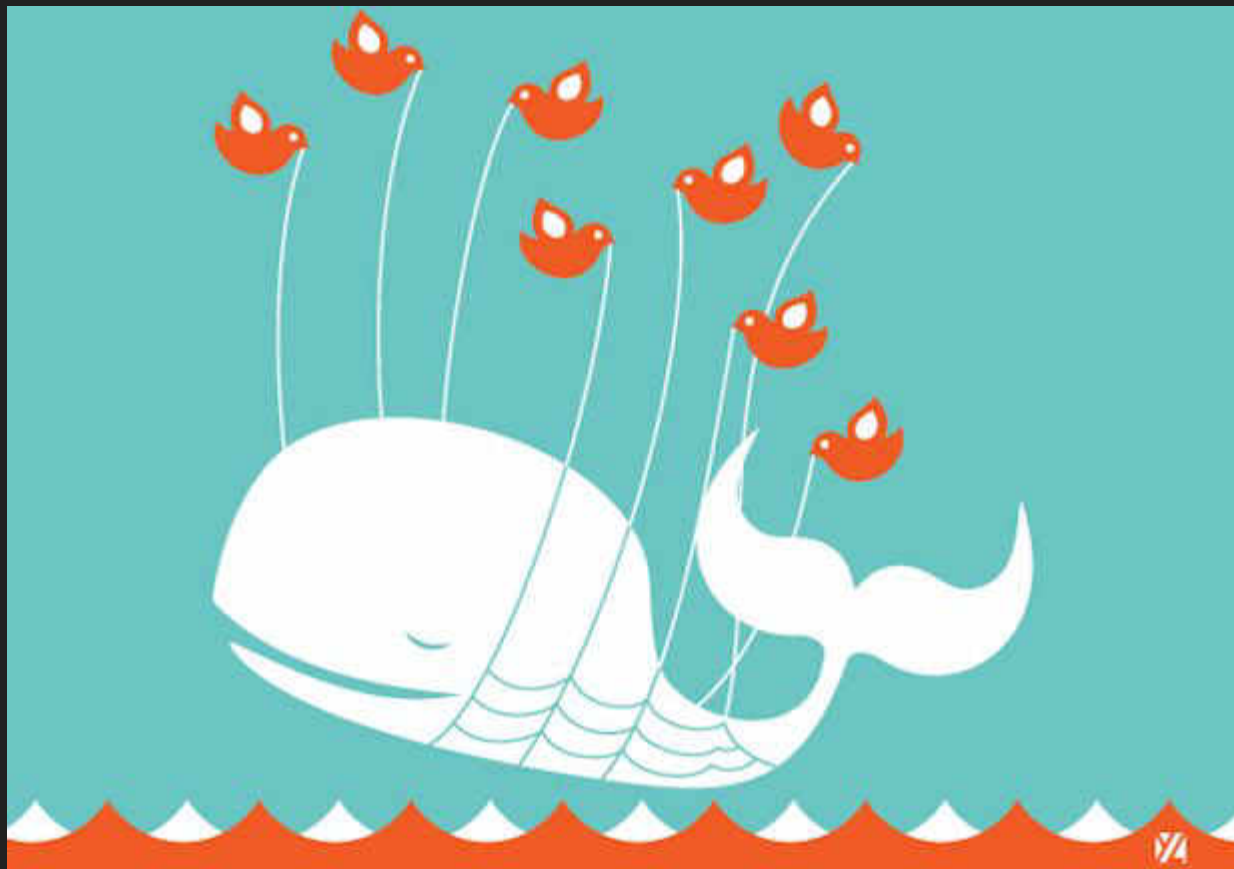


Social science of the Internet

Chung-hong “Chainsaw” Chan
陳電鋸

Technology is Wunderbar!
Unlimited scalability!

