l'informatique sociale au gymnase

daniel gatica-perez

25.03.2023

idiap RESEARCH INSTITUTE

EPFL

OR

i was asked to talk about a topic i don't know much about

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25.03.2023

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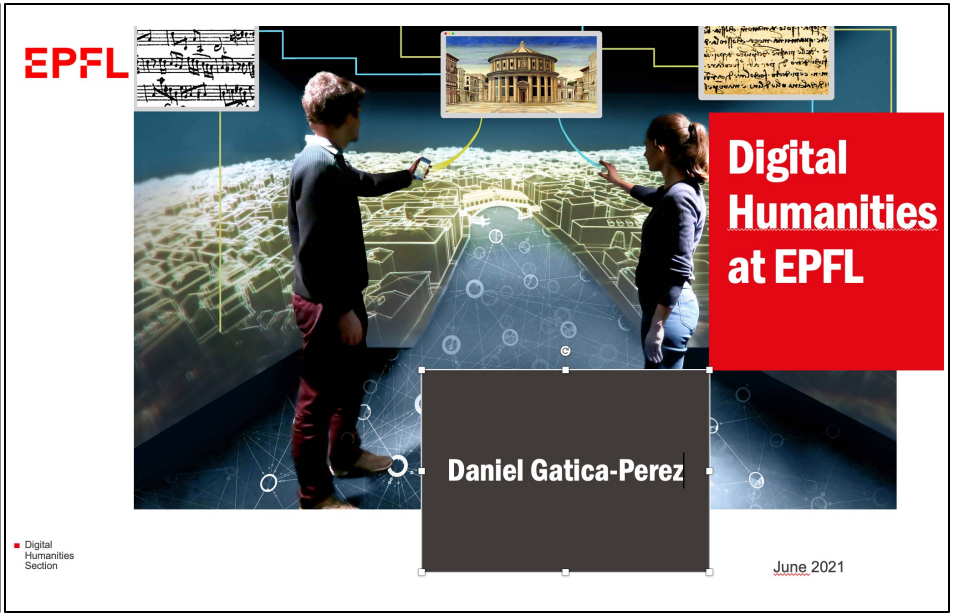
two events
(organized by EPFL Service de Promotion des Etudes)

Why the Digital Humanities Need You

Daniel Gatica-Perez

15.11.2019



Semaine d'études DH @ EPFL
Fondation *Science et jeunesse*
Gymnasiens from all over Switzerland
Students working for one week in a lab
~60 students

Summer School @ EPFL
Gymnase Lerbermatt, Köniz (BE)
OS: physique-math, biologie-chimie
Students spent one week at EPFL
~30 students

Informatique

Discipline obligatoire en 1re et 2e année

Pendant les deux années consacrées à ce domaine scientifique, l'élève développe des compétences dans le domaine de la pensée computationnelle avec de l'algorithmique et de la programmation.

Dans une perspective citoyenne, l'élève est amené à développer un regard informé face aux technologies numériques et à la façon dont elles reconfigurent de nombreuses dimensions de la société, telles que les relations sociales, la vie privée, les sphères politiques et économiques, la culture ou les médias.

La première année propose d'acquérir des connaissances et des notions générales sur le fonctionnement des ordinateurs et sur la représentation des données. L'élève développe des compétences liées à la programmation et à la pensée computationnelle.

En deuxième année, l'élève consolide ses connaissances en programmation avec de la mise en pratique dans des sujets comme les réseaux, la modélisation et la simulation. Il réalise un projet en apprenant à organiser son travail et ses apprentissages de manière autonome.

digital humanities as a motivation for computing

LEONARDO'S LAPTOP

HUMAN NEEDS AND THE NEW COMPUTING TECHNOLOGIES

Ben Shneiderman

2002

Google leonardo

All Images Maps News Videos More Settings Tools Collections SafeSearch

titanic cheers hair hairstyle tom hardy catch me if you can rena


Leonardo DiCaprio - W...
en.wikipedia.org


Leonardo DiCaprio Called Out f...
indiewire.com


Leonardo DiCaprio | Bi...
britannica.com


Leonardo DiCaprio to donate 5 million ...
indiatoday.in


Leonardo DiCaprio's Evolution of Look...
youtube.com


Leonardo DiCaprio to reportedly play 24 ...
cbsnews.com

3 days ago
Cole Sprouse mocks Brad Pitt and ...
metro.co.uk


Leonardo DiCaprio Films, Ranked ...
manofmany.com


How TIME 100's Leonardo DiCap...
time.com

Music

Culture or Technology ?

The world is complex. Think like a DH Engineer.

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EFPL DIGITAL HUMANITIES MASTER.
The Power of Data. The Depth of Culture.

Museums

Culture or Technology ?

The world is complex. Think like a DH Engineer.

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Artificial Intelligence

Culture or Technology ?

The world is complex. Think like a DH Engineer.

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The Power of Data. The Depth of Culture.

Social Media

Culture or Technology ?

The world is complex. Think like a DH Engineer.

