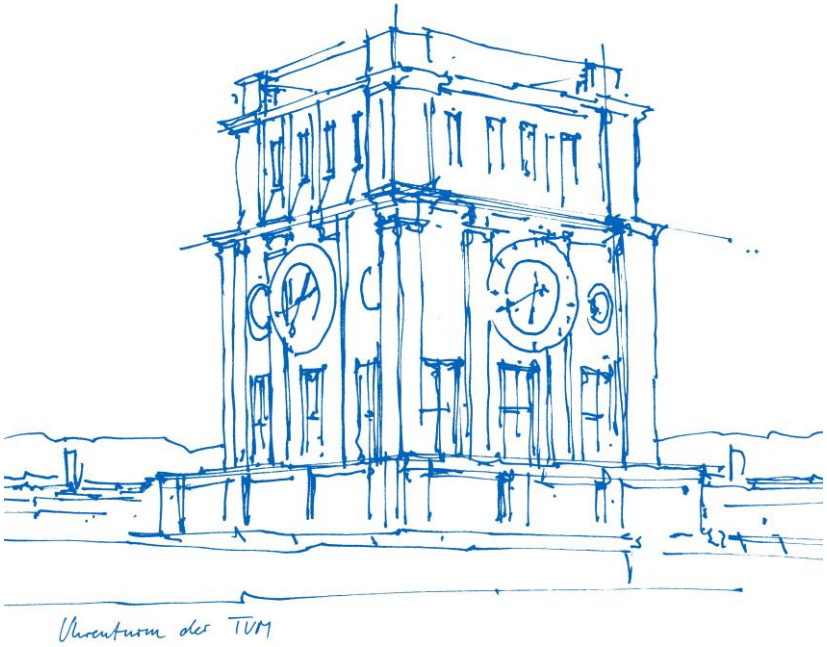
Stimmungsmache mit Fake News und Social Bots – Was tun?

