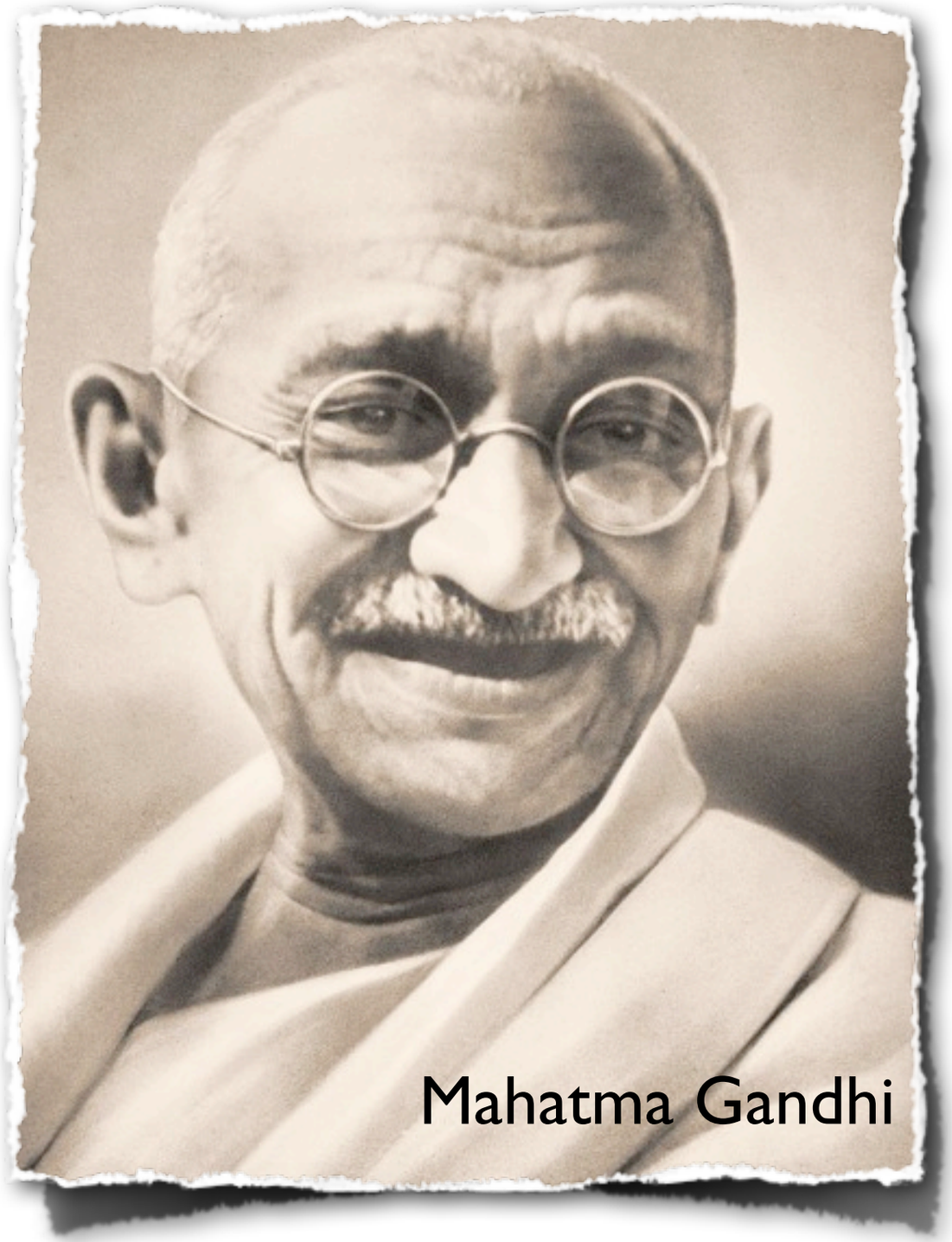
# Introduction to Social Computing and Its Computation Techniques

Irwin King, Baichuan Li, and Tom Chao Zhou
{king, bcli, czhou}@cse.cuhk.edu.hk

Department of Computer Science and Engineering
The Chinese University of Hong Kong

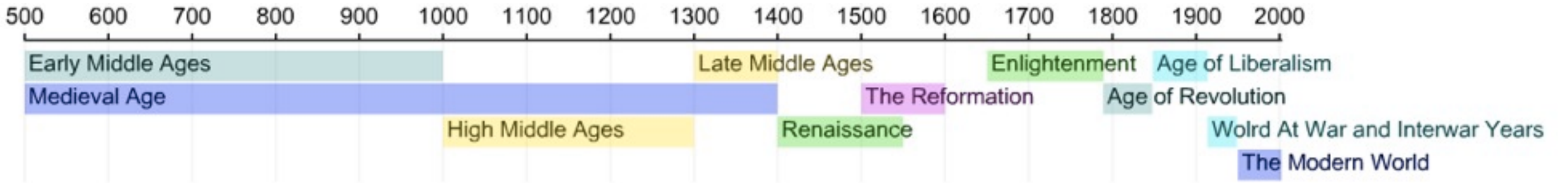


Mahatma Gandhi

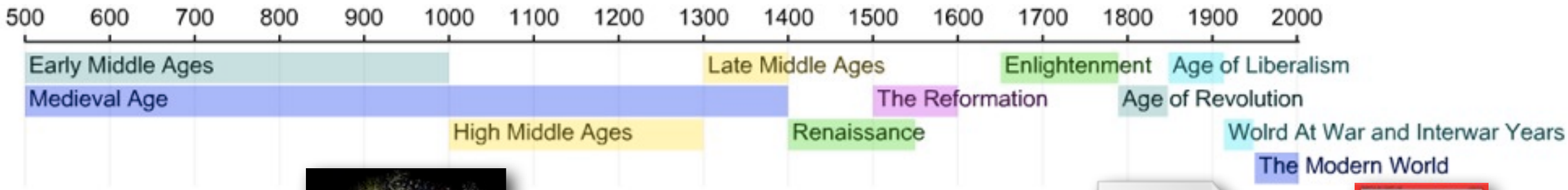
*Interdependence is and ought to be as much the ideal of man as self-sufficiency.*

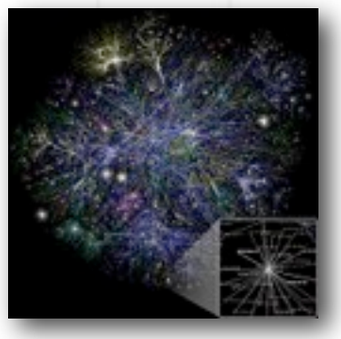
*Man is a social being.*

# A Brief History of the World



# A Brief History of the World

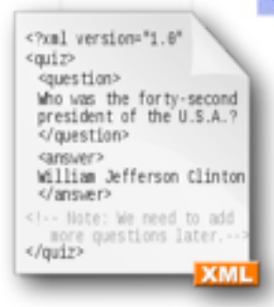


Birth of Internet

IBM Desktop PC

Apple Macintosh




Birth of XML

Time Magazine
Person of the Year

1750 1945 1969 1975 1981 1983 1984 1989 1996 2004 2006

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**Industrial Revolution** | **Information Age** | **Internet Age** | **www Age** | **Attention Age**