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The Power of Data. The Depth of Culture.

social media as an example of computing

Computational Social Media

Télécharger la fiche de cours (PDF)

DH-500 / **4 crédits**

Enseignant: Gatica-Perez Daniel

Langue: Anglais

Withdrawal: It is not allowed to withdraw from this subject after the registration deadline.

Summary

The course integrates concepts from media studies, machine learning, multimedia and network science to characterize social practices and analyze content in sites like Facebook, Twitter and YouTube. Students will learn computational methods to infer individual and networked phenomena in social media.

Dans les plans d'études

Humanités digitales
2022-2023 Master semestre 2

- **Semestre:** Printemps
- **Forme de l'examen:** Pendant le semestre (session d'été)
- **Matière examinée:** Computational Social Media
- **Cours:** 2 Heure(s) hebdo x 14 semaines
- **TP:** 1 Heure(s) hebdo x 14 semaines

Humanités digitales
2022-2023 Master semestre 4

Humanités digitales
2022-2023 Ecole doctorale

example of content

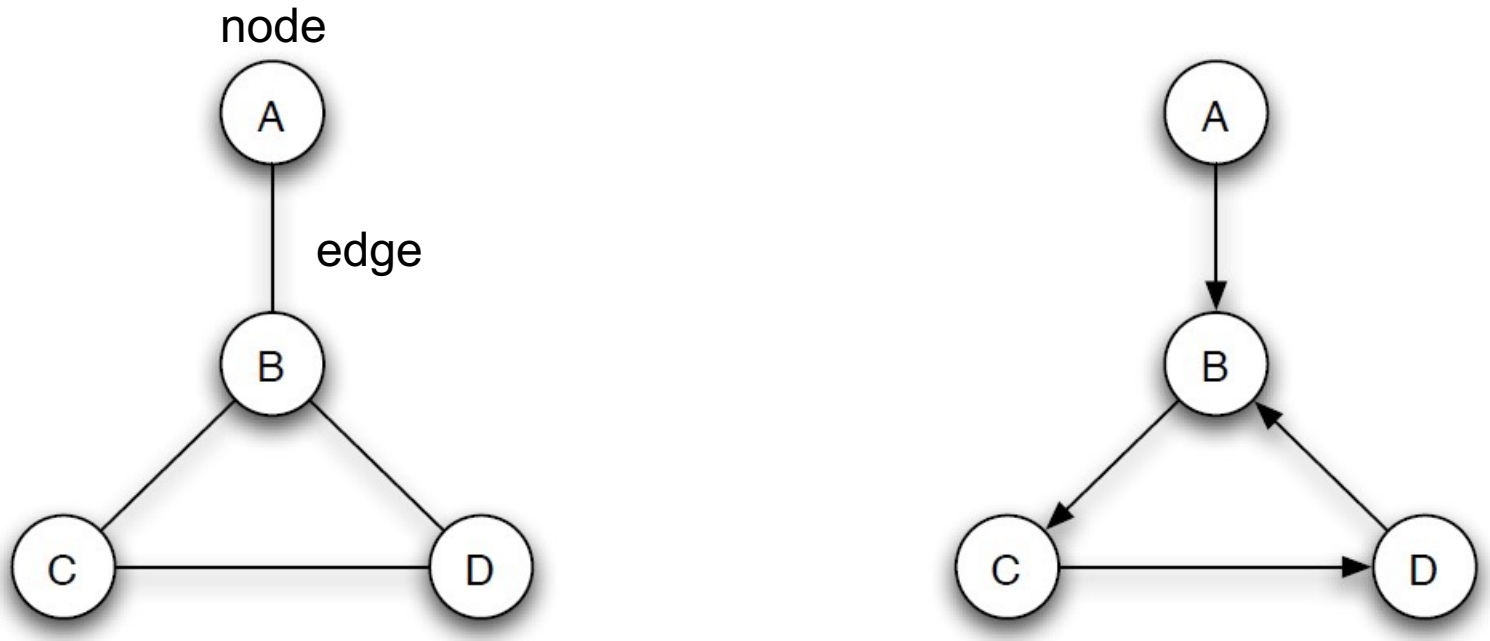
graphs as models of networks

the anatomy of the facebook graph

social grooming

graphs as models of networks

D. Easley and J. Kleinberg. Networks, Crowds, and Markets: Reasoning about a Highly Connected World. Cambridge University Press, 2010. Chapter 2, http://www.cs.cornell.edu/home/kleinber/networks-book/



(a) *A graph on 4 nodes.*

(b) *A directed graph on 4 nodes.*

Figure 2.1: Two graphs: (a) an undirected graph, and (b) a directed graph.