Jürgen Pfeffer

Technical University of Munich

Bavarian School of Public Policy

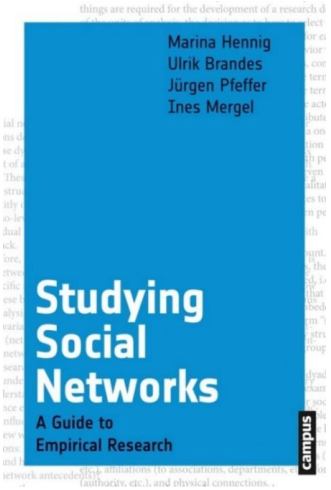
juergen.pfeffer@tum.de | @JurgenPfeffer

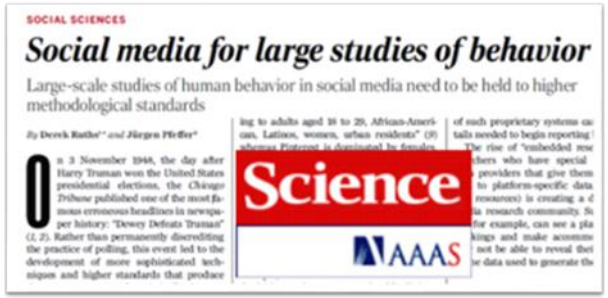


Adjunct Professor

School of Computer Science

Carnegie Mellon University





Vita

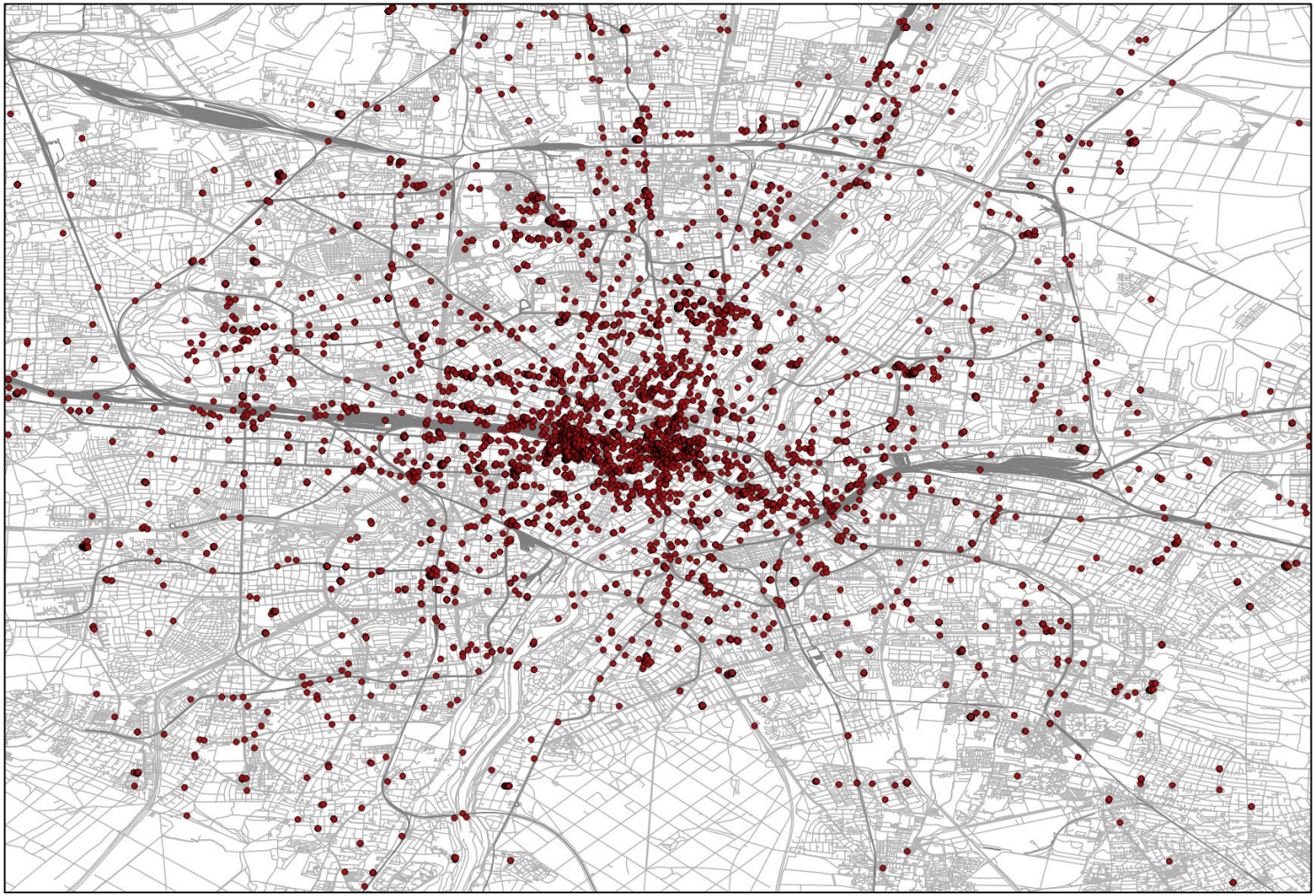
- BA Computer Science, Ph.D. Business Informatics, Vienna University of Technology
- 10 years consulting and non-university research
- 2012-2015: Assistant Professor @ Carnegie Mellon University in Pittsburgh
- 2016- : Professor of Computational Social Science & Big Data @ TU Munich

Research focus

- Computational analysis of organizations and societies
- Special emphasis on large-scale systems, e.g. social media
- Methodological and algorithmic challenges
- Network analysis theories and methods
- Information Visualization

