkeys** ▼1 · 421.8M views · 567 popular videos	
4	Sadu **original sound - avantgarde055** — · 191M views · 314 popular videos	
5	Tollan Kim **Aesthetic** ▲1 · 184.4M views · 302 popular videos	

https://tokboard.com/

TikTok

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

sydney_copelannd • Follow
Paid partnership with vitalproteins

sydney_copelannd It's #matchamonday 💚Have you tried @vitalproteins new Matcha Collagen? It's delicious with 50mg of caffeine it's a great alternative to coffee 😍 @staceyj76 @connorrgnimess you both need to try this!!!
.
.
.
#ad #vitalinfluencer #sponsored #stayvital #matchamonday #vitalproteins #healthylifestyle #delicious #collagen #caffeine #tryitout #amazing #vitalathlete

17m

briittanycanfield ok then miss influencer 😭😭😭

35 likes
17 MINUTES AGO

Add a comment... Post

gossmakeupartist • Follow

gossmakeupartist Who has tried the @sundayriley 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 @sundayriley Luna oil has been my holy grail night serum for 3 years now! 😍

kal_ho_naa_ho76 Also use this often. :)

callmefifiii It's so good. It removes my small wrinkles after one night's sleep

clareflintmakeupyork Just starting using this, is 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 😍😍😍

isssabae Omg I love those 😍💜

ehabseirafi 😍😍😍

erikrichison "Hey Jesse, babe." @chambreezey

abbeyruby Lime is the best

mike_nelly Pretty cool

natalie_evenson333 @michellefafard @katb63

hippielovee @ratchetnasty_

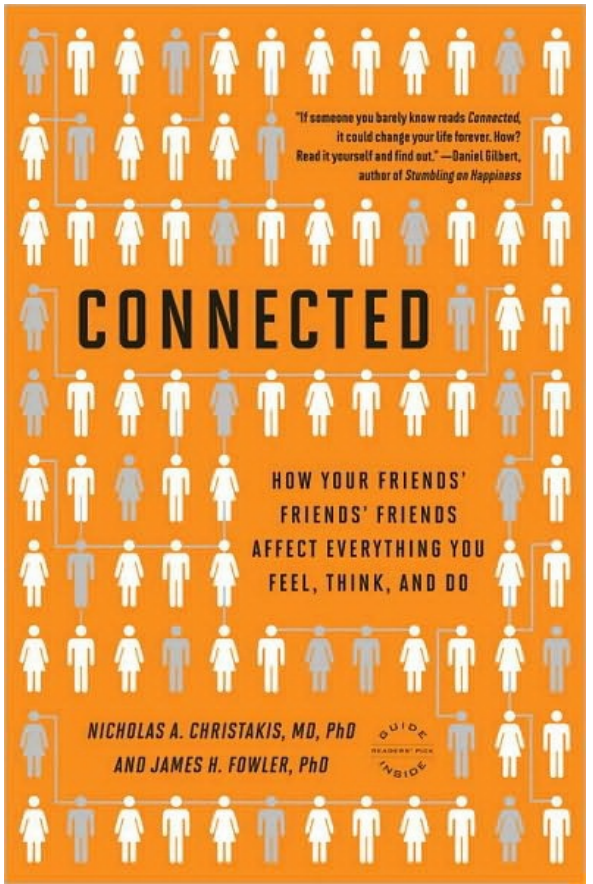
tombender191 @hilaryduff Hilary, it is my dream to be shrunk like in honey I shrunk the kids and fall into your cereal bowl

Add a comment... ooo

"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?

