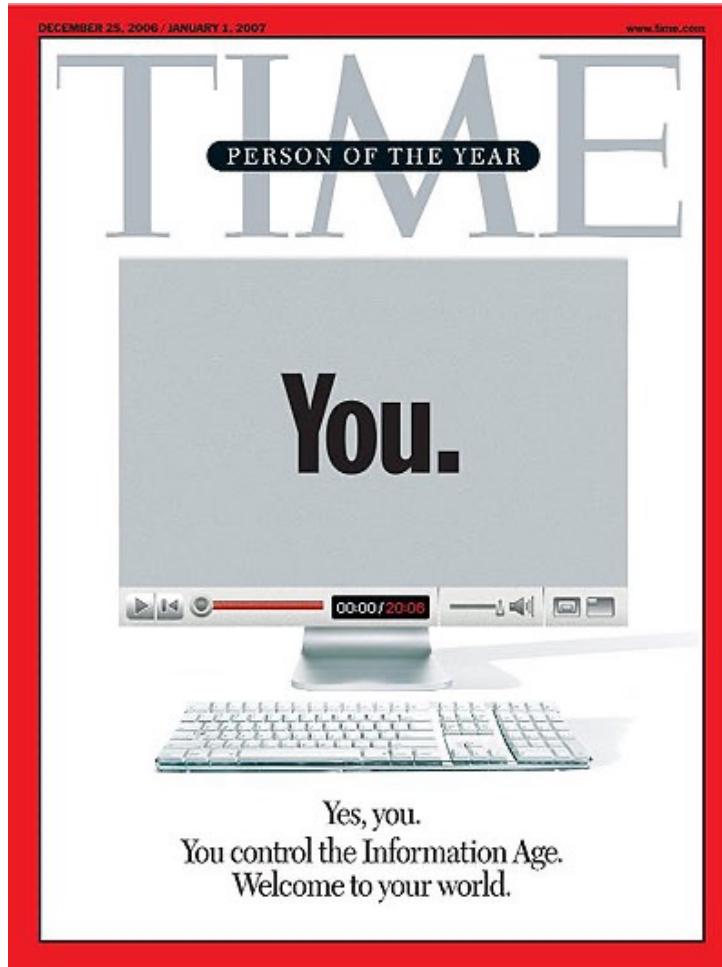


computational social media

lecture 1: introduction (part 1)

daniel gatica-perez

this course



2006

http://en.wikipedia.org/wiki/File:Time_youcover01.jpg



2010

http://content.time.com/time/specials/packages/article/0,28804,2036683_2037183_2037185,00.html



2016

<https://imgur.com/gallery/mUfbBfn>



TIME

2018

<https://www.youtube.com/watch?v=CMZTbMFK5eA>

Facebook's Oversight Board to Decide on Trump Ban

Facebook has to decide whether to give the ex-president his bullhorn back. It won't make that call itself.



In 2019, then president Donald Trump met with Mark Zuckerberg at the White House. PHOTOGRAPH: ALAMY

2021

<https://www.wired.com/story/facebook-oversight-board-decide-trump-ban/>



2022

<https://about.fb.com/news/2021/10/facebook-company-is-now-meta/>

today

let's hear from you

course goals, syllabus, evaluation, logistics

setting the stage: who studies social media?

how did we get here?

the triple revolution and networked individualism



please introduce yourself

- * share a few words about yourself and your background

goals of the course

present a **human-centered** view of social media

provide a coherent historical & conceptual background for **multidisciplinary research** on social media: media studies, HCI, machine learning, multimedia, network science

present **fundamentals** to understand motivations & analyze phenomena in Facebook, Twitter, YouTube, Instagram (and Flickr, Foursquare)

critique seminal research

develop hands-on experience with **homeworks & student projects**



definition of social media

“a group of internet-based applications that build on the **ideological and technological** foundations of Web 2.0, and that allow the creation and exchange of **user-generated content**””



types of social media (in theory)

social network sites (SNSs):

“promote interpersonal contact;
forge personal, professional, or geographic connections”
Facebook, Twitter, LinkedIn, Google+, Foursquare

user-generated content (UGC):

“support creativity and foreground cultural activity;
promote exchange of amateur or professional content”
YouTube, Instagram, Flickr, Pinterest, Vine, Wikipedia

trading and marketing sites (TMSs):

“support exchange and sales of products”
Amazon, eBay, GroupOn, Craigslist, Etsy

play and gaming sites (PGSs):

“social games”
FarmVille, Angry Birds

types of social media (in practice)