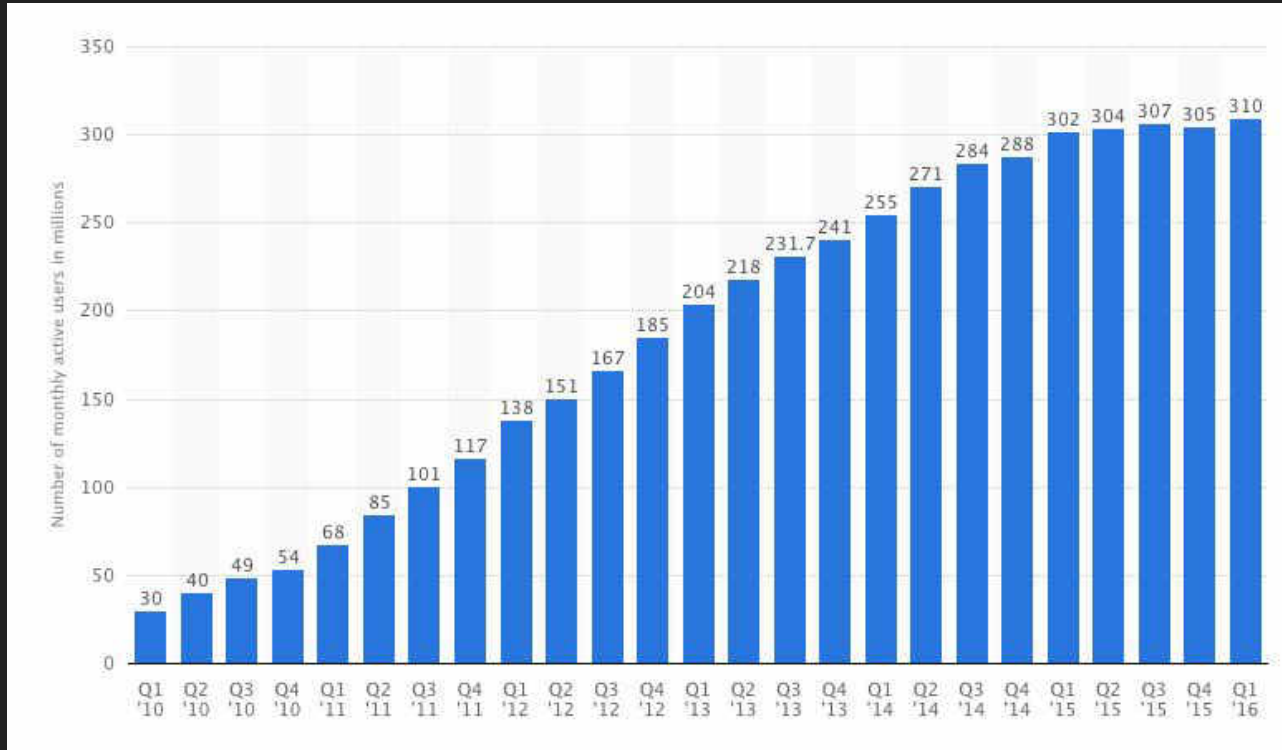
2007



ROR -> Scala (JVM) and stuff...

Claimed: 10,000% increase in capacity

10,000% increase in active users?



Source: statistica

[全部](#)[新聞](#)[圖片](#)[影片](#)[地圖](#)[更多 ▾](#)[搜尋工具](#)

約 103,000,000 項搜尋結果 (0.50 秒)

Why Twitter is dying, in ten tweets - New Statesman

www.newstatesman.com/science-tech/.../why-twitter-dying-ten-tweets ▾ 翻譯這個網頁

2016年2月8日 - **Twitter** has been **dying** since 2009, and commentators have pre-emptively declared it deceased pretty much every year since. To declare that ...

The End of Twitter - The New Yorker

www.newyorker.com/tech/elements/the-end-of-twitter ▾ 翻譯這個網頁

2016年1月29日 - **Twitter** used to be essential, but now Joshua Topolsky asks if the service can survive losing key executives and the flourishing competition.

Is Twitter dying? - Quora

<https://www.quora.com/Is-Twitter-dying> ▾ 翻譯這個網頁

Twitter isn't **dying**. You're just using it wrong. I've been hearing a lot of talk about the decline of **Twitter** lately, and I'd like to take a moment to set th...

Is Twitter dying or dead? Why Biz Stone the founder has left the ...

askmepc-webdesign.com/.../twitter-dying-founder-biz-stone-leaves-co... ▾ 翻譯這個網頁

Will twitter die? Is **twitter dying**? What do you think? Who is really using Twitter today? When Twitter started, I seriously thought it would never catch on, (but I ...

Why Twitter's Dying (And What You Can Learn From It) — Bad Words ...

<https://medium.com/.../why-twitter-s-dying-and-what-you-can-learn-fro...> ▾ 翻譯這個網頁

2015年10月13日 - It wasn't Professor Plum in the Library with the Candlestick. So what killed **Twitter**?

Competition

Facebook

Instagram

Snapchat

...

Mosh pit

“What really happens on Twitter these days? People have self-sorted into cliques, little in-groups, tribes. The purpose of tribes is to defend their beliefs, their ways, their customs, their culture — their ways of seeing the world.”

“Technology as a culture is so out of touch with reality doesn’t even understand what business it’s really in: not the code business (what is this, the 1980s?), but the enterprise of social interaction.”



Mosh pit

“When a technology is used to *shrink* people’s possibilities, more than to expand them, it cannot create value *for* them.”



Social Science

[n] the study of society and the way people live

Source: Oxford Dictionary

warning / acknowledgement

THIS IS A SOCIAL SCIENCE TALK, NOT TECHY AT ALL!