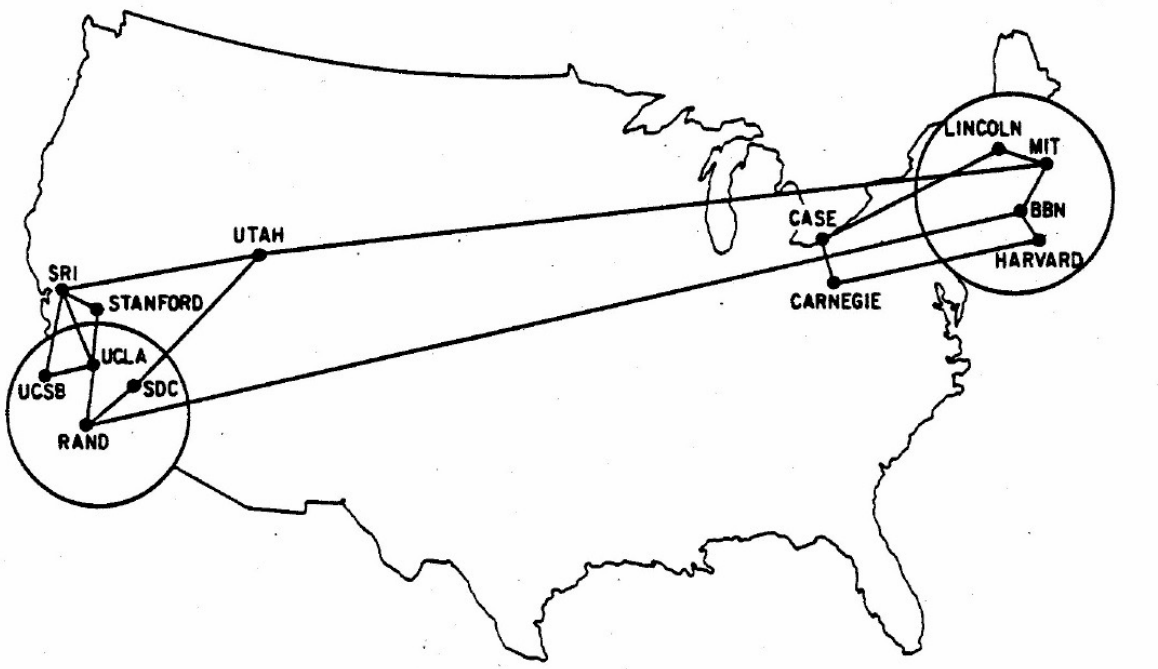


Figure 2.2: A network depicting the sites on the Internet, then known as the Arpanet, in December 1970. (Image from F. Heart, A. McKenzie, J. McQuillian, and D. Walden [214]; on-line at http://som.csudh.edu/cis/lpress/history/arpamaps/.)

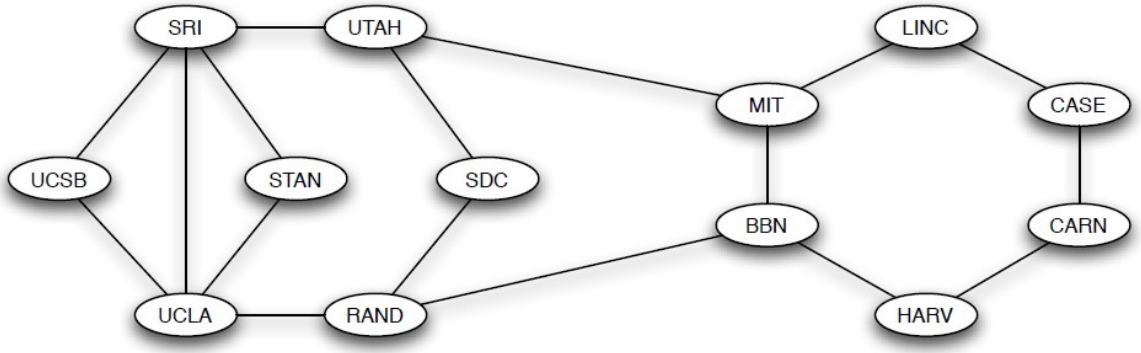


Figure 2.3: An alternate drawing of the 13-node Internet graph from December 1970.

paths and cycles

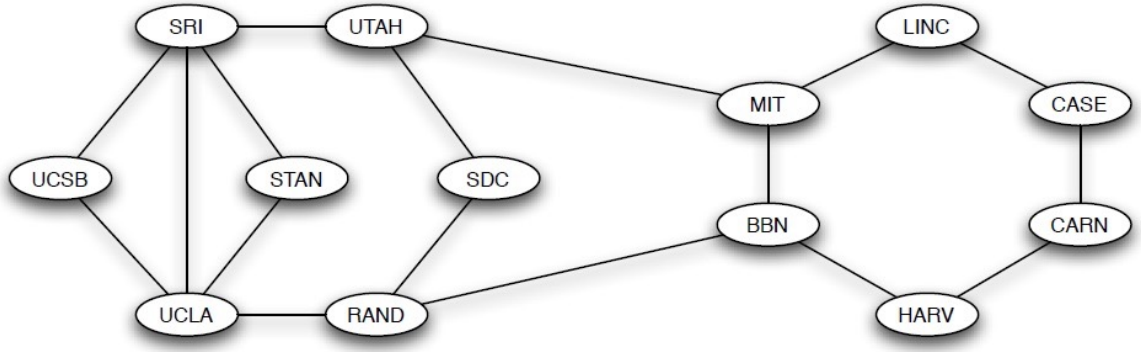


Figure 2.3: An alternate drawing of the 13-node Internet graph from December 1970.