Geo-Codierte Tweets in München

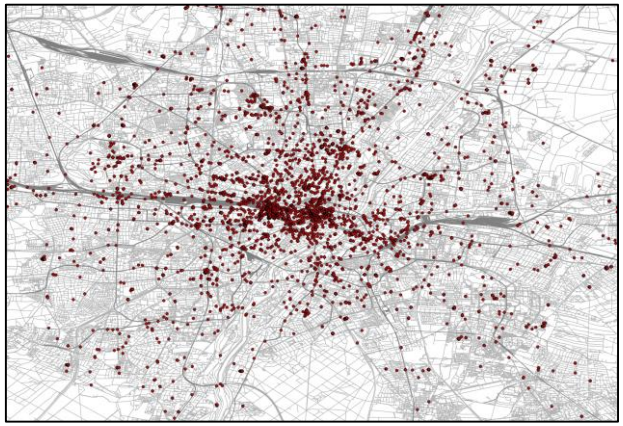
24 Stunden in München



Possible Research Questions?

What topics do people discuss in Munich?

What are new/trending topics?



What about networks?

- Who are the opinion leaders? Are there clusters?
- How does information spread in the city?

Possible Research Questions?

Imagine, you had…

- 100% of ALL Tweets world-wide, ~400 Million/day
- Other social media data
- News articles, reader comments
- Product assessments
- City data: environmental sensors, car sensors, etc.

Motivation

"…access to terabytes of **data describing minute-by-minute interactions** and locations of entire populations of individuals… [will] offer qualitatively new perspectives on **collective human behavior**."

Lazer, D., Pentland, A., Adamic, L., Aral, S., Barabási, A.-L., Brewer, D., Christakis, N., Contractor, N., Fowler, J., Gutmann, M., Jebara, T., King, G., Macy, M., Roy, D., & Van Alstyne, M. (2009). Computational social science. Science, 323, 721-723.

"**Social media** offers us the opportunity for the first time to both observe **human behavior and interaction in real time** *and* on a **global scale**. "

Golder, S. A., & Macy, M. W. (2012, January). Social science with social media. ASA footnotes, 40(1), 7.

Hoffnungen

Direkte Kommunikation

Informationszugang

Partizipartion

Mobilisierung (z.B. Arabischer Frühling)