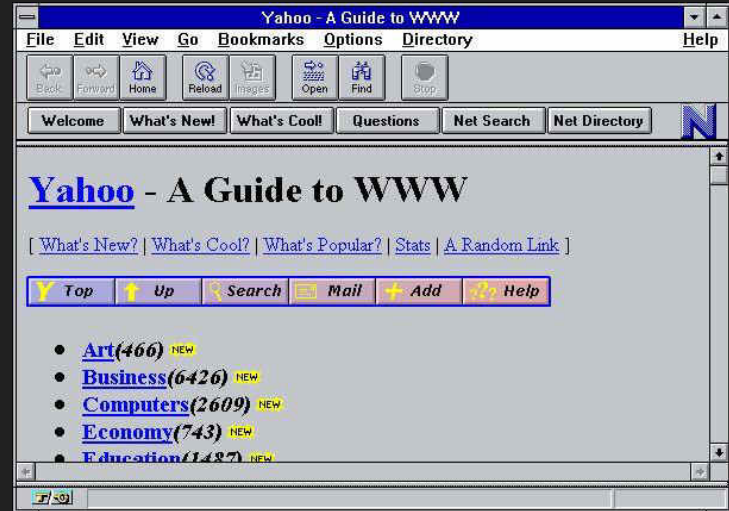


Internet metaphors

The Internet is like a

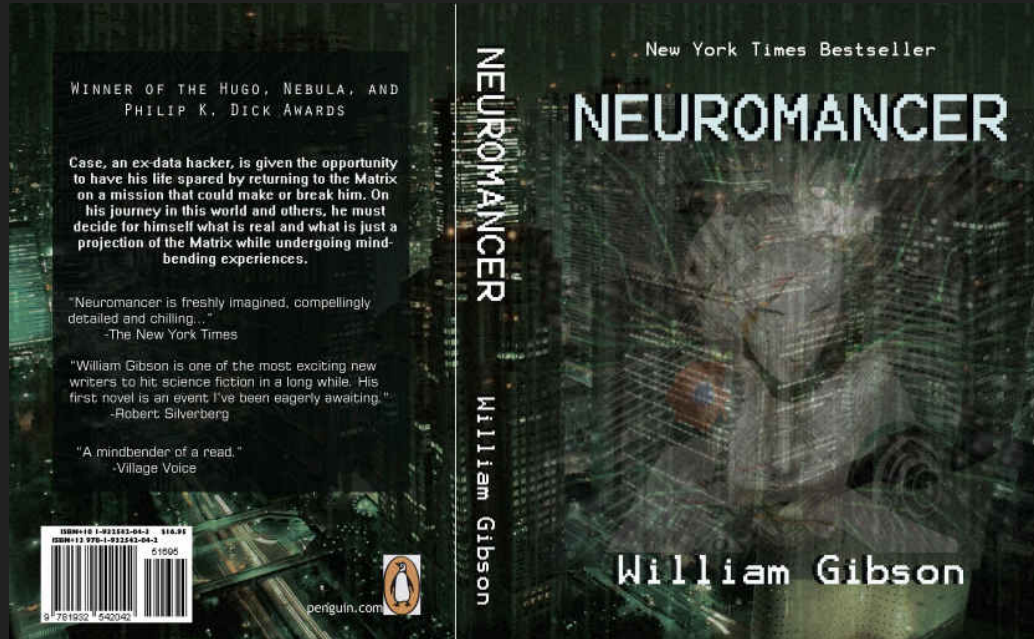


Original Macintosh (1984) Internet in a Box (1993)



Yahoo! on Netscape 1.0 (1994)

History of the Internet metaphors



1990: **Cyberspace** (borrow from Gibson's *Neuromancer*) - liberty

History of the Internet metaphors



1991: **Information superhighway** - speed and connectivity

History of the Internet metaphors



1990s: **Global Village** (borrow from McLuhan) - interconnected individuals

History of the Internet metaphors

**Electronic Communities:
Global Village or Cyberbalkans?**

Marshall Van Alstyne
Erik Brynjolfsson

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March, 1997

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KEYWORDS: Information Economy (AD02), Economic Theory (AM), Economic Impacts (BA01), Computerization of Society (BD0101), Organizational Structure (DA03), Information Flows (DD07), Globalization (AF1301)

1996: Cyberbalkans

van Alstyne, Brynjolfsson. 1996

Cyberbalkans

“Information technology can link geographically separated people and help them locate interesting or compatible resources. Although these attributes have the potential to bridge gaps and unite communities, they also have the potential to fragment interaction and divide groups by leading people to spend more time on special interests and by screening out less preferred contact.”

Echo Chamber

In media, an echo chamber is a situation in which information, ideas, or beliefs are amplified or reinforced by transmission and repetition inside an "enclosed" system, where different or competing views are censored, disallowed or otherwise underrepresented.

good old wikipedia

In Hong Kong netizens' jargon



photo credit: 安志新

圍爐取暖

translate server error

Hong Kong Facebook Pages Sharing network

Large hidden Communities (n > 30)

Detected by walktrap community detection algorithm

Mainstream (or leftards 左膠), n = 570

蘋果日報, 香港獨立媒體網, Keyboard Frontline 鍵盤戰線, HOCC, 學民思潮
Scholarism

Blue ribbon (藍絲), n = 37

時聞香港, 向香港警察致敬, 光復香港, 「保普選 反佔中」簽左名揮手區!, 理性撐國民教育

Large hidden Communities ($n > 30$)

Autonomists (or hotdogs 熱狗), $n = 332$

聚言時報 Polymer, 有種美德叫有種 by 陳到, PassionTimes 熱血時報, SocREC 社會記錄頻道, 科大行動

容樂其, Jeromy-yu Chan 及相關人士 (translate server error), $n = 31$

寰雨膠事錄 PlasticNews.wf, 方健儀 Akina Fong「多謝支持 後會有期」, 輔仁媒體, Econ記者, 新聞噏乜9

Word cloud: Unique culture for each community

WHY?

Big data analytics cannot answer this question!



Self-sorting in workplace?



Self-sorting on social media

The image shows a screenshot of a Facebook profile page for Mart Van de Ven. The browser's address bar at the top displays the URL `https://www.facebook.com/tijptjik?fref=nf`. The profile header includes a profile picture of a man with glasses, the name "Mart Van de Ven", and a cover photo featuring a man with his hands raised in front of a wall with torn paper and the words "Perception" and "uncertainty". Below the name are navigation tabs for "Timeline", "About", "Friends", "Photos", and "More". The "Friends" tab is selected, showing "23 Mutual" friends. A context menu is open over the "Friends" button, listing options: "Get Notifications", "Close Friends", "Acquaintances", "Add to another list...", "Suggest Friends...", and "Unfriend".

← → ↻ <https://www.facebook.com/tijptjik?fref=nf>

f Mart Van de Ven 🔍

Fuk Home Find Friends

Perception
with care,
uncertainty

Mart Van de Ven

✓ Friends
✓ Following
Message

Get Notifications
Close Friends
Acquaintances
Add to another list...
Suggest Friends...
Unfriend

Became friends with Lance Cheung and 11 other people.

Director, Data Scientist at Droste and Data Science Instructor at General Assembly
Past: Open Data Hong Kong and Demyst.Data

Post Photo / Video

Write something...