Path: sequence of nodes where each consecutive pair is connected by an edge

Simple path: paths that contain no repeated nodes

Cycle: a path with at least three edges, in which the first and last nodes are the same, but otherwise all nodes are distinct

connectivity

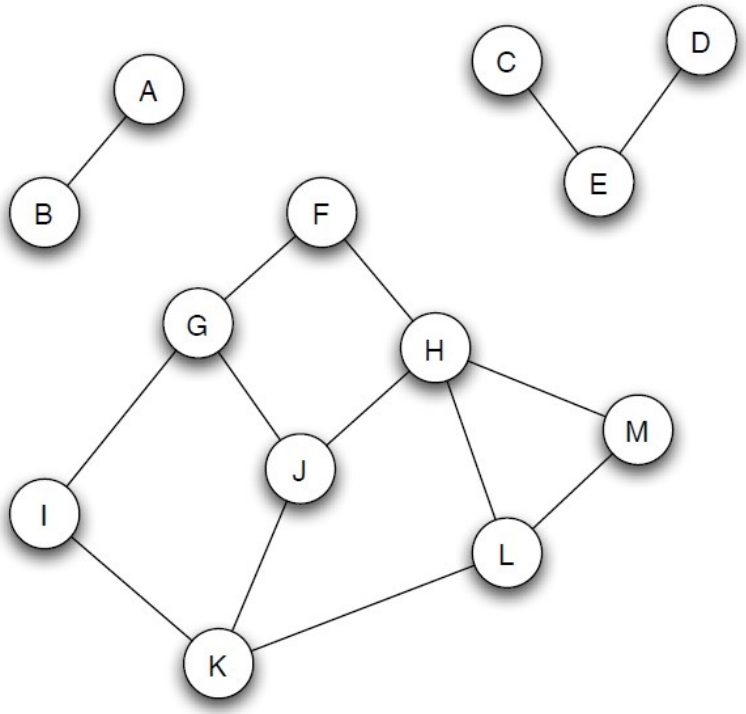


Figure 2.5: A graph with three connected components.

Connected component: a subset of the nodes such that:

(i) every node in the subset has a path to every other;

(ii) the subset is not part of some larger set with the property that every node can reach every other.

(i) says that the component is internally connected

(ii) says that the component is a free-standing piece of the graph

giant components

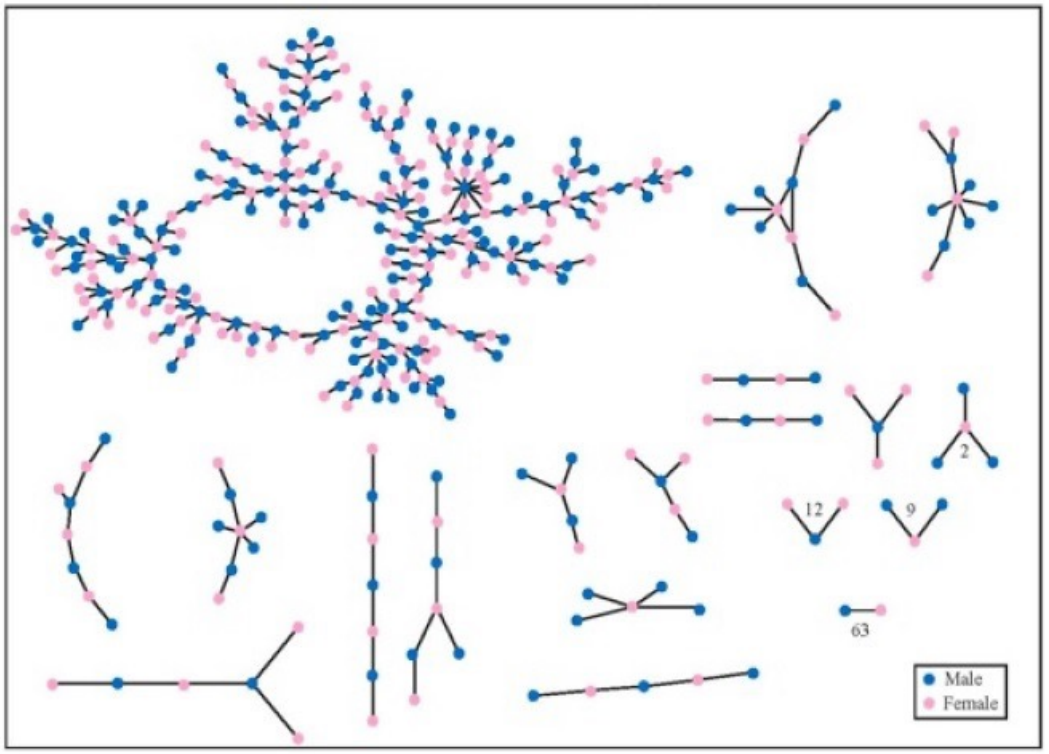


Figure 2.7: A network in which the nodes are students in a large American high school, and an edge joins two who had a romantic relationship at some point during the 18-month period in which the study was conducted [49].