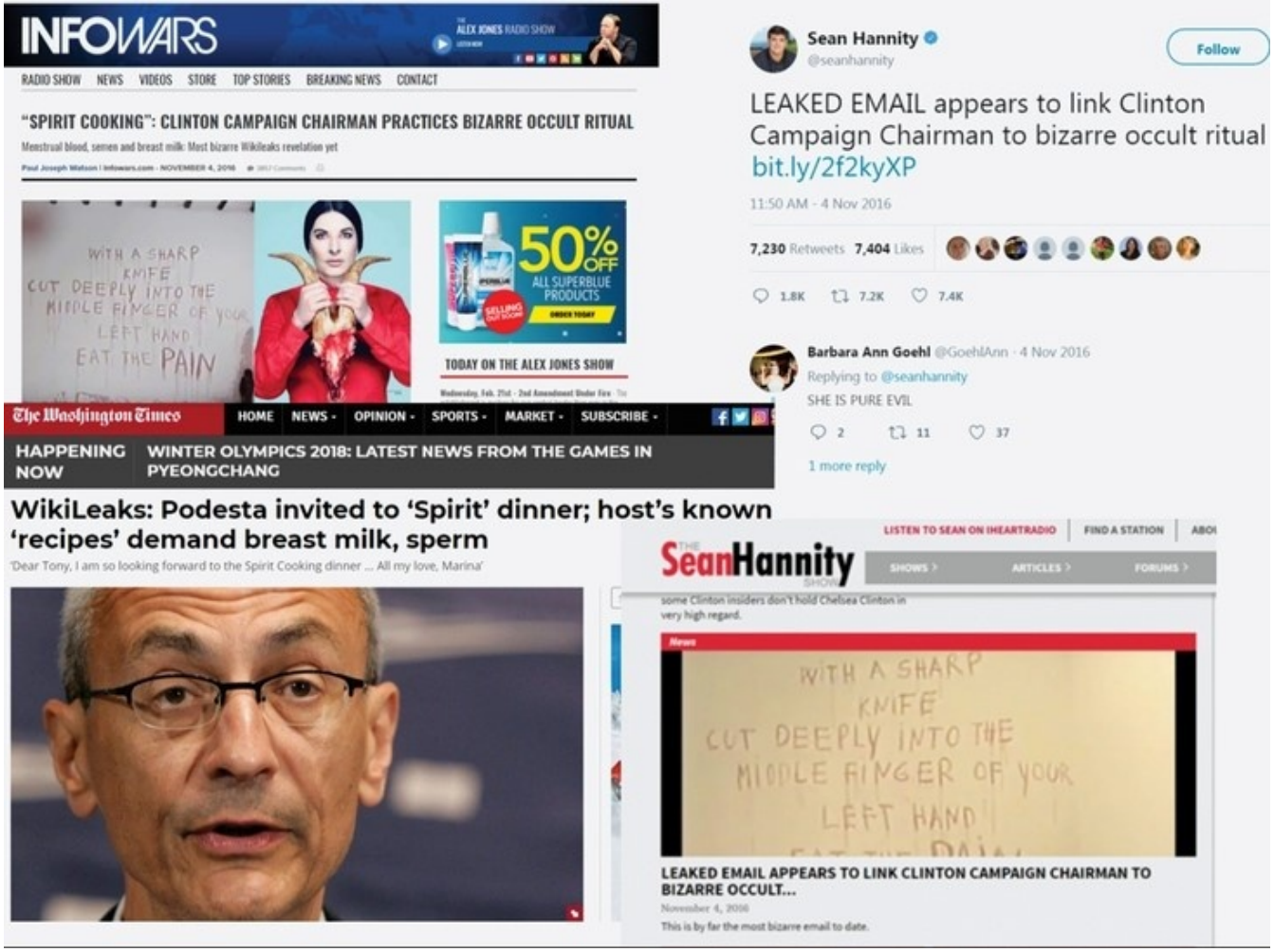
Pin board: https://upfbarcelona.padlet.org/chato/a0xnaoohsfc117nl