Political consequences of self-sorting

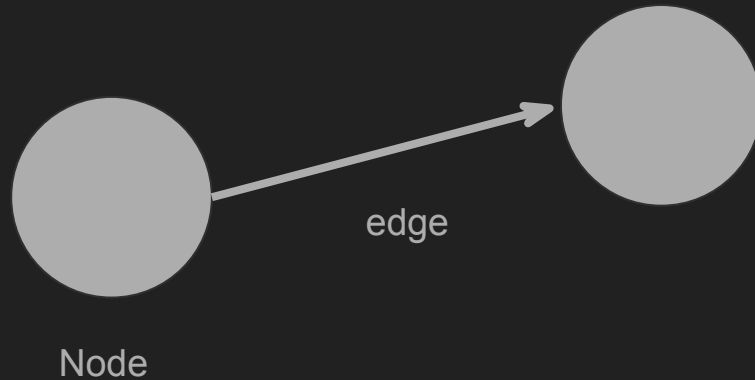
“Some bloggers, and many readers of blogs, try to create echo chambers. Because of self-sorting, people are reading like-minded points of view, in a way that can breed greater confidence, more uniformity within groups, and more extremism.”



Mechanism

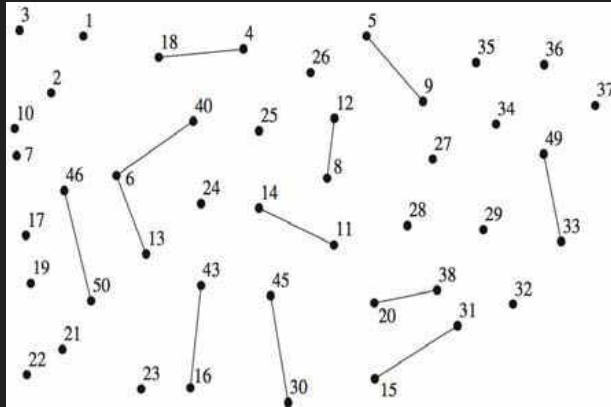
Formation of social network and community

MATHS ALERT!

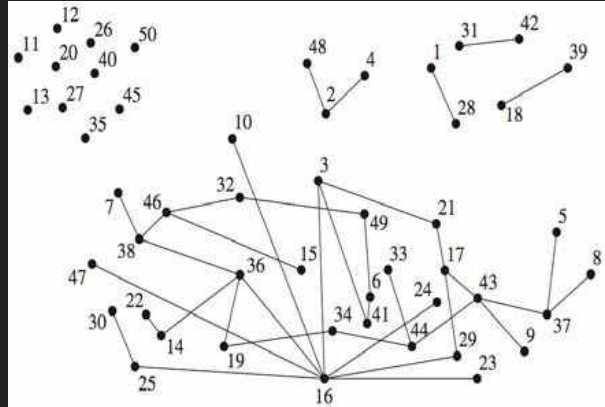


Erdos-Renyi model

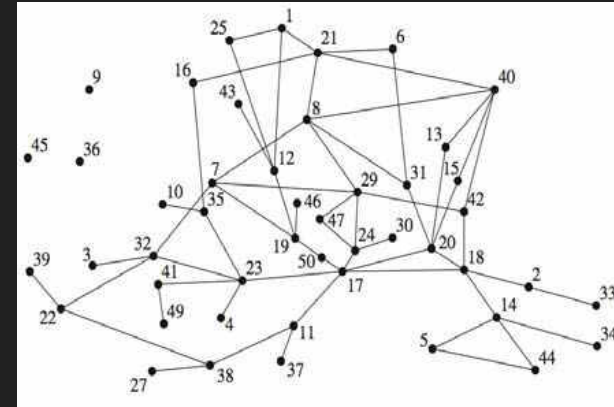
If the probability (p) of edge formation is constant, one giant component can be formed



$p = 0.01$



$p = 0.03$



$p = 0.05$



Town hall meeting



大台

translate server error

Barabasi-Albert Model

The probability of edge formation is not constant.

That probability is governed by a phenomenon called “Preferential Attachment”



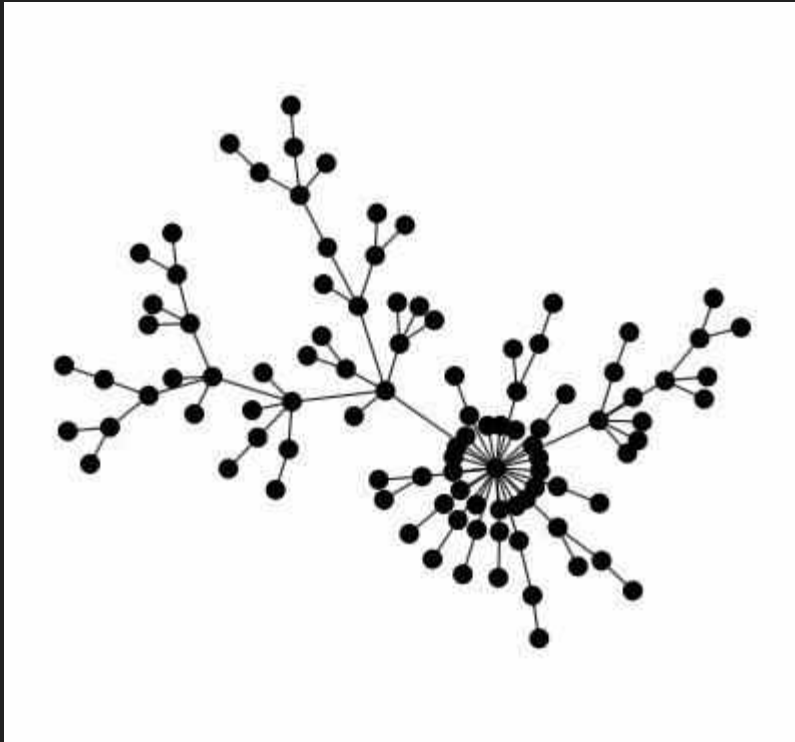
唔洗估喇，風平浪靜，
聽朝早啲起身返工啦！

富者愈富

the rich get richer

Preferential attachment

Edges tend to be form with heavily linked nodes



Power law distribution / "Long tail"

Community formation

Both Erdos-Renyi and Barabasi-Albert cannot guarantee the genesis of community structure within the social network