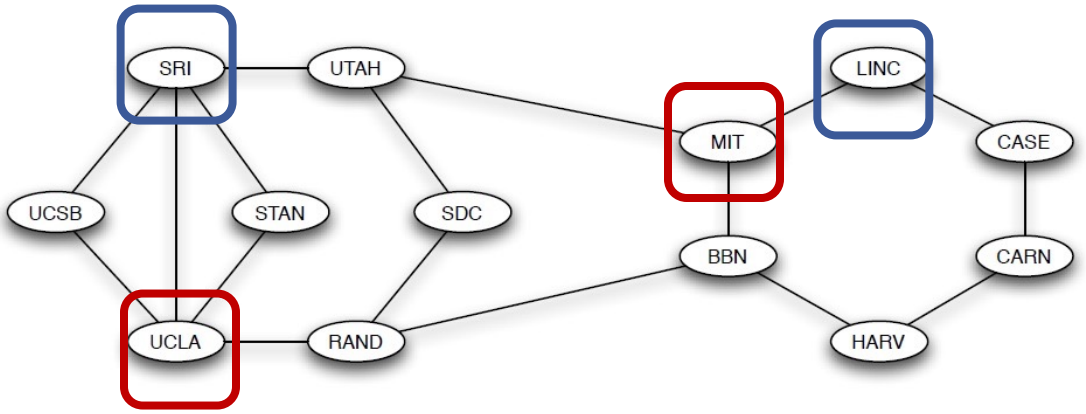
Giant component: connected component that contains a significant fraction of all the nodes in large networks

When a network contains a giant component, it almost always contains only one

path length and distance between nodes

Path length (l): number of edges in the sequence of nodes that comprises it

Distance between two nodes (d): length of the shortest path between the nodes



l(MIT, BBN, RAND, UCLA) = 3

d(LINC, SRI) = 3

sharing research results with students: the anatomy of the facebook social graph

how is the facebook social graph structured?
(Backstrom et al. 2011)

721 million facebook users
69 billion friendships
largest social network ever studied

https://www.facebook.com/data

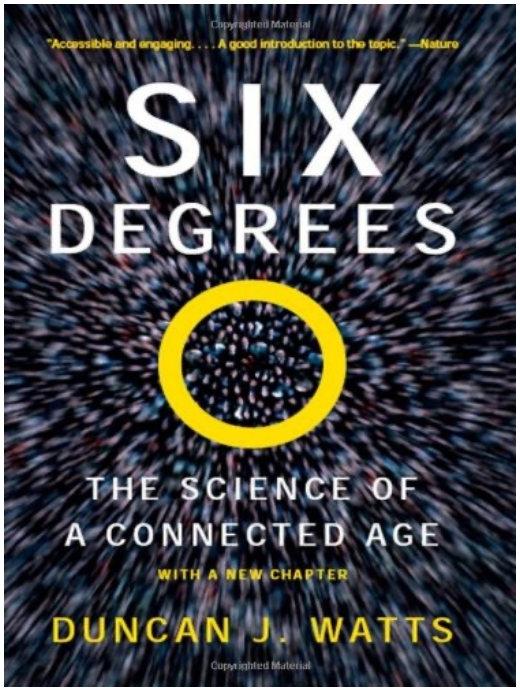
research questions:

1. how many friends do people have?
2. how many intermediaries are there between any two users?

L. Backstrom, Anatomy of Facebook, 21.11.2011
http://www.facebook.com/notes/facebook-data-team/anatomy-of-facebook/10150388519243859

L. Backstrom, P. Boldi, M. Rosa, J. Ugander, S. Vigna, Four Degrees of Separation, in Proc. ACM Int'l Conf. on Web Science (WebSci), Jun. 2012, http://arxiv.org/abs/1111.4570
J. Ugander, B. Karrer, L. Backstrom, C. Marlow, The Anatomy of the Facebook Social Graph, Nov. 2011, http://arxiv.org/abs/1111.4503

the small-world phenomenon



six degrees of separation

+ any two people are separated by no more than six intermediate connections
+ the world looks "small" given these short paths
+ proposed by Frigyes Karinthy in short story (1929)
+ popularized by John Guare's *Six Degrees of Separation* play (1990)

Stanley Milgram's small-world experiment (1960s)