Van Dijck: “the entire ecosystem of interconnected platforms and applications has been in flux and will remain volatile”

who studies social media?

computer science & engineering
psychology
sociology
communication
economics
law
management
marketing



computational social media

computer science
and engineering



Use social media data for CS problems

- natural language processing
- text mining
- computer vision and multimedia
- network science, graph theory
- machine learning
- human-computer interaction

Automate tasks for social media analysis

- sentiment analysis
- user modeling
- social network analysis
- social search & recommendation
- misinformation detection

Systems: volume, variety, velocity, complexity

- storage
- management
- sharing
- streaming

computational **social** media

psychology
sociology
communication
economics
law
political science
digital humanities

Use social media as traces to study behavior in everyday life

- Friendship
- Communities
- Influence
- Mobility

Study phenomena within social media sites and communities

Computational social science



social media as a lens of society

“new opportunities to study human behavior that previously had to rely in **behaviors difficult to assess** (like making friends and chatting)”

“measurable behavioral traces with levels of **ecological validity** that are hard to match in most common research settings”

“the popularity of [social media] makes it a topic worthy of study **in its own right**”

“in addition to **reflecting** existing social processes, they are **spawning** new ones by changing the way people relate to one another”

“the rise of [social media] brings both new **benefits** and **dangers** to society”



DeGolyer Library, Southern Methodist University @ flickr (cc)
<https://www.flickr.com/photos/41131493@N06/6863317608/>

Computational Social Science

David Lazer,¹ Alex Pentland,² Lada Adamic,³ Sinan Aral,^{2,4} Albert-László Barabási,⁵ Devon Brewer,⁶ Nicholas Christakis,¹ Noshir Contractor,⁷ James Fowler,⁸ Myron Gutmann,³ Tony Jebara,⁹ Gary King,¹ Michael Macy,¹⁰ Deb Roy,² Marshall Van Alstyne^{2,11}

We live life in the network. We check our e-mails regularly, make mobile phone calls from almost any location, swipe transit cards to use public transportation, and make purchases with credit cards. Our movements in public places may be captured by video cameras, and our medical records stored as digital files. We may post blog entries accessible to anyone, or maintain friendships through online social networks. Each of these transactions leaves digital traces that can be compiled into comprehensive pictures of both individual and group behavior, with the potential to transform our understanding of our lives, organizations, and societies.

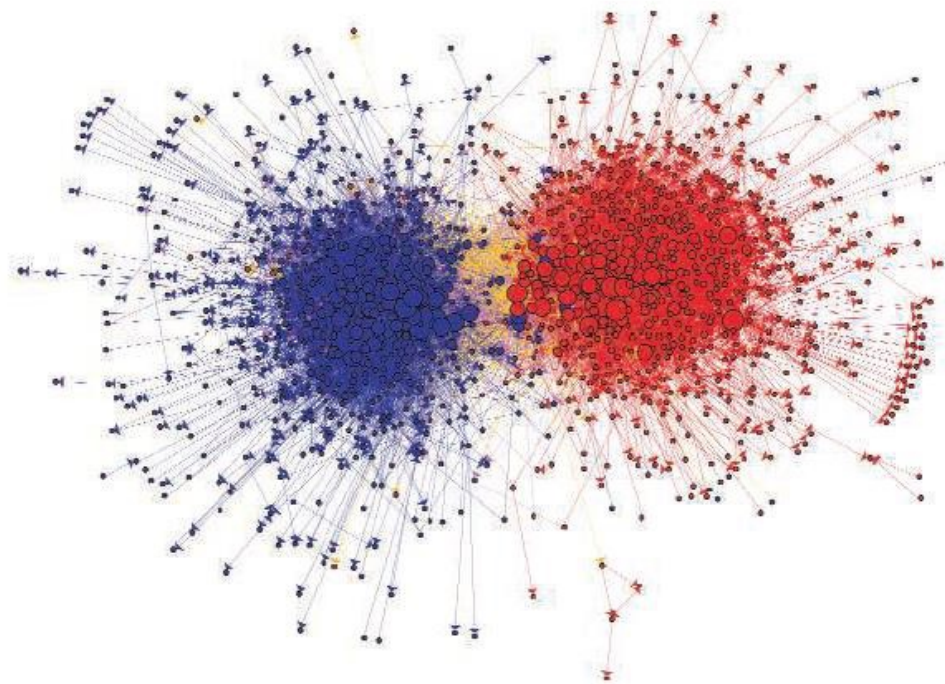
The capacity to collect and analyze massive amounts of data has transformed such fields as biology and physics. But the emergence of a data-driven “computational social science” has been much slower. Leading journals in economics, sociology, and political science show little evidence of this field. But computational social science is occurring—in Internet companies such as Google and Yahoo, and in govern-

ment agencies such as the U.S. National Security Agency. Computational social science could become the exclusive domain of private companies and government agencies. Alternatively, there might emerge a privileged set of academic researchers presiding over private data from which they produce papers that cannot be

A field is emerging that leverages the capacity to collect and analyze data at a scale that may reveal patterns of individual and group behaviors.

critiqued or replicated. Neither scenario will serve the long-term public interest of accumulating, verifying, and disseminating knowledge.