…

Die dunklen Seiten

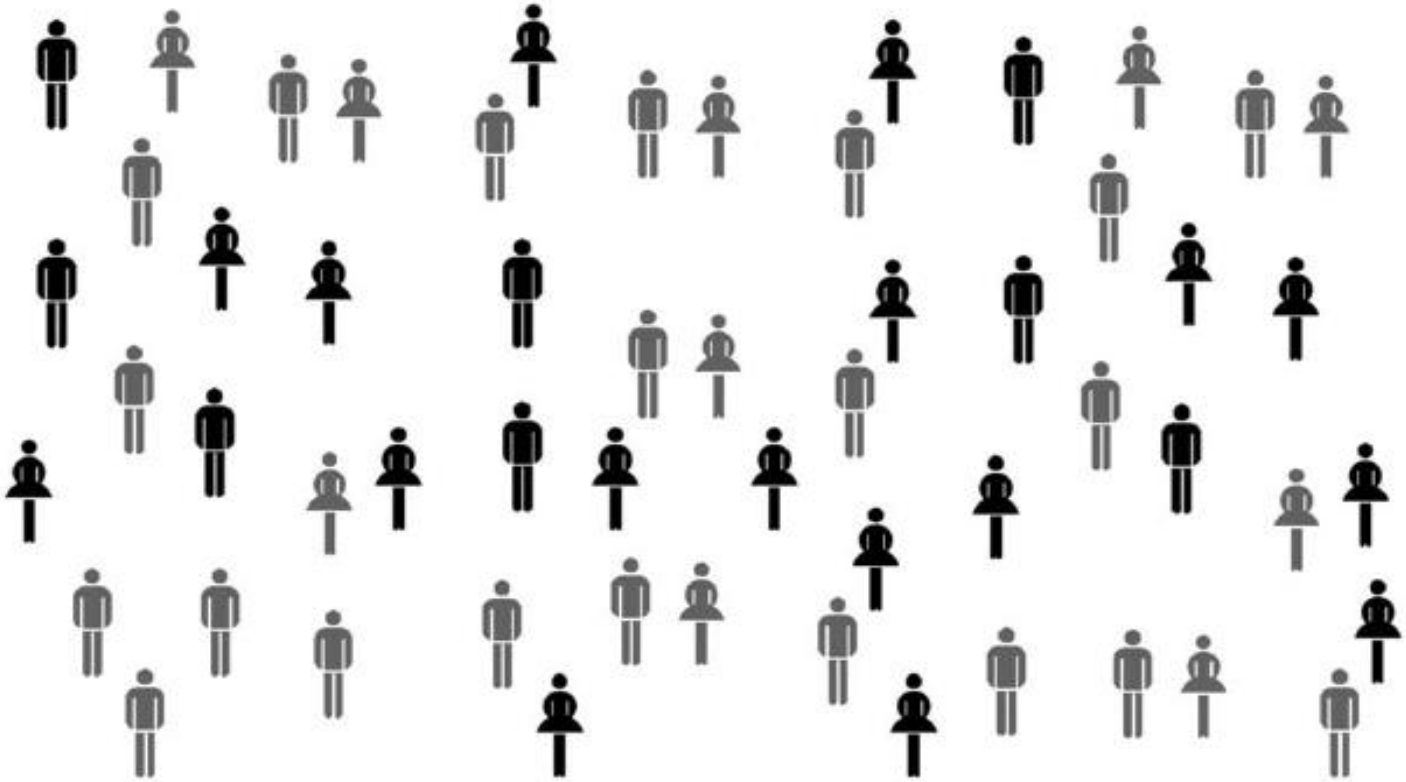
Social Bots

Fake News

Hasspostings

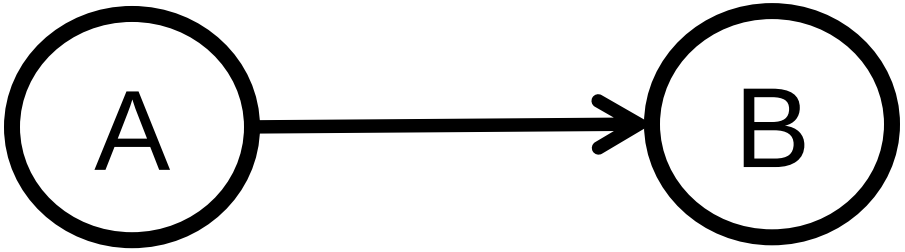
Shitstorms

Ein paar Grundlagen…



People/Connections

Why do people communicate?



Homophily

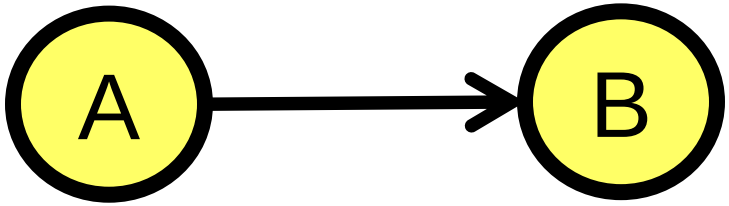
"Birds of a feather flock together"

People link together because of similarities:

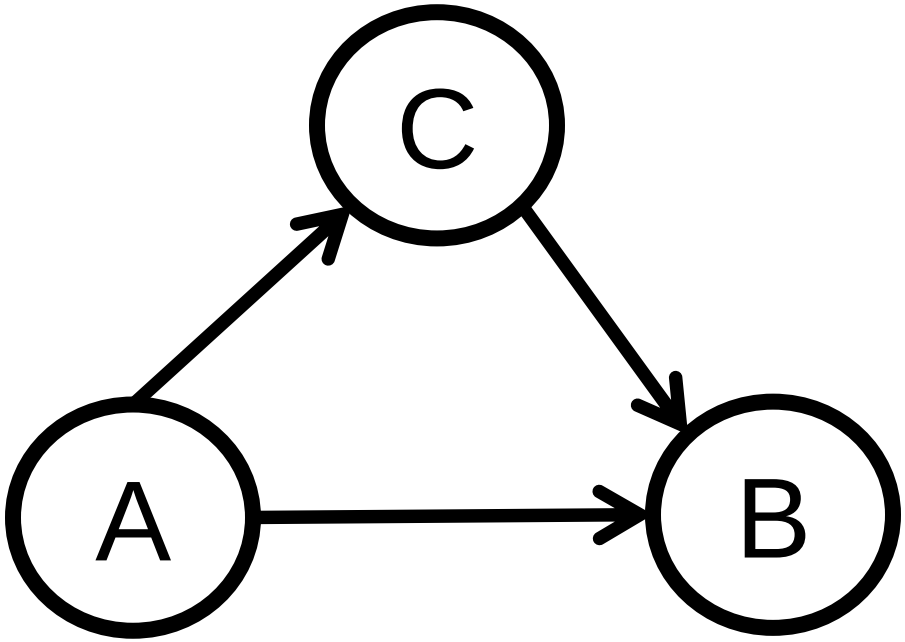
- Common socio-demographic attributes
- Common behaviors, goals, and stories

"Homophily limits people's social worlds in a way that has powerful implications for the information they receive, the attitudes they form, and the interactions they experience."

M. McPherson, L. Smith-Lovin, J. M. Cook, Birds of a Feather:
Homophily in Social Networks. Annual Review of Sociology 27:415-444,2001.



Transitivity

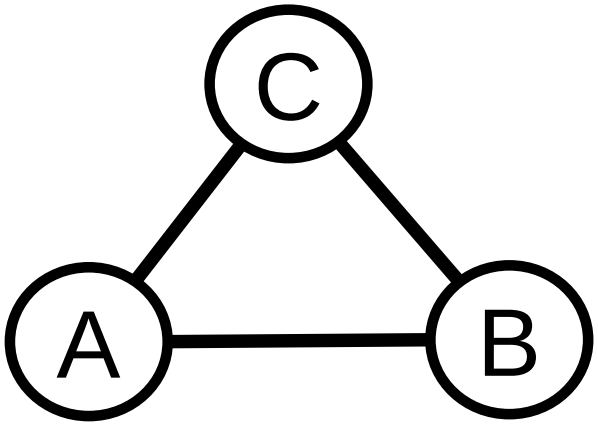


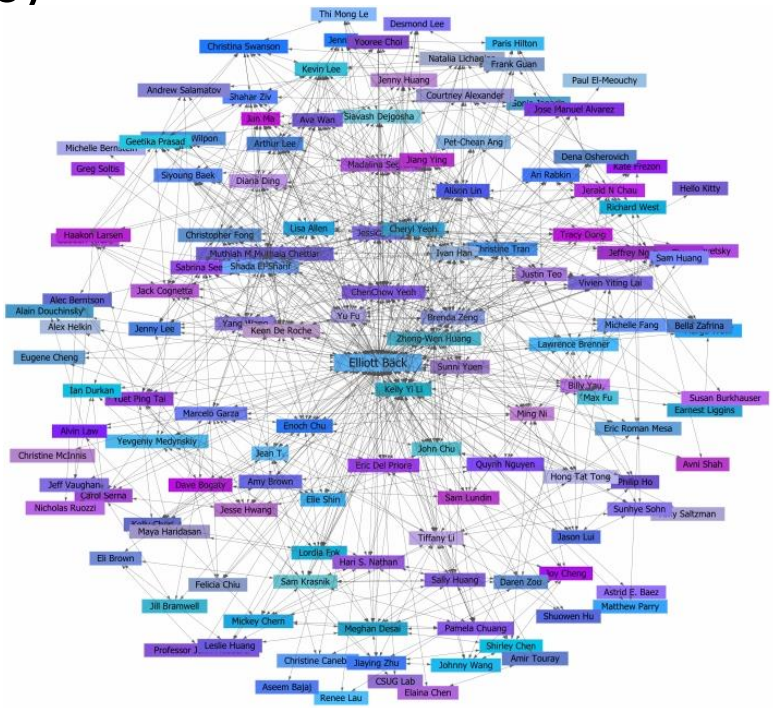
F. Heider, Attitudes and Cognitive Organizations, Journal of Psychology, vol. 21: 107-112, 1946.

Transitivity → Clusters

Interpersonal communication networks have significant local clustering (Pfeffer and Carley, 2011)

Transitive link creations (Heider, 1946)





Was hat das jetzt mit Shitstorms und co. zu tun?

Definition

“An Online Firestorm is a phenomenon that describes the sudden discharge of large quantities of negative word of mouth and complaint behavior against a person, company, or group in social media networks, often paired with intense indignation that has shifted its focus from an actual point of criticism.“

Pfeffer, J. & Zorbach, T. & Carley, K.M. (2013). Understanding online firestorms: Negative word of mouth dynamics in social media networks. Journal of Marketing Communications

Unsettledness in Politics and Business

“Let’s better not say anything. Otherwise, we’ll have an online firestorm tomorrow!”

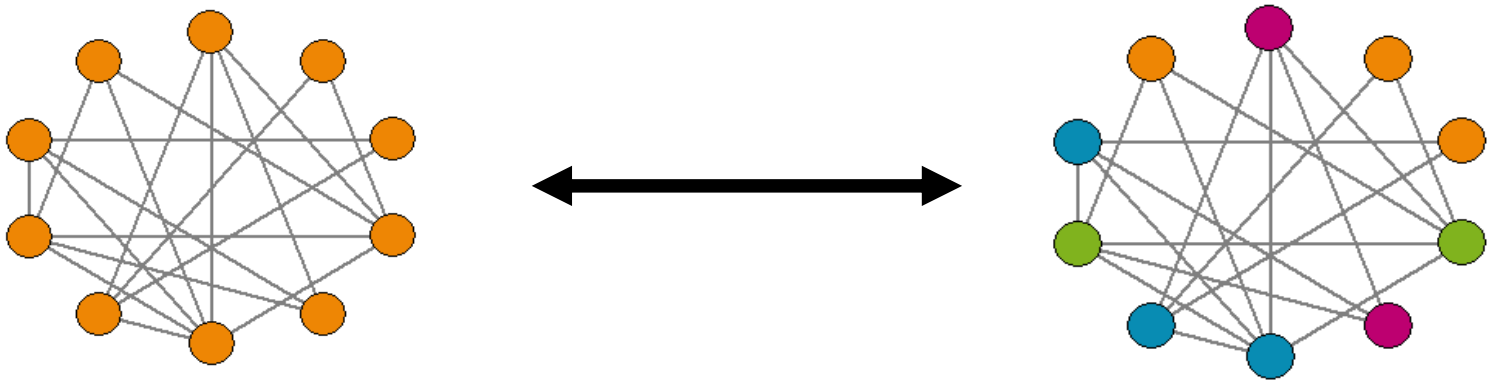
Empirical Observations/Factors

<u>Friends act as information source and as filter</u>

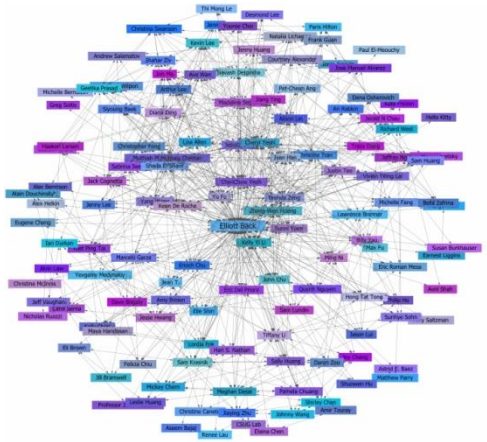
Connections tend to be based on homophily