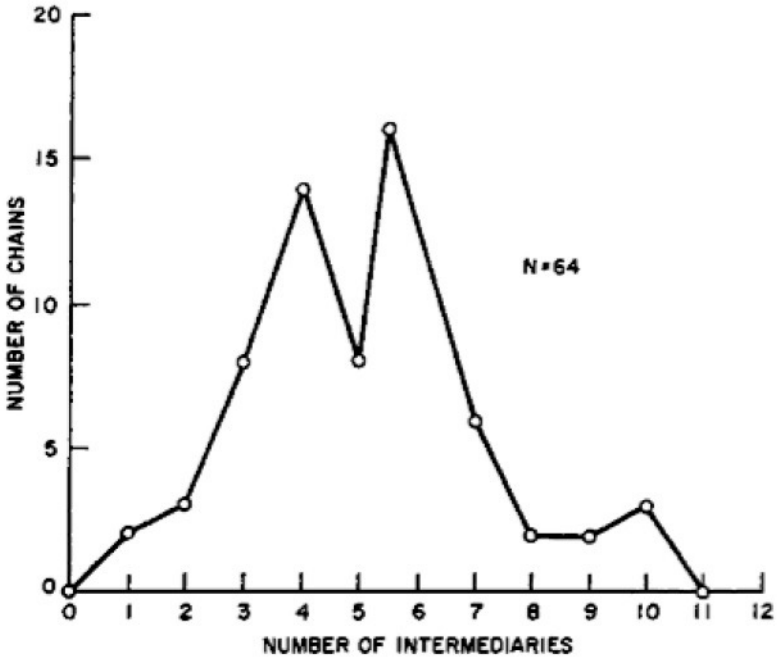
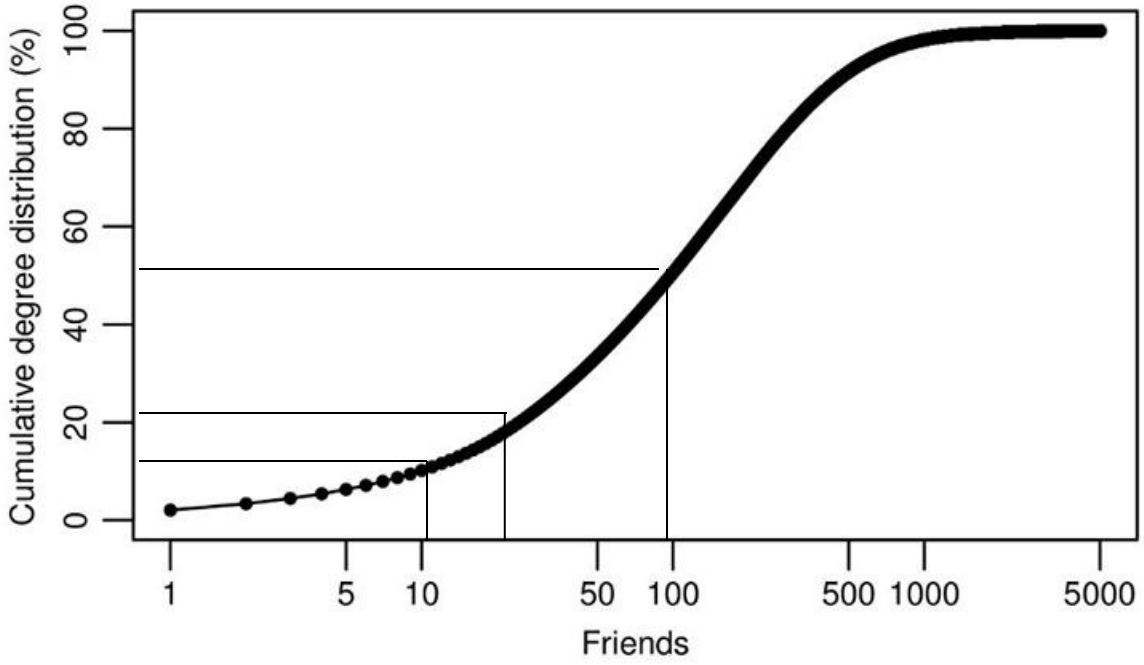


Figure 2.10: A histogram from Travers and Milgram's paper on their small-world experiment [391].

+ 296 volunteers living in US midwest
+ they sent a message to a target (a specific person living in Boston suburbs)
+ volunteers could not send message directly to the target (unless they were a personal contact)
+ they sent message to a personal contact who was likely to know the target
+ 64 chains reached the target
+ mean **number of intermediate persons** = 5.2 (**distance** = 6.2)

people navigate short paths with success, even if entire network is not visible

how many friends do people have on facebook?
(Backstrom et al. 2011)