ENIAC

The MITS Altair
Apple II

Time Magazine
Person of the Year

Birth of WWW

Birth of Web 2.0

intel
revolution in evolution
Highlights from the Journey to 1 Billion PCs
1,000,000,000
900,000,000
800,000,000
700,000,000
600,000,000
500,000,000
400,000,000
300,000,000
200,000,000
100,000,000
1971 – Intel, founded by Robert Noyce, Gordon Moore and Andy Grove, introduces the world's first microprocessor and calls it the Intel® 4004.
1974 – Intel introduces the 8080 microprocessor, which was used in the first commercially successful personal computer – the Altair.
1976 – Apple Computer, Inc. releases the Apple I, the first single-circuit board computer.[1] The following year, the company introduces the Apple II. A first for a personal computer, the Apple II featured colorful graphics.[1]
1981 – IBM introduces its 'first personal computer featuring the Intel® 8088 microprocessor. It sparked the PC revolution and set industry standards that still exist today. "The IBM platform enabled hardware makers and software programmers to develop programs and add-on accessories. Until then, most PCs had been closed and proprietary.
Shugart Associates introduces the hard drive, bringing high-capacity data storage to the PC.
Adam Osborne completes the first portable computer, the Osborne I. It weighs 24 pounds and plugs into the wall.[1]
1982 – Lotus Development Corporation introduces Lotus 1-2-3, which becomes a best-seller application.[1]
SHD Systems Corporation brings to market the first battery-powered laptop and launches the portable computer industry.
1983 – The IBM PC/XT establishes the IBM format PC featuring an Intel processor, Microsoft DOS and a hard drive as the most popular personal computing platform.
1984 – Apple introduces the Macintosh with a GUI. A GUI is a graphical user interface that provides visual representation for what was previously lines of DOS code, making PCs more usable for non-technical people.
1985 – Intel introduces the 386™ microprocessor featuring 275,000 transistors – more than 100 times as many as the original 4004. The 386™ microprocessor was a 32-bit chip that brought "multi-tasking" capabilities to the PC.
Microsoft ships the Windows® operating system with a graphical user interface.
America Online is founded.[1]
1986 – The number of PCs shipped worldwide reaches nearly 64 million and a 15-year period of continuous growth begins.[1]
1987 – Toshiba introduces the T1000 laptop PC, making portable computing more widely available.
1988 – Recordable CD discs become available.[1]
1989 – The number of PCs shipped worldwide reaches nearly 130 million.[1]
1990 – In Geneva, Switzerland, Tim Berners-Lee develops a new technique for distributing information on the Internet, eventually called the World Wide Web.
Leading PC manufacturers begin to introduce laptops equipped with Microsoft Windows® and the Intel® 386SL™ — the first processor designed specifically for a mobile computer.
1991 – Creative Labs introduces a Multimedia Upgrade Kit containing a CD-ROM drive, Sound Blaster® Pro board, speakers and multimedia software.
1992 – The number of PCs shipped worldwide reaches 202 million.[1]
1993 – Intel introduces the Pentium® processor and Microsoft introduces Windows® 3.1, providing a solid multimedia platform for consumer games and learning applications. Increased processing capabilities, coupled with the availability of affordable CD-ROM drives and sound cards, usher in multimedia on the PC.
Marc Andreessen creates an Internet browser called Netscape.[1]
PC gaming comes of age when id Software® unleashes 3DOOM, one of the most popular PC games ever. 3DOOM also introduced multiplayer gaming to the masses, allowing players to compete in intense 4-player LAN or head-to-head modem competitions.[1]
1994 – The number of PCs shipped worldwide reaches nearly 268 million.[1]
1995 – Microsoft launches Windows® 95 and its browser Internet Explorer. Selling more than 1 million copies in the first four days, the operating system helps move PCs into more than 250 million businesses, homes, and schools around the world.[1]
The number of PCs shipped worldwide reaches more than 347 million.[1]
1996 – The Digital Versatile Disc (DVD) debuts at the Consumer Electronics Show.[1] Fujitsu introduces the technology into the FMV Diskpower series, powered by the Pentium® processor.[1]
The first 3-D graphics accelerators bring advanced PC gaming to the home.[1]
Approximately 40 million people are connected to the Internet and more than 1 billion dollars change hands online.[1]
1997 – Intel introduces the Pentium® II processor and the number of PCs shipped worldwide reaches more than 400 million.[1]
Recordable and re-writeable DVD discs become available.[1]
1998 – Diamond Multimedia Systems, Inc. pioneers portable MP3 digital music technology with the launch of the Rio PMP 300.
The number of PCs shipped worldwide reaches 590 million.[1]
1999 – Napster is founded and users share digital music online.[1]
Intel introduces the Pentium® III processor. Americans are sending 2.2 billion e-mail messages a day, compared with just 250 million pieces of first-class mail.[1]
The number of PCs shipped worldwide is nearly 206 million.[1]
2000 – Intel introduces the Pentium® 4 processor and an estimated 400 million people worldwide are connected to the Internet by the end of the year – more than double the number of people connected in September 1999.[1]
2001 – 20th anniversary of IBM's first personal computer. Microsoft introduces the Windows® XP operating system. Nearly half a billion people around the world have access to the Internet from their homes.[1]
The number of PCs shipped worldwide reaches 861 million.[1]
2002 – Intel introduces the Mobile Intel® Pentium® 4 Processor-M, bringing desktop performance to the laptop PC.
The PC industry ships the 1 billionth PC, according to industry analyst firm Gartner Dataquest.[1]
2003-2008 – The number of PCs shipped worldwide may reach 2 billion, according to industry analyst firm Gartner Dataquest.[1]
1,000,000,000
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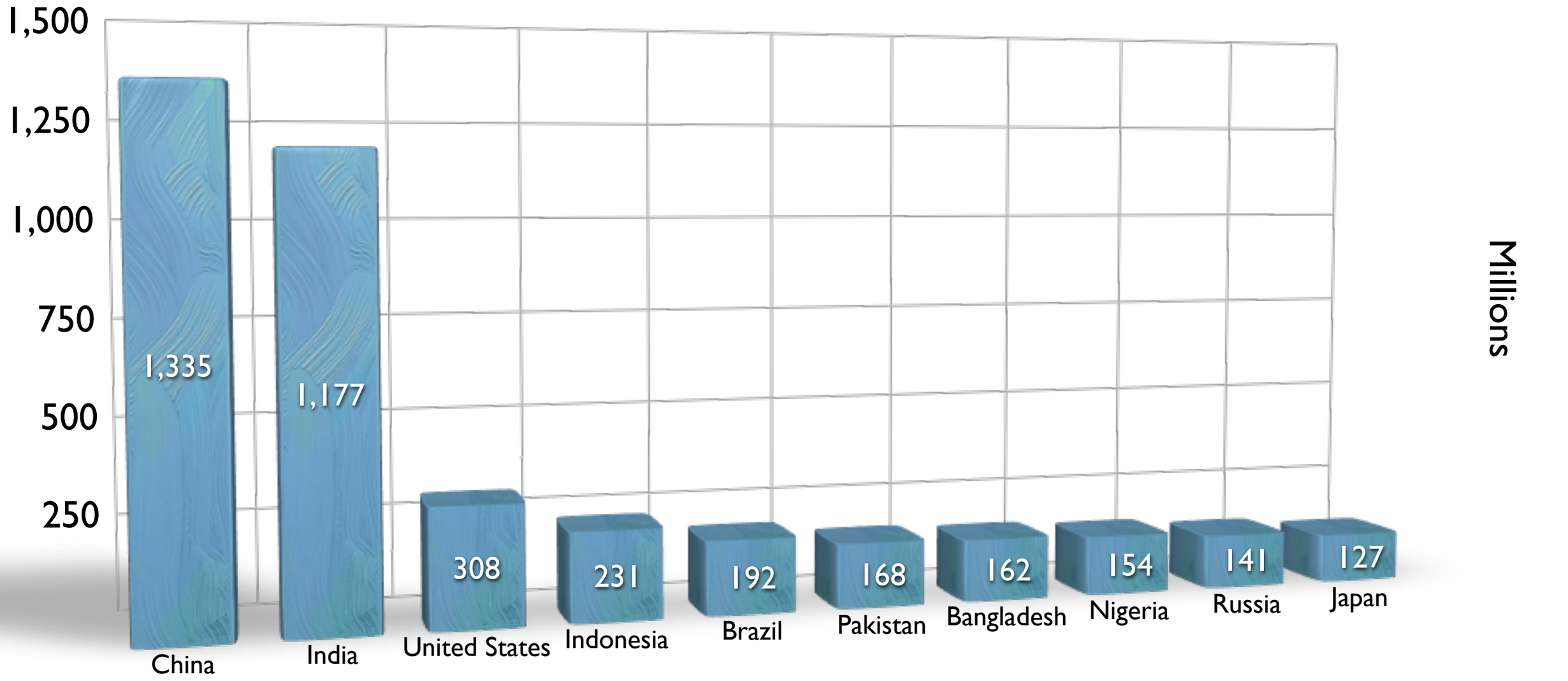
For more information, please visit http://www.intel.com