What value might a computational social science—based in an open academic environment—offer society, by enhancing understanding of individuals and collectives? What are the



Data from the blogosphere. Shown is a link structure within a community of political blogs (from 2004), where red nodes indicate conservative blogs, and blue liberal. Orange links go from liberal to conservative, and purple ones from conservative to liberal. The size of each blog reflects the number of other blogs that link to it. [Reproduced from (8) with permission from the Association for Computing Machinery]

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credit:
Science

computational social media

communication
media studies
marketing
management



Effects of social media in other media production and consumption

- News
- Citizen journalism
- Entertainment

Marketing

- Attention
- Virality
- Branding

Corporate communication

- Community management
- Reputation management

example: topics in AAAI ICWSM

Int Conf. on Web and Social Media: <https://www.icwsm.org/2022/index.html>

Studies of digital humanities (culture, history, arts) using social media
Psychological, personality-based and ethnographic studies of social media
Analysis of the relationship between social media and mainstream media
Qualitative and quantitative studies of social media
Centrality/influence of social media publications and authors
Ranking/relevance of social media content and users
Credibility of online content
Social network analysis; communities identification; expertise discovery
Trust; reputation; recommendation systems
Human computer interaction; social media tools; navigation and visualization
Subjectivity in textual data; sentiment analysis; polarity/opinion extraction
Text categorization; topic recognition; demographic/gender/age identification
Trend identification and tracking; time series forecasting
Measuring predictability of real world phenomena spanning politics, finance, health
New social media applications; interfaces; interaction techniques
Engagement, motivations, incentives, and gamification
Social innovation and effecting change through social media
Social media usage on mobile devices; location, human mobility, and behavior
Organizational and group behavior mediated by social media
Interpersonal communication mediated by social media

course syllabus



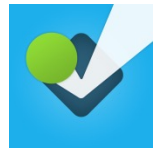
Friending. Human-centered Facebook research. Users, communities, and networks. The real-name web



Tweeting. Followers, hashtags, topics, events. Analyzing phenomena: from information diffusion to misinformation



Shooting. Photo sharing. Flickr, Instagram, Snapchat
Media, user, community analysis enabled by photo sharing



Moving. Location-based social networks.
Large-scale phenomena revealed by mobility data



Watching. YouTube as a media phenomenon. Video blogging.
Video analysis techniques



Crowdsourcing. Crowdsourcing and social participation
Uses in social media research. Crowdsourcing models



Burn out. Effects on society: privacy, fairness, and the future

course activities

lectures

- + instructor: Daniel Gatica-Perez
- + teaching assistants: Lakmal Meegahapola, Sina Sajadmanesh
- + session 10:15-12:00: lectures
- + session 12:15-13:00: papers, assignments, projects

paper presentation and discussion

- + student presentations of papers that complement lectures
- + discussion sessions: analyze & critique papers
- + 2 roles: presenter & discussant
- + 10 papers to discuss

homeworks

- + qualitative work: reflect about social media phenomena
- + quantitative work: analyze social media data
- + 4-5 assignments

project

- + developed throughout the semester
- + work in small teams (3 students per team)
- + presentations and report will be used for evaluation

course evaluation

homeworks (40%)

paper presentation & participation in discussion (15%)

project (45%)

communication

course moodle

- + lectures; homeworks; papers; grades
- + announcements and other interactions

lectures

- + slides shared on **moodle** before lecture
- + video lectures from 2021 available on **switchtube** channel

office hours

- + email: daniel.gatica-perez@epfl.ch, lakmal.meegahapola@epfl.ch, sina.sajadmanesh@epfl.ch
- + meetings by appointment

papers and homeworks

- + announced in class
- + please participate in the paper discussions !

project

- + you will decide the specific topic early on
- + we will monitor progress: mid-term progress presentation
- + final presentation & final report at end of semester

questions?

daniel.gatica-perez@epfl.ch