Technology filters information based on interests/shared friends

Filter bubble (Pariser, 2011) is a concept which refers to over-emphasizing the importance of single topics or opinions



Empirical Observations/Factors



<u>Amplified epidemic spreading, network clusters</u>

1. Average Facebook user Ann: 130 friends
2. Ben posts a very interesting piece of information
3. Ben's friends like what Ben says (Homophily)
4. Ben's friends are also friends with Ann (Transitivity)
5. Ann receive a large amount of posts to one topic
6. Amplifying effects of opinion-forming: echo chambers (Key, 1966)

→ *Network clusters & echo chambers*

Nicht alle User sind Menschen

Was ist ein Bot?

Was ist ein Bot?

Monitoring

Lese Twitter

Warte auf Ereignis

Wenn Tweet
mit @Internettreffen…

Setze Handlung

… dann “like”
oder “re-tweet”

Twitter Daten sammeln

```
import sys, codecs, json
from twython import TwythonStreamer, Twython
from datetime import datetime
from time import time

settings = json.load(open(sys.argv[1]))

class FilterAPI(TwythonStreamer):
    def on_success(self, data):
        dt = datetime.now()
        filename = "data/%s-%s.txt" % (settings['file_prefix'], dt.strftime("%Y-%m-%d"))
        if 'text' in data:
            fp = codecs.open(filename, 'a', 'utf-8')
            fp.write(json.dumps(data)+"\n")
            fp.close()

stream = FilterAPI(settings["APP_KEY"], settings["APP_SECRET"], settings["USER_KEY"],
settings["USER_SECRET"])
stream.statuses.filter(**settings)
```

Diffusion and adoption process

Knowledge **Filter Bubble**

- The agent gets in contact with a new opinion or belief.

Persuasion **Echo Chamber**

- The agent starts to have a positive or negative. Re-infection.

Decision **Binary Choices**

- The opinion or belief is accepted or rejected.

Propagation **Bots**

- The agent starts to actively propagate the opinion or belief. Infection.

Affirmation **Echo Chamber, Bots**

- Positive feedback encourages, negative feedback destabilizes.

→ *Cognitive processes get replaced by network effects!*

Ausblicke/Hypothesen

Wir sind nicht die Kunden, sondern das Produkt

Datafication

Ziel ist Profit, jedes kleine Quiz sammelt Daten

Oder wir sind Risiko: scoring, profiling, usw.

Problem ist Verknüpfung von Daten

Big Data ist Politisch

Daten sprechen nicht von sich aus

Algorithmen sind Abbild der Erzeuger

Problematische Eigentumsverhältnisse von gesellschaftlichen Daten

Private Systeme mit gesellschaftlichen Daten

Geschlossene Systeme

Versteckte Daten

Geheime Algorithmen

Open data/open algorithm

Wissenschaftler könnten Facebook/Twitter helfen

Kann man Bots verhindern/verbieten?