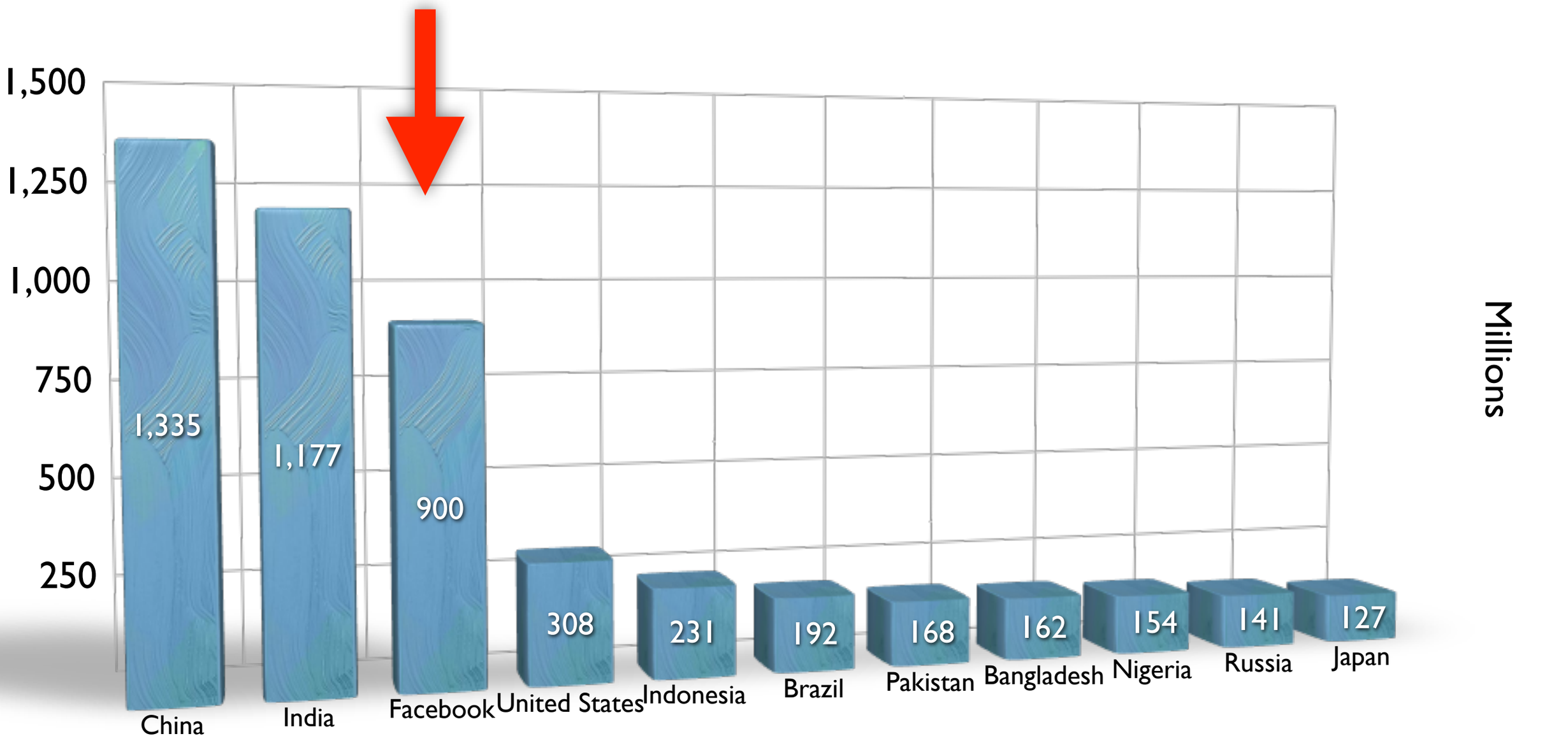
# Top 10 Populations by Countries

## as of July 2009



# Top 10 Populations by Countries

## Facebook as of March 2012



# Facebook's Growth Stats

**Statistics**

901 million monthly active users at the end of March 2012.
Approximately 80% of our monthly active users are outside the U.S. and Canada.
526 million daily active users on average in March 2012.
488 million monthly active users who used Facebook mobile products in March 2012, and more than 500 million mobile monthly active users as of April 20, 2012.
During March 2012, on average 398 million users were active with Facebook on at least six out of the last seven days.