News, misinformation, and collective action

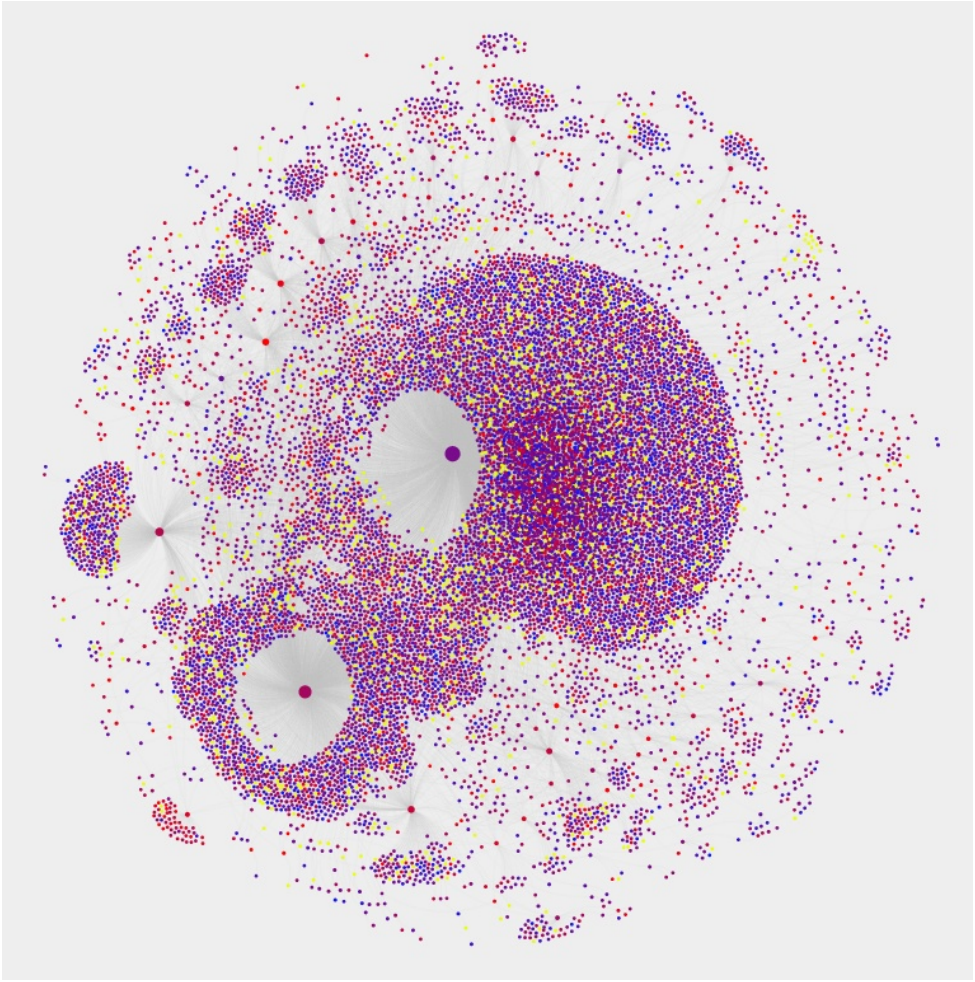
Fake news

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.



Chapter 7, The Propaganda Pipeline: Hacking the Core from the Periphery in *Network Propaganda: Manipulation, Disinformation, and Radicalization in American Politics* (2018), https://doi.org/10.1093/oso/9780190923624.003.0007



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

https://medium.com/@rusosnith/analizando-el-niunamenos-en-las-redes-1c49bd9c5781

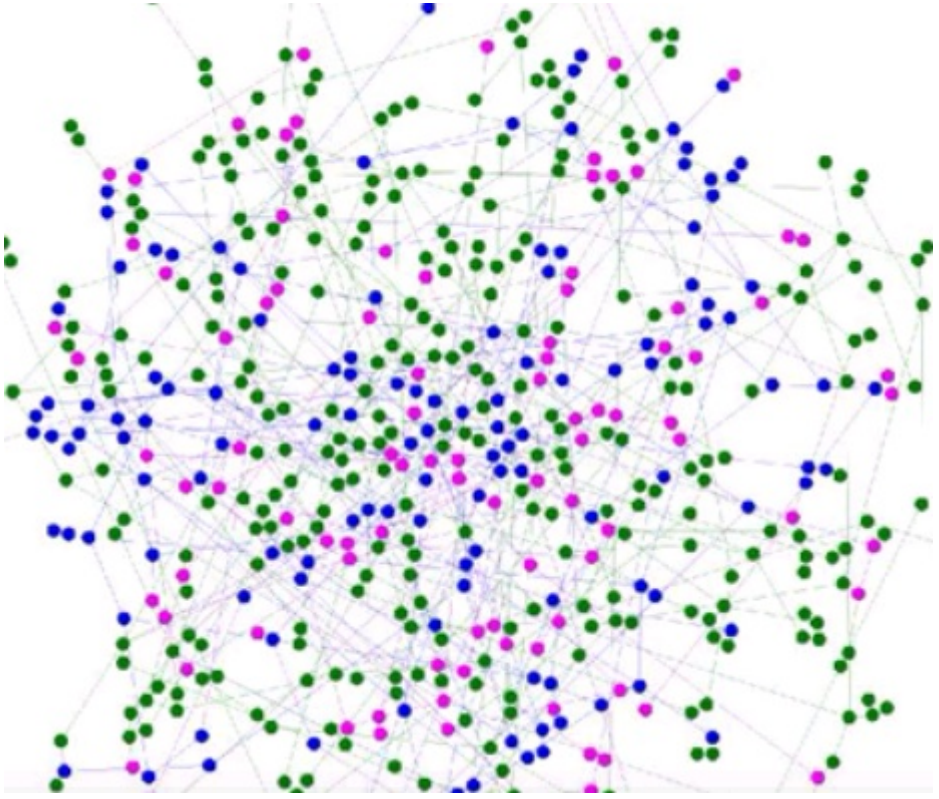
Summary

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

Simulated contagion in graph



https://www.youtube.com/watch?v=WWTmRlDsydA