Then why? Let's find out

Agent-based modeling (ABM) is one of a class of computational models for simulating the actions and interactions of autonomous agents (both individual or collective entities such as organizations or groups) with a view to assessing their effects on the system as a whole.

again, good old wikipedia



Boids (Bird-oid object, Bird like object)

Reynolds C, 1986

Average speed: 4.15 p/f
Standard deviation: 0.36 p/f

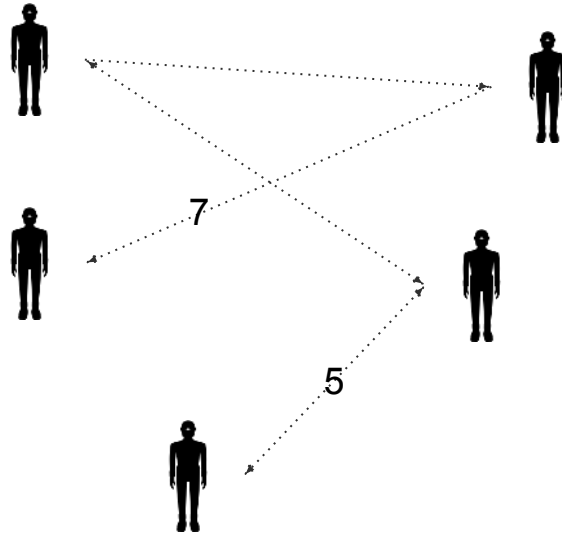
```
class faceboid():
    def __init__(self, boidid, mutualignore = False):
        self.mutualignore = mutualignore
        self.ignore = set([])
        self.friends = set([])
        self.boidid = boidid
    def __str__(self):
        return "faceboid #" + str(self.boidid)
    def posting(self, postid, date):
        return fbpost(self.boidid, postid, date)
    def retweet(self, fbpost, poster_boid):
        if self.mutualignore is not True or (self.mutualignore and poster_boid.boidid not in self.ignore):
            fbpost.retweetedby.append(self.boidid)
        elif self.mutualignore and poster_boid.boidid in self.ignore:
            fbpost = None
        return fbpost
```

```
class fbpost:
```

Faceboids (Facebook-oid object)

Chan CH, Fu KW. 2015

Social network

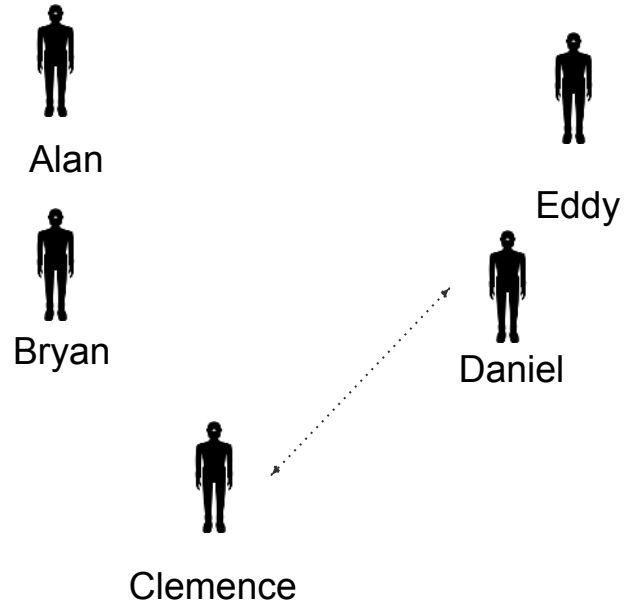


Sharing network

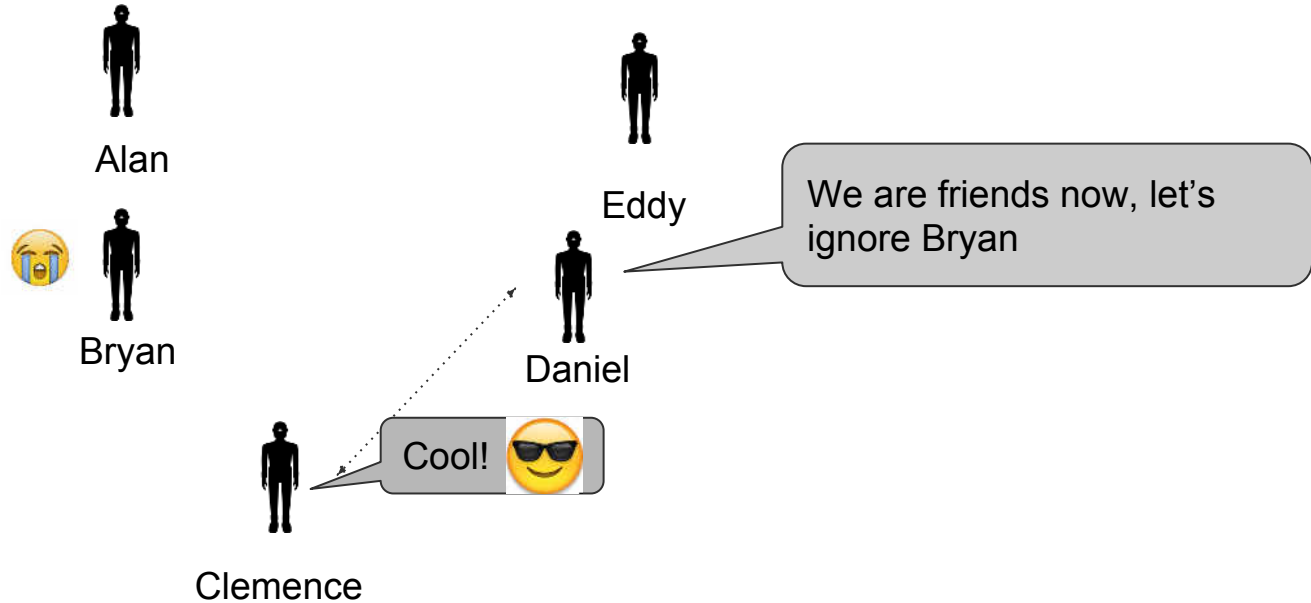
$$\text{Prob}_{\text{RT}} = \text{Prob}_{\text{MaxRT}} * (N_{\text{RT}} / \text{Max } N_{\text{RT}})$$

Preferential Attachment

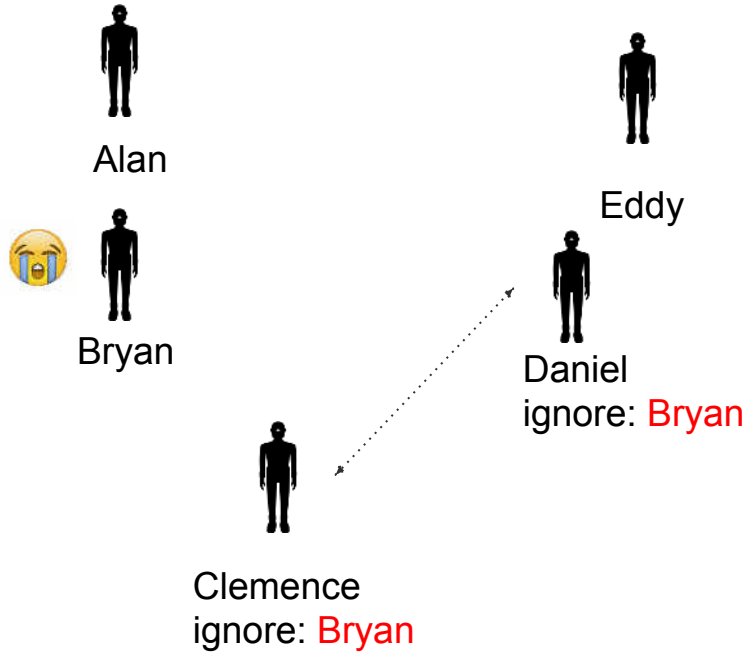
Mutual ignoring



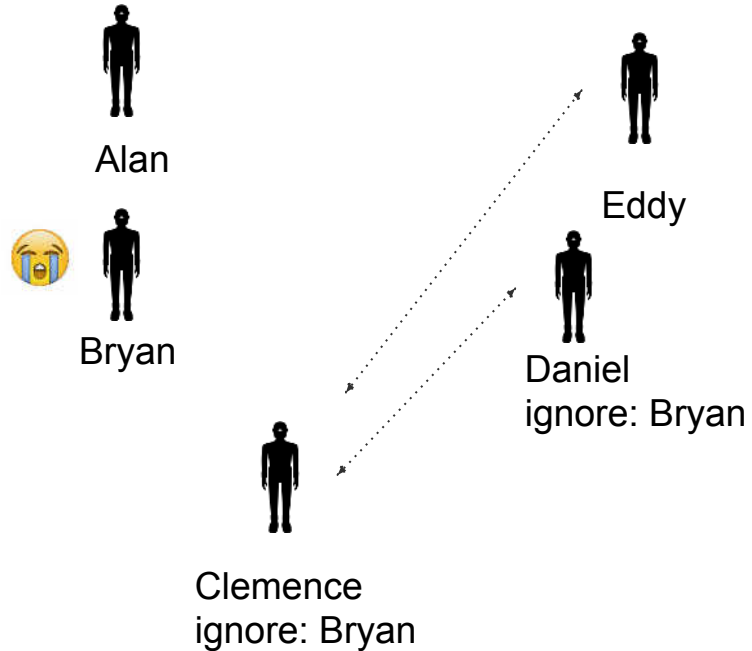
Mutual ignoring



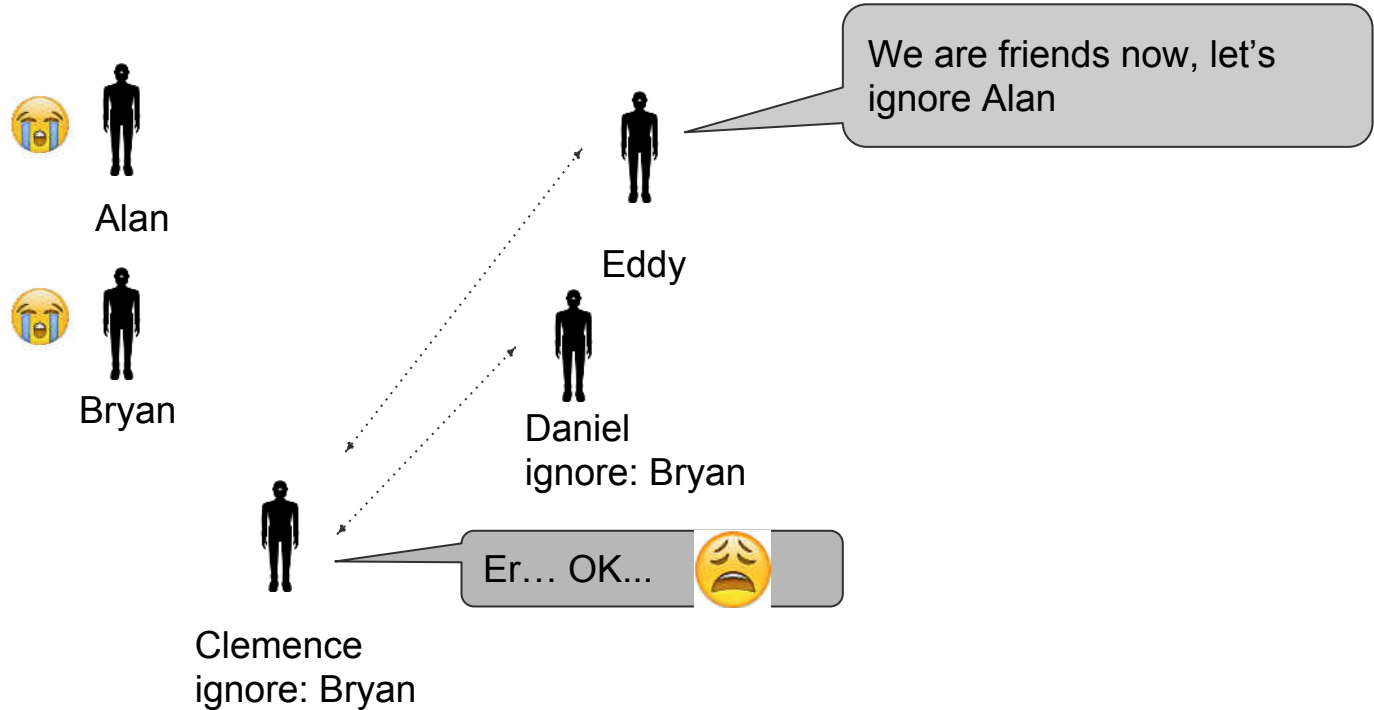
Mutual ignoring



Mutual ignoring and sync



Mutual ignoring and sync



Mutual ignoring and sync



Alan



Bryan




Clemence
ignore: Bryan, Alan

BTW, I hate Bryan!

Daniel
ignore: Bryan

Eddy