Last week | Last 2 weeks | **Last month** | Last 3 months | Last 6 months

| # | Country | Users | Change | (± %) | Pen. |
|---|---|---|---|---|---|
| 1. | United States | 156 830 580 | -517 760 | -0.33% | 50.55% |
| 2. | Brazil | 48 041 640 | +1 030 580 | +2.19% | 23.89% |
| 3. | India | 46 307 580 | +481 960 | +1.05% | 3.95% |
| 4. | Indonesia | 42 596 260 | +324 220 | +0.77% | 17.53% |
| 5. | Mexico | 33 587 760 | +413 920 | +1.25% | 29.86% |
| 6. | United Kingdom | 31 106 860 | +161 760 | +0.52% | 49.89% |
| 7. | Turkey | 30 651 580 | -26 720 | -0.09% | 39.40% |
| 8. | Philippines | 27 107 600 | +19 280 | +0.07% | 27.13% |
| 9. | France | 24 435 760 | +88 120 | +0.36% | 37.73% |
| 10. | Germany | 23 687 880 | +135 200 | +0.57% | 28.79% |

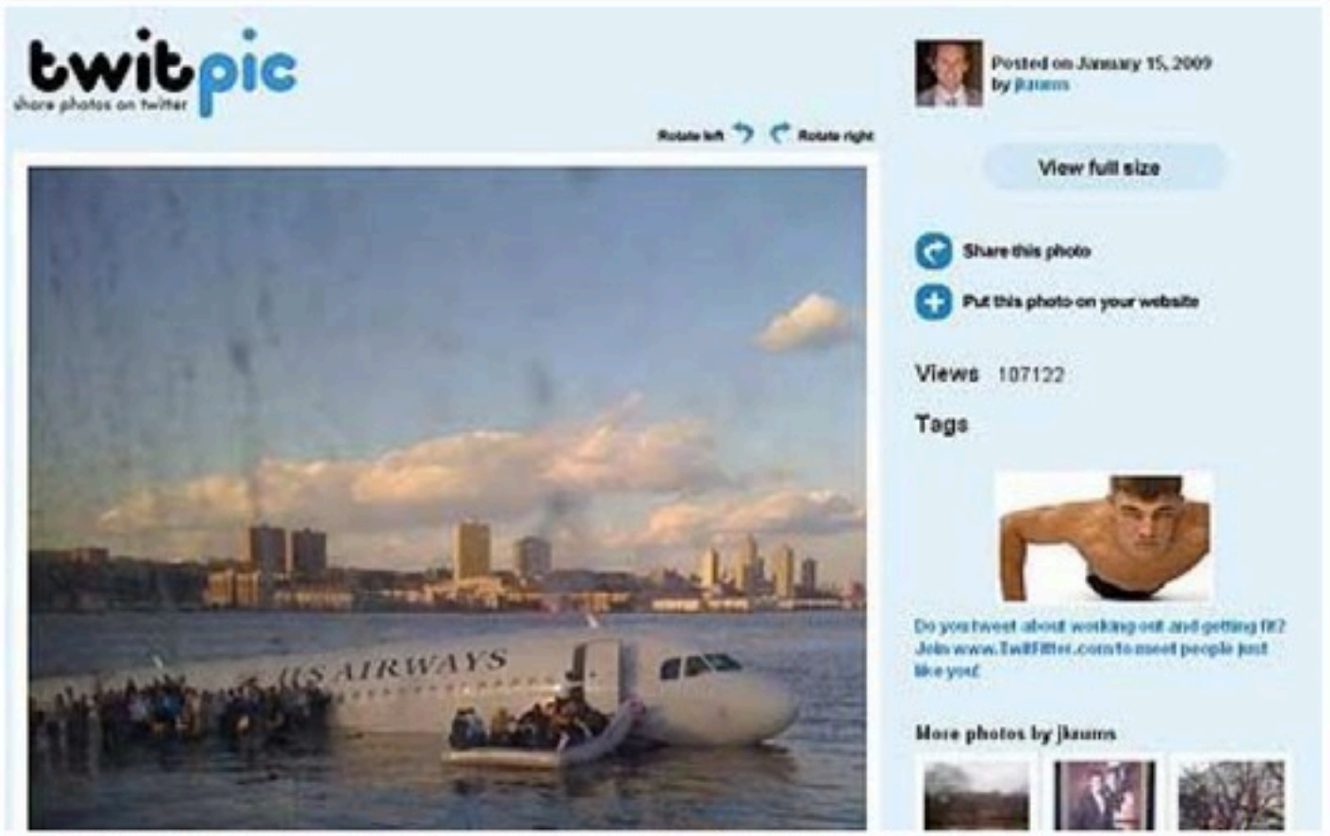
# Global Internet Traffic

| Alexa as of August 2011 | China | USA | Japan | India | Brazil | Global |
|---|---|---|---|---|---|---|
| 1 | Baidu | Google | Yahoo.jp | Google.in | Google.br | Google |
| 2 | QQ | Facebook | Google.jp | Google | Google | Facebook |
| 3 | Sina | Yahoo! | FC2 | Facebook | Facebook | YouTube |
| 4 | Taobao | YouTube | YouTube | YouTube | YouTube | Yahoo! |
| 5 | Google.hk | Amazon | Google | Yahoo! | Universo Online | Blogger |
| 6 | 163 | Wikipedia | Ameblo.jp | Blogger | Windows Live | Baidu |
| 7 | Weibo | Blogger | rakuten | Wikipedia | Globo | Wikipedia |
| 8 | Google | Twitter | livdoor | LinkedIn | Orkut.com.br | Windows Live |
| 9 | ifeng | eBay | Facebook | Twitter | Yahoo! | Twitter |
| 10 | Yahoo | Craigslist | Wikipedia | Rediff | Orkut.com | QQ |

# Twitter in Spotlight

## New York plane crash: Twitter breaks the news, again

Twitter has once again led the media and the blogosphere in breaking news.




Twitter lead the media and the blogosphere in breaking news about US Airways flight 1549 crashing in New York's Hudson river

**By Claudine Beaumont**

11:29AM GMT 16 Jan 2009

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Email

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+1 0

**Twitter**

Travel » World News »
Major News »
Travel News »
Technology »

**IN TECHNOLOGY »**

# Twitter Gainers

## Top Twitter Gainers

erol köse

+100 381
Followers

Katy Perry

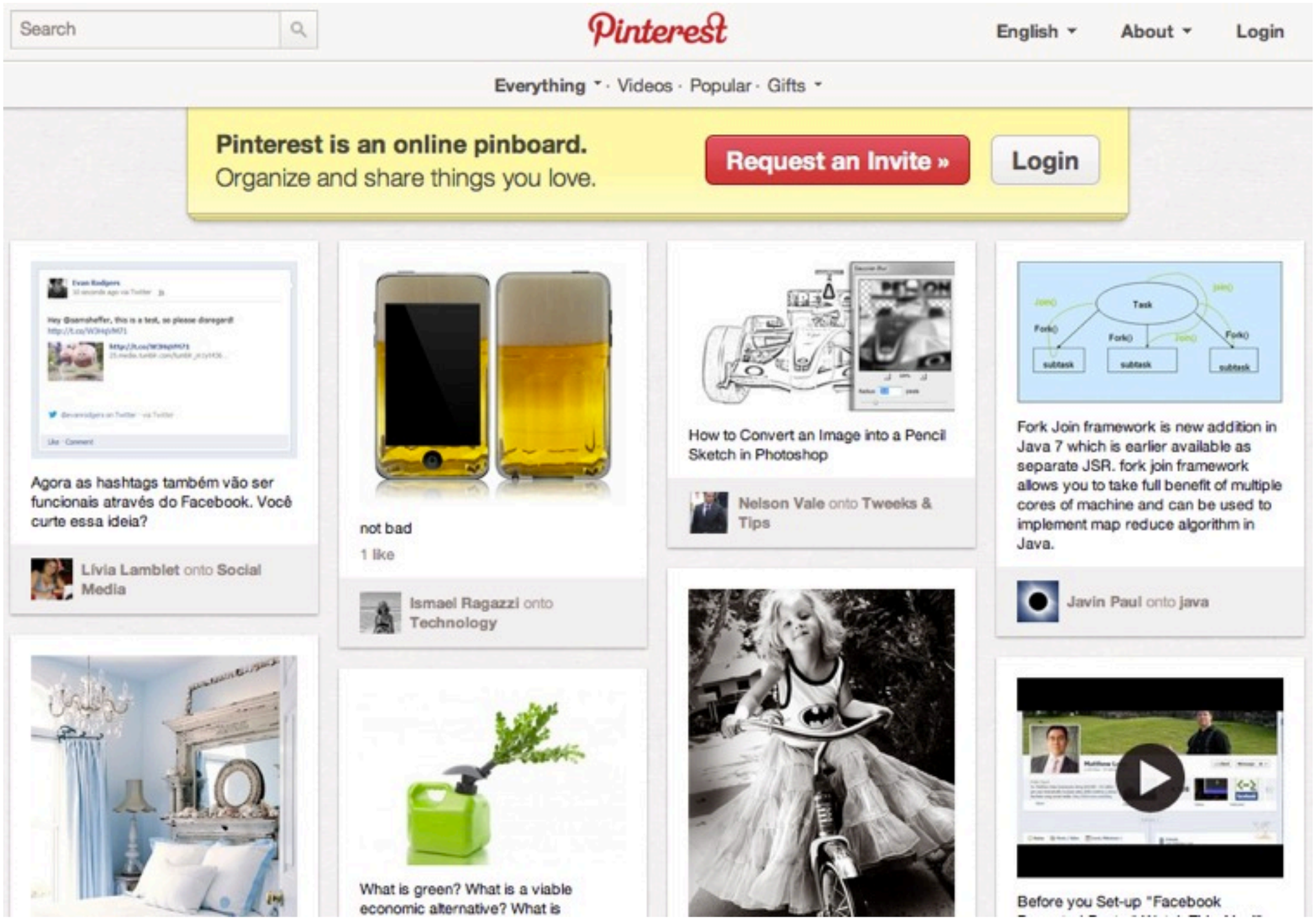
+439 801
Followers

Rihanna

+1 790 017
Followers

| # | Screen name | Following | Followers ▼ |
|---|---|---|---|
| 1. | Lady Gaga (@ladygaga) | 138 640 | 25 455 849 |
| 2. | Justin Bieber (@justinbieber) | 122 725 | 23 051 871 |
| 3. | Katy Perry (@katyperry) | 98 | 20 967 819 |
| 4. | Rihanna (@rihanna) | 815 | 20 332 267 |
| 5. | Britney Spears (@britneyspears) | 415 313 | 17 495 465 |
| 6. | Shakira (@shakira) | 66 | 16 442 764 |
| 7. | Barack Obama (@BarackObama) | 677 280 | 16 391 776 |
| 8. | Taylor Swift (@taylorswift13) | 78 | 14 920 243 |
| 9. | Kim Kardashian (@KimKardashian) | 173 | 14 899 107 |
| 10. | YouTube (@YouTube) | 422 | 13 531 122 |

# Pinup Interests



# The Brave New Words

blogger

wiki

AVATAR

頭像

tag cloud

mash-up

unfriend

tweet

blogsphere

twitterati

defriend

hashtags

SEXTING

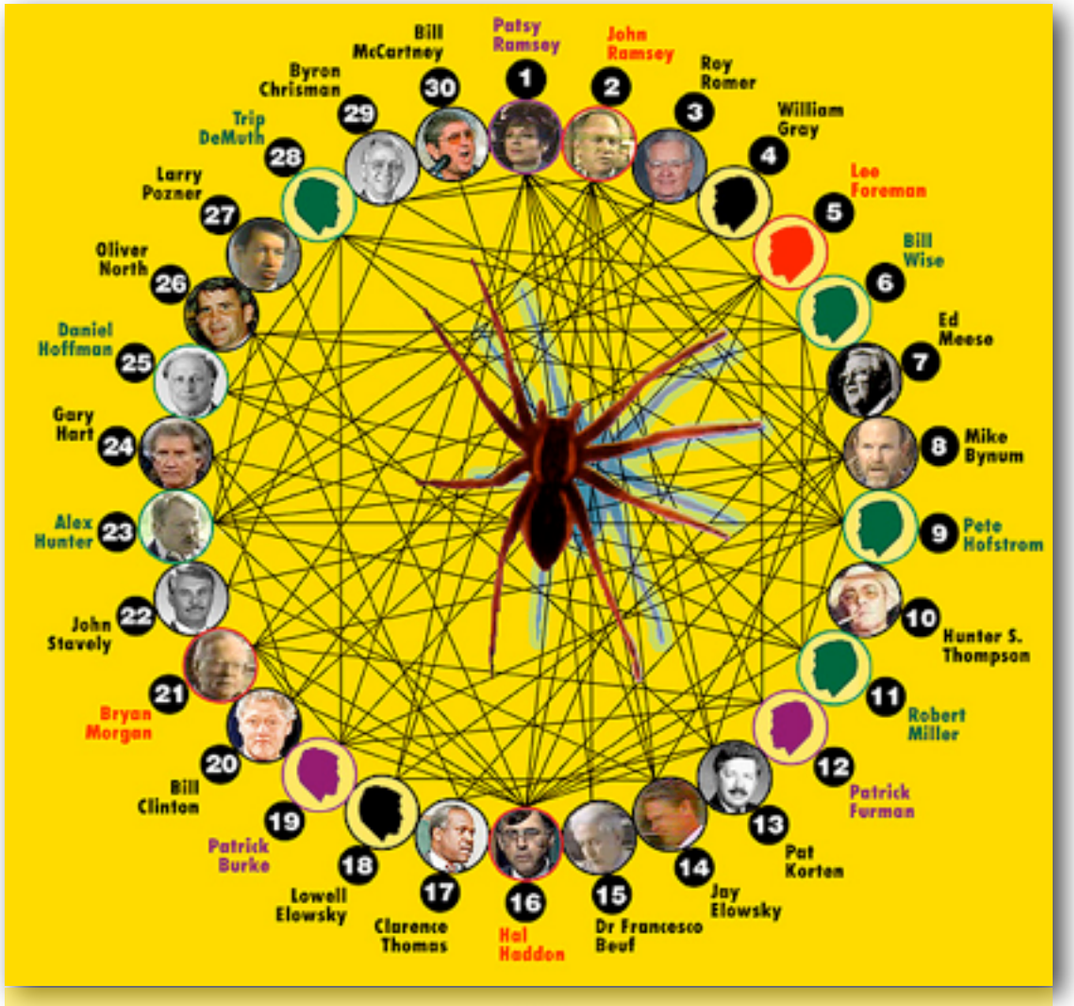
Folksonomy

# Web 2.0

- Web as a medium vs. **Web as a platform**
- Read-Only Web vs. **Read-and-Write Web**
- Static vs. **Dynamic**
- Restrictive vs. **Freedom & Empowerment**
- Technology-centric vs. **User-centric**
- Limited vs. **Rich User Experience**
- Individualistic vs. **Group/Collective Behavior**
- Consumer vs. **Producer**
- Transactional vs. **Relational**
- Top-down vs. **Bottom-up**
- People-to-Machine vs. **People-to-People**
- Search & browse vs. **Publish & Subscribe**
- Closed application vs. **Service-oriented Services**
- Functionality vs. **Utility**
- Data vs. **Value**

# Social Networks

Society:
Nodes: individuals
Links: social relationship
(family/work/friendship/etc.)

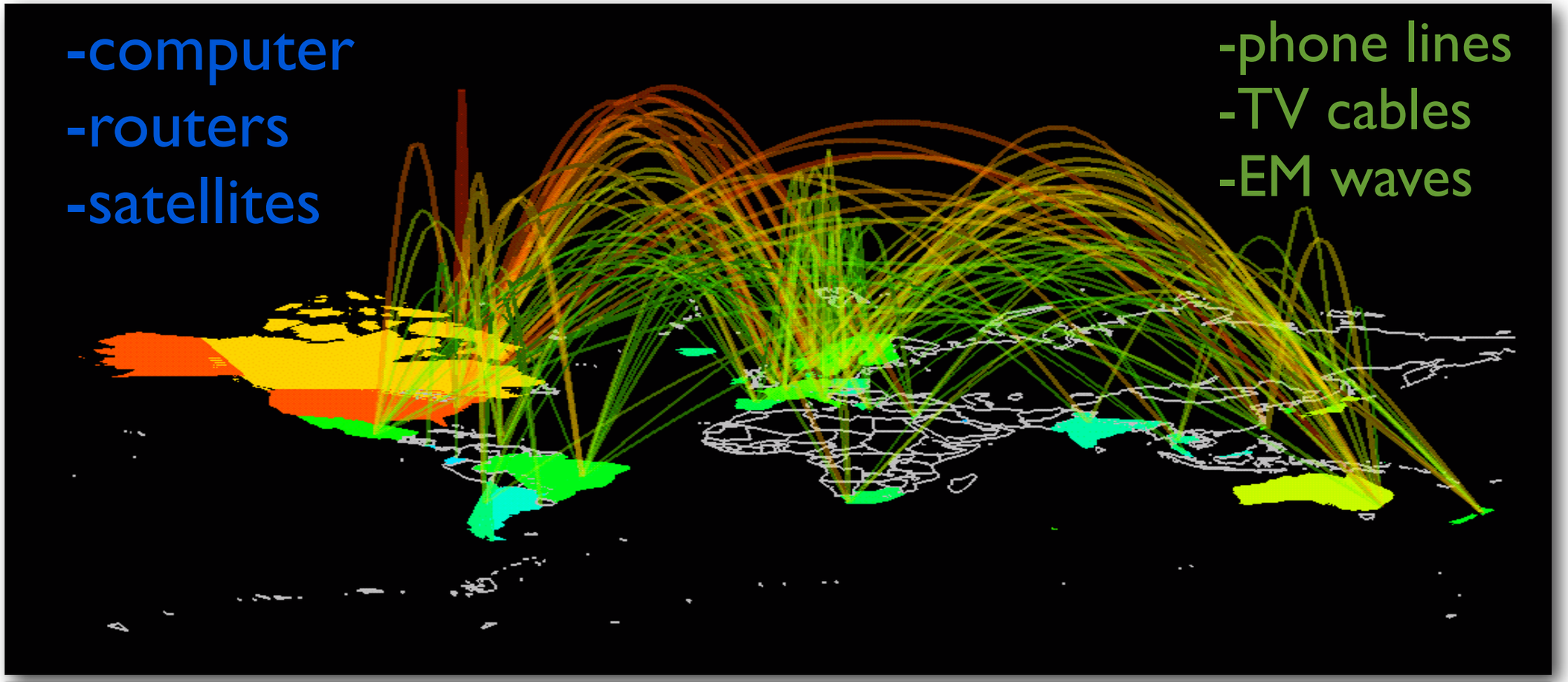



S. Milgram and John Guare: Six Degree of Separation.
Social networks: Many individuals with diverse social interactions between them.

# Milgram's Experiment

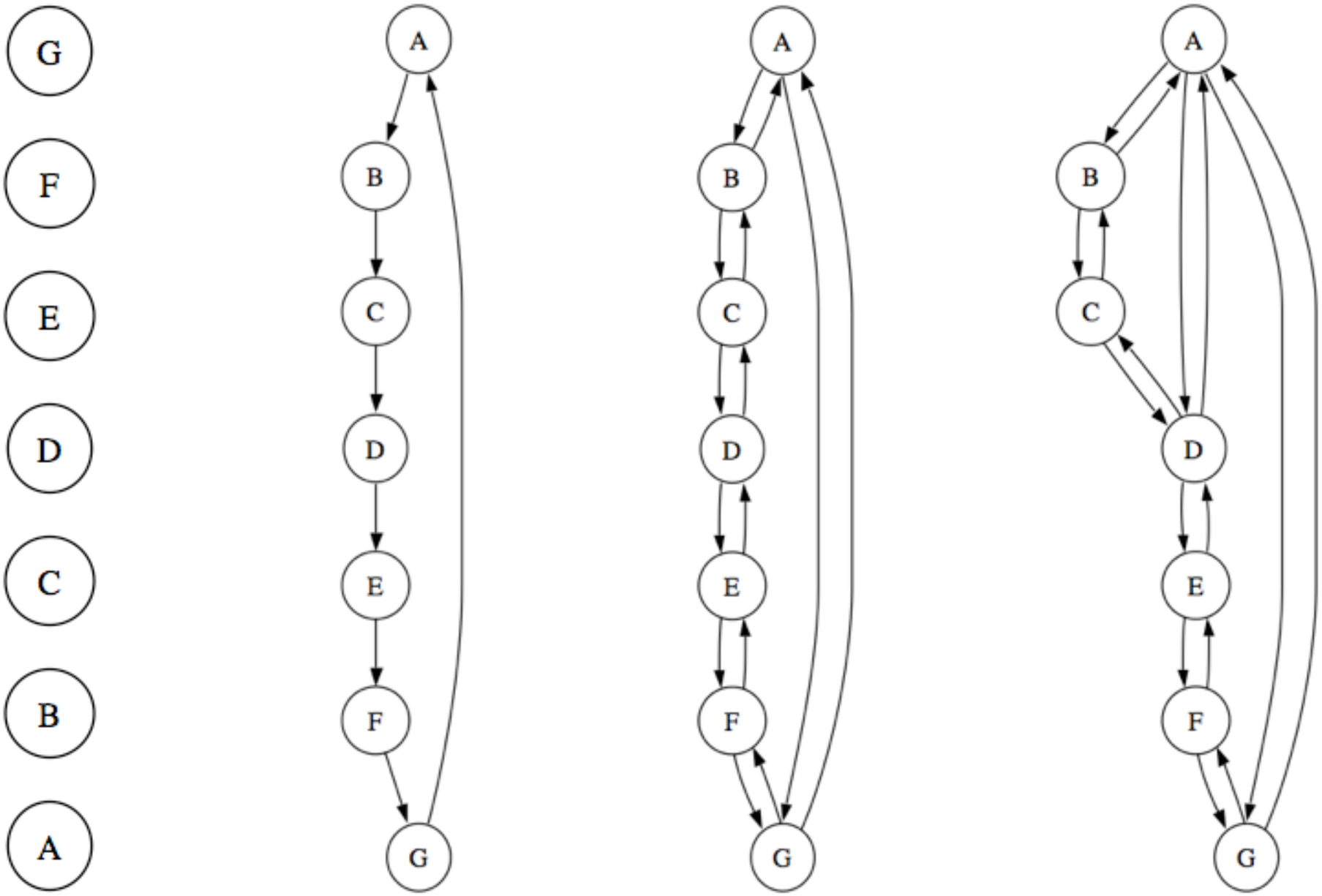
# Social Networks

- The Earth is developing an electronic nervous system, a network with diverse nodes and links.

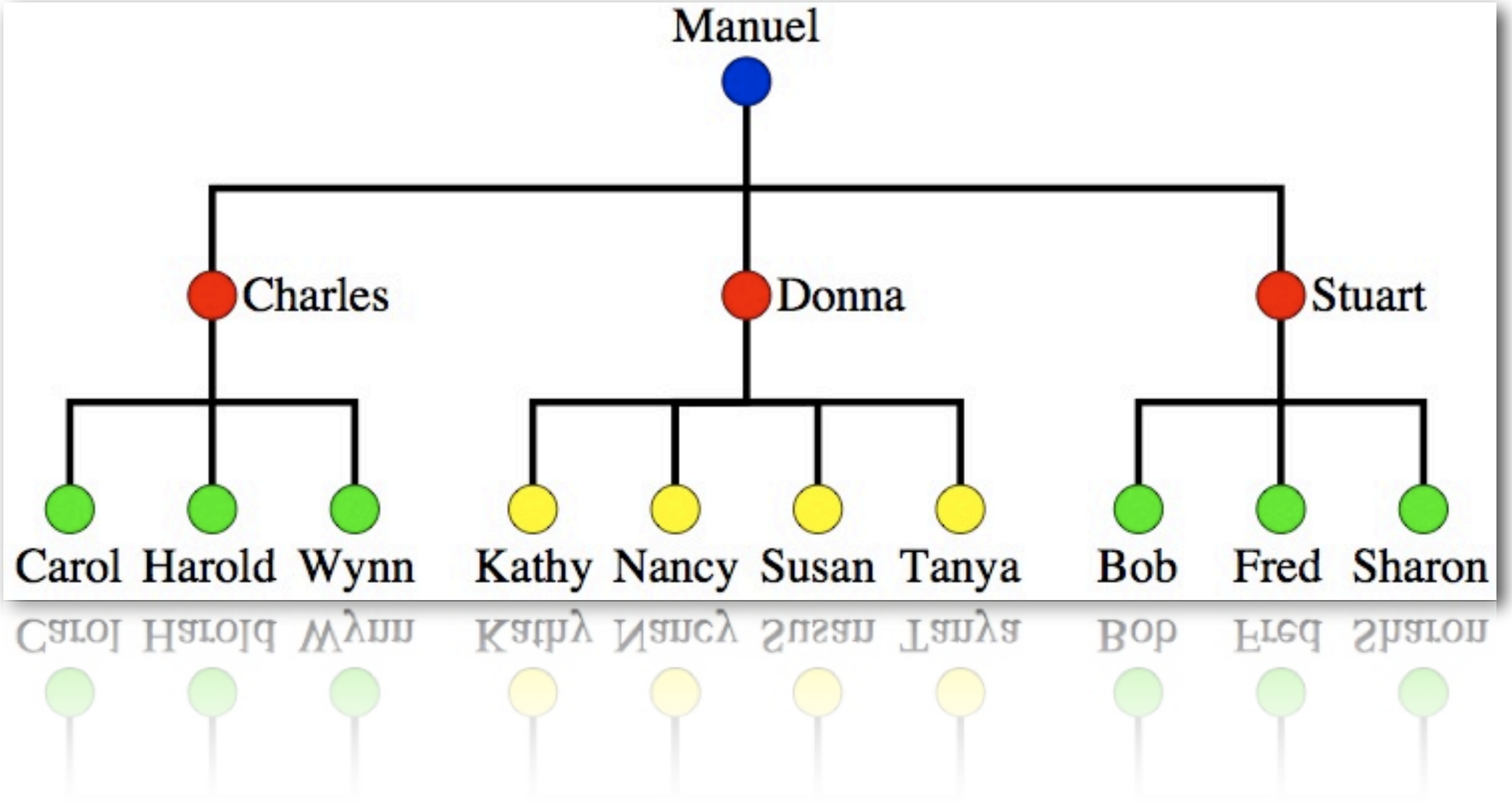



Communication networks: many non-identical components with diverse connections between them.