cumulative degree distribution: % of people with less than X friends

10% of people: less than 10 friends

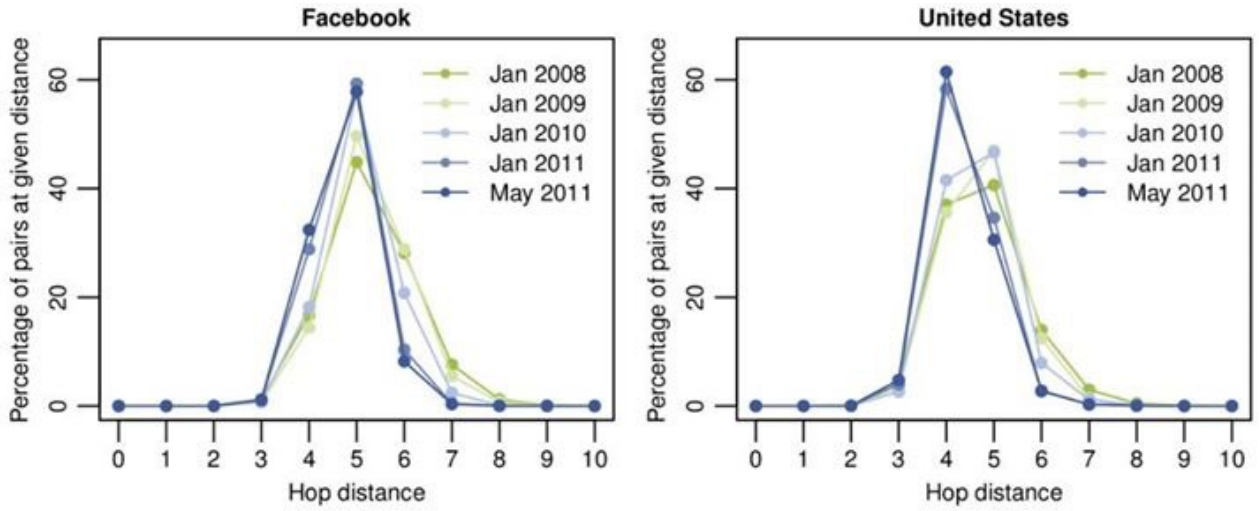
20% of people: less than 25 friends

50% (the median): less than 100 friends

average friend count = 190

4 degrees of separation

(Backstrom et al. 2011) (degrees of separation = intermediaries = distance-1)



average distance (2008) = 5.28
average distance (2011) = 4.74

within same country, connectivity is even higher

84% of all connections are between users in the same country

social grooming

social grooming

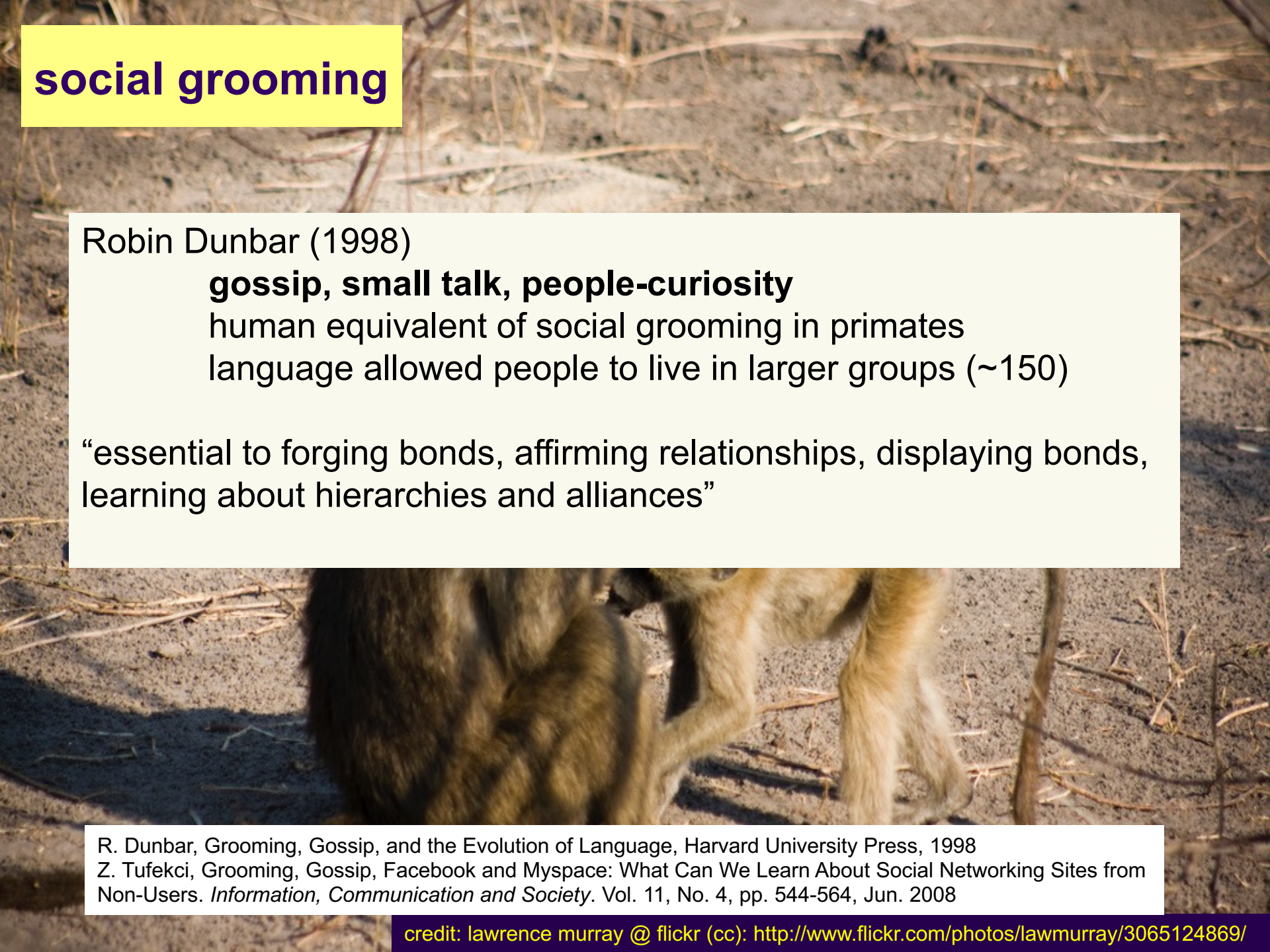
Robin Dunbar (1998)