ignore: Alan

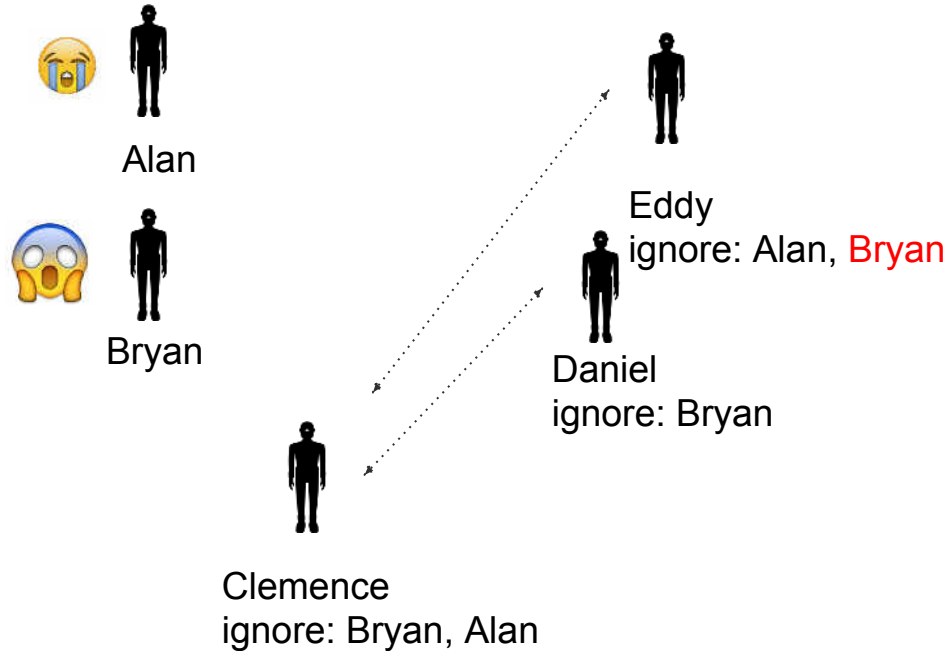


Oh! I didn't know Bryan is such a  !

Let me ignore him also!



Mutual ignoring and sync



Inclusion of 'Mutual Ignoring' behavior

The networks generated with “preferential attachment + Mutual ignoring” agents are more likely to be organized as stronger communities than those generated from “preferential attachment only” agents.

Lethal combination: Preferential Attachment + Mutual Ignoring

Our social media platforms are encouraging

Preferential attachment



Our social media are encouraging

and mutual ignoring



Friend suggestion based on Mutual Friend is encouraging mutual ignoring

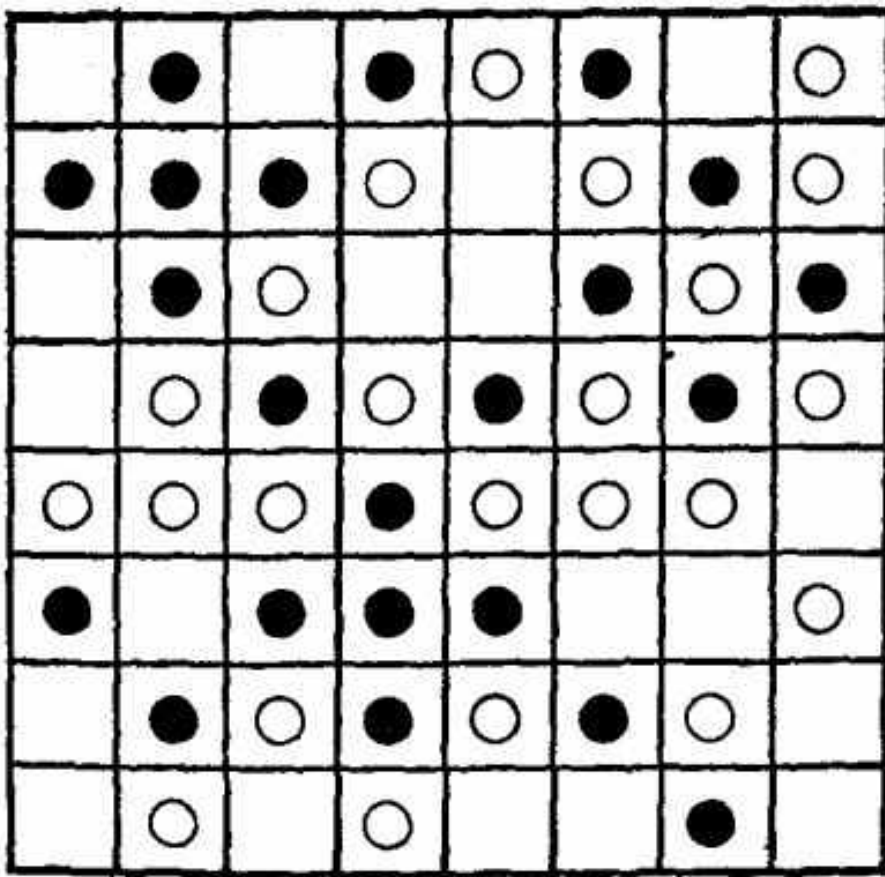
Because our attention is limited

Dunbar's number

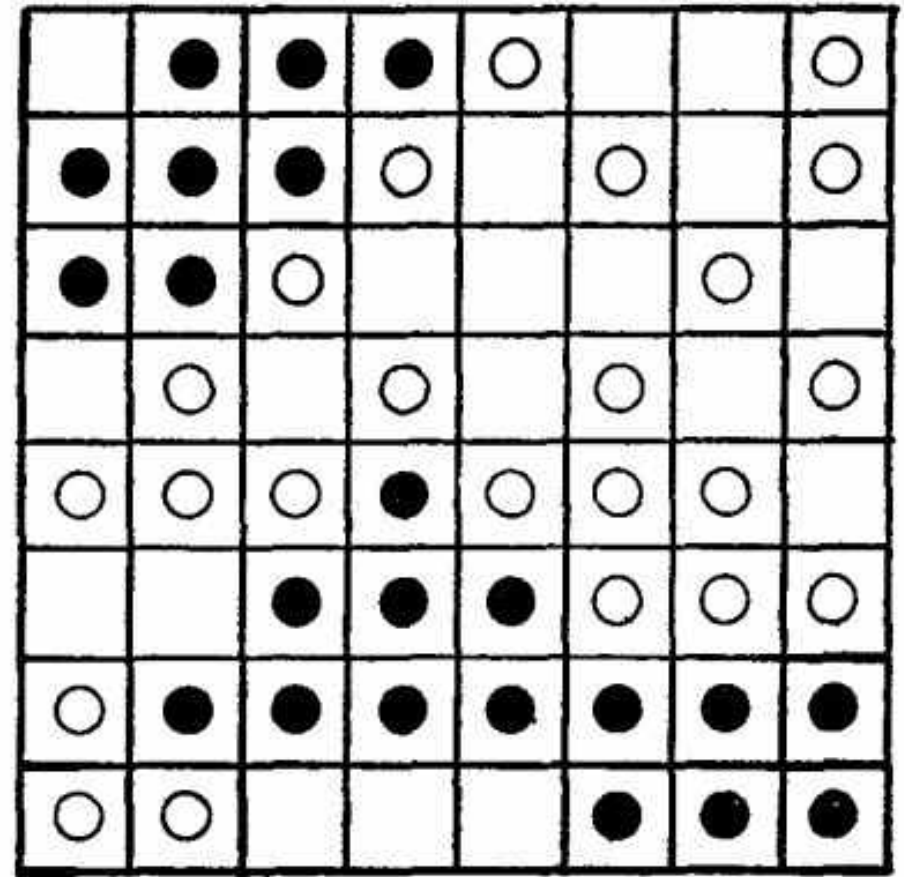
Dunbar's number is a suggested cognitive limit to the number of people with whom one can maintain stable social relationships. (~ 150)

Zero sum game: Two users attended to similar set of 'mutual friends' = ignoring similar set of people (mutual ignoring)

This small aversion bias (like to friends with friends of mutual friends) alone can generate segregation



(a)

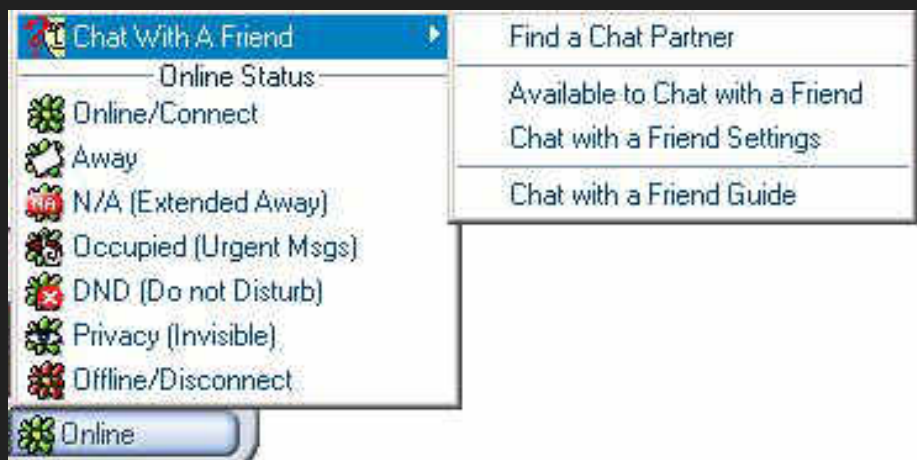


(b)

Model of Ethnic Residential Dynamics

Schelling T, 1974 (original), Henry AD, 2011 (Social Network version)

Old technology did it better: ICQ



Who am I?

- PhD candidate from the Journalism and Media Studies Centre, HKU
- Research Interest: Consequences of Cyberbalkanization
- Maintainer of HKU Weiboscope



END