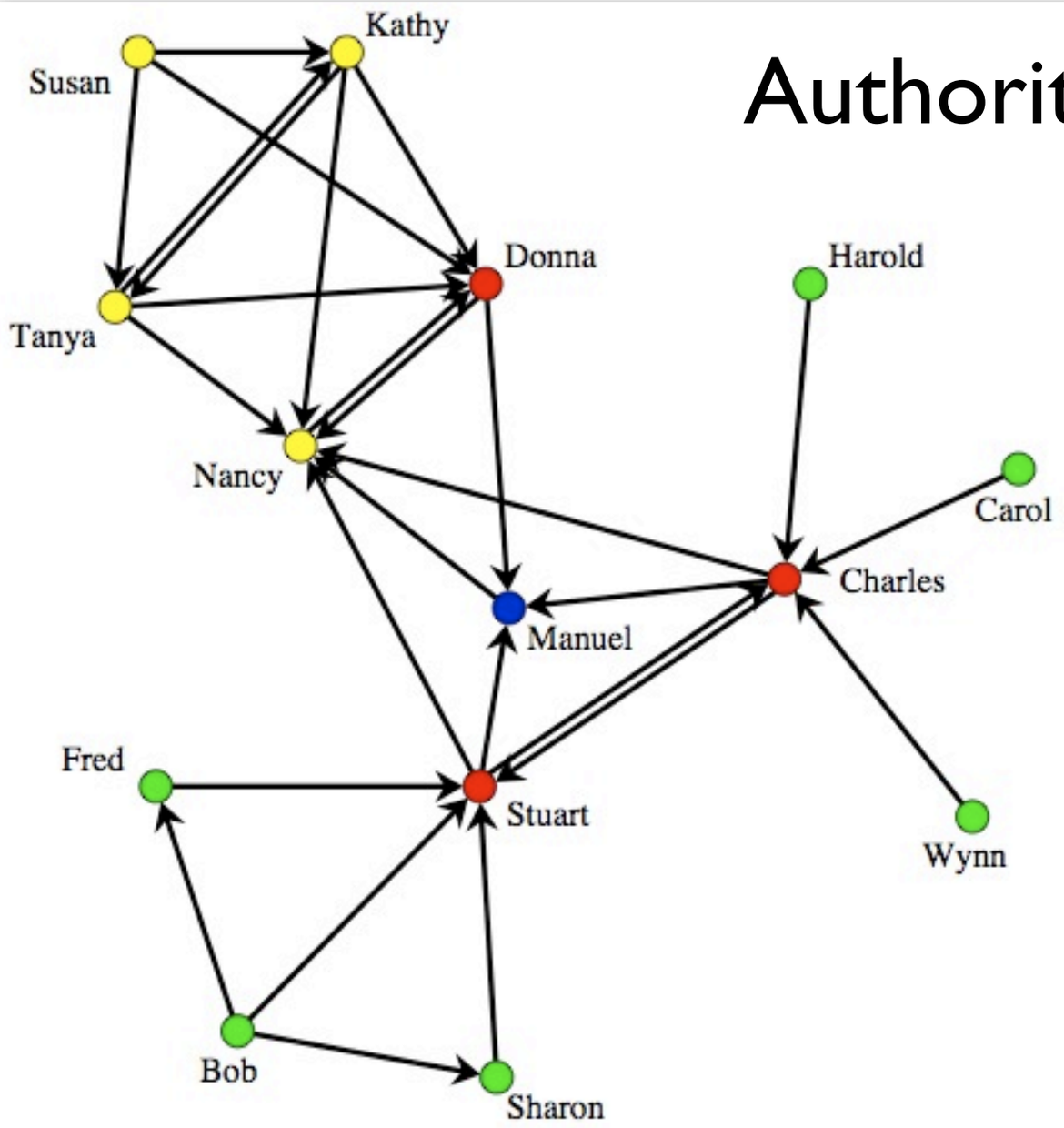
# The Flow of Information



# Organizational Chart



# Social Network Chart



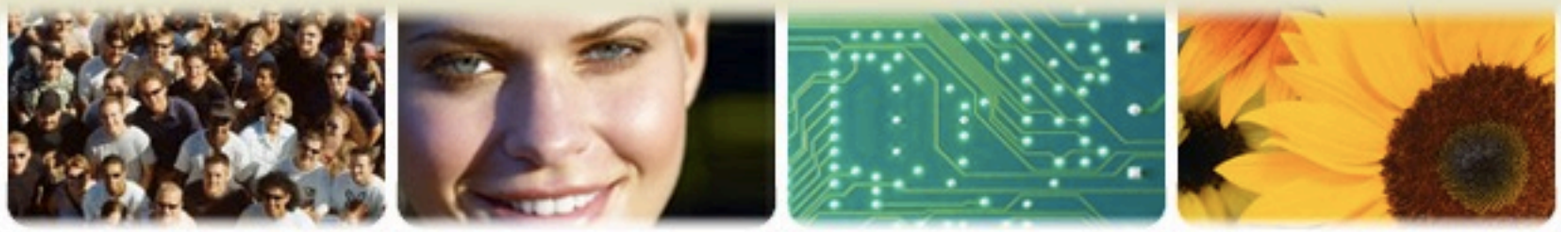

## Authority vs. Importance

| | | |
|---|---|---|
| 1.00 | Nancy | (secretary) |
| 0.66 | Donna | (supervisor) |
| 0.57 | Manuel | (manager) |
| 0.19 | Stuart | (supervisor) |
| 0.17 | Charles | (supervisor) |
| 0.08 | Kathy | (secretary) |
| | Tanya | (secretary) |
| 0.02 | Fred | (auditor) |
| | Sharon | (auditor) |
| 0.00 | Bob | (auditor) |
| | Carol | (auditor) |
| | Harold | (auditor) |
| | Wynn | (auditor) |
| | Susan | (secretary) |

# Social Analytics/Informatics

Contact : Slovenian : FDV

Social Informatics



Search

NAJDI

Advanced search

Login

e-mail

PRIJAVA

New user  Lost password

SOCIAL INFORMATICS | STUDY PROGRAMS | RESEARCH CENTRES | BIBLIOGRAPHY

**Introduction**

- Concept
- History

**Relevant Fields**

- Social Informatics
- Web Content Structure
- Survey Methodology
- Marketing Research
- Social Science Methods
- Applied Statistics
- Official Statistics
- Data Collection
- Library Science
- Information Society
- HC Interaction
- Information Systems
- Social ICT Applications
- Data Modeling & Simulations
- Media & Communication
- Science & Technology
- Arts & Informatics

The notion of social informatics relates to the interaction between society and ICT (information-communication technologies). In its broadest sense it covers:

1. the social consequences of ICT at micro (e.g. social aspects of ICT applications at personal and organisational level) as well as at macro level (e.g. information society studies);
2. the application of ICT in the area of social sciences and social/public sector;
3. the use of ICT as a tool for studying social phenomena (within social science methodology).

Graphical presentation is here>>

## News

07.12.09 Information Society Free Virtual Library
02.12.09 Job offer: Professor in Social Informatics
01.12.09 Call for papers to "New technologies and data collection in social sciences"
09.11.09 Call for Papers "IASSIST 2010"
27.10.09 Job offer: Associate Professor Position - Department of Social Informatics

archive

## Blogs