Nein

Es wird sie geben

Weil sie einfach zu erzeugen sind

Können Bots Wahlen beeinflußen? Nein, aber…

Polarisierung → Radikalisierung

Social Media wäre (fast) nichts ohne “Media”

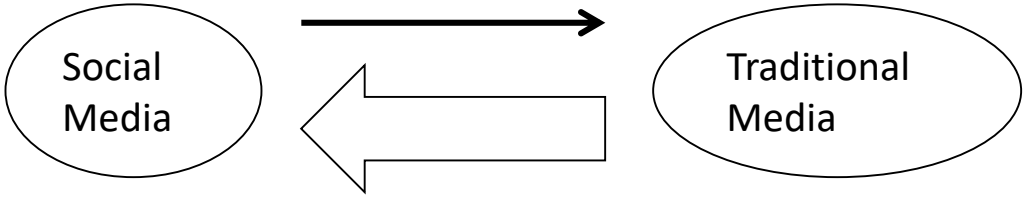
Soziale Medien sind wichtig! … Aber…

Social media als wichtige Informationsquelle traditioneller Medien

Twitter als “Radar”

Social media “hooks” erleichtern Verbreitung

→ *Cross Media Dynamiken*



Fakten-Checken ist Medienarbeit

Fake News sind ein Problem …

… das nicht neu ist und

… gegen das man fast nichts tun kann

Fakten (richtig oder falsch) ändern keine Meinungen

- Motivated reasoning
- Menschen suchen nach bestätigender Information
- Klimawandel, Impfungen, etc.

Nicht Post-Fact sondern Post-Trust

Traditionellen Autoritäten/Institutionen wird nicht mehr geglaubt

Peer production als neuer Vertrauensweg

Wissen wird in Interaktion konstruiert

Wirkungsweise

Manipuliert werden hauptsächlich Medien/Wahrnehmung

Wahrnehmung verzerren, z.B. Rankings

Verhalten vieler oder Manipulation weniger?

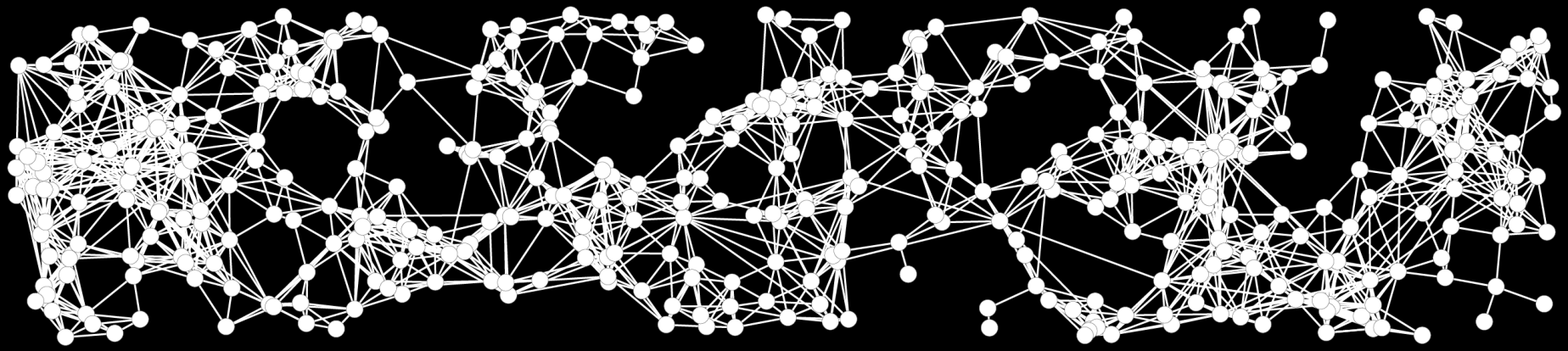
Relativierung, was diese Daten sind und was nicht

Zusammenfassung

- Verantwortung: Druck auf FB erhöhen
- Hinter allem stehen Menschen - keine neutrale Technologien
- Transparenz - open Data/Algorithmen
- Wirtschaftliche Hintergründe
- Handlungskompetenz - Wahrnehmung, Vertrauen; aktiv erarbeite

“Our mission is to go forward, and it has only just begun. There's still much to do, still so much to learn. Engage!”

Jean-Luc Picard, Star Trek TNG, Season 1 Episode 26



Jürgen Pfeffer
Juergen.Pfeffer@tum.de
@JurgenPfeffer