gossip, small talk, people-curiosity

human equivalent of social grooming in primates

language allowed people to live in larger groups (~150)

“essential to forging bonds, affirming relationships, displaying bonds, learning about hierarchies and alliances”

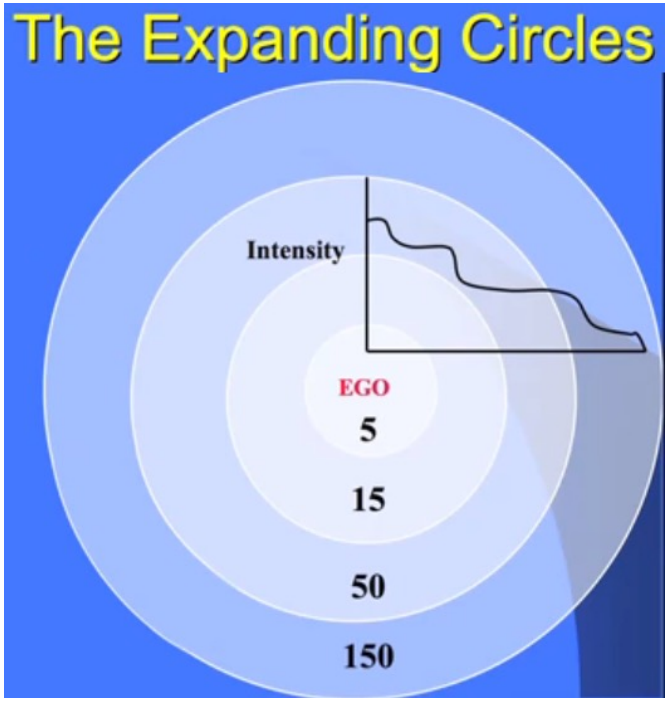


R. Dunbar, Grooming, Gossip, and the Evolution of Language, Harvard University Press, 1998
Z. Tufekci, Grooming, Gossip, Facebook and Myspace: What Can We Learn About Social Networking Sites from Non-Users. *Information, Communication and Society*. Vol. 11, No. 4, pp. 544-564, Jun. 2008

how many people can anyone be friends with?

Dunbar's number: 150

"The figure of 150 represents the maximum number of individuals with whom we can have a genuinely social relationship, the kind of relationship that goes with knowing who they are and how they relate to us"



credit: Robin Dunbar

Intimates -> close personal friends -> friends -> acquaintances || -> || strangers

Cumulatively: 5 -> 15 -> 50 -> **150** (intimates+close friends+friends+acquaintances)

R. Dunbar, "Neocortex size as a constraint on group size in primates". *Journal of Human Evolution,* 22 (6), 1992
http://en.wikipedia.org/wiki/Dunbar%27s_number
D. Bennett, The Dunbar number, from the guru of social networks, Jan. 2013
http://www.businessweek.com/articles/2013-01-10/the-dunbar-number-from-the-guru-of-social-networks

exercise in class

Use your whatsapp contact list.

Manually code the first 150 people, appearing in your contact list, in the order in which they appear, according to this system:

(a) intimate (e.g. partner, parents, best friend)
(b) close personal friend
(c) friend
(d) acquaintance
(e) stranger (people-you-don't-really-know-but-somehow-got-in)

Respond to these questions via the online form:

* How many "friends" do you have in total?
* How many of your manually coded 150 friends belong to
    (a) Intimate;
    (b) Close personal friend;
    (c) Friend;
    (d) Acquaintance;
    (e) Stranger
* How easy was it to categorize your friends? (a) Easy; (b) Medium; (c) Hard
* Is your Dunbar's number higher than 150? (a) Higher; (b) About 150; (c) Lower

lessons learned

digital humanities as a motivation for computing

- way to approach gymnase students with diverse interests
- connect the past and their present
- links to other classes (history, geography, art, languages)

social media as an example of computing

- many connections to students' daily life
- …and to data and algorithms
- good to share research results with gymnase students
- natural links between computing, individual experiences, and societal implications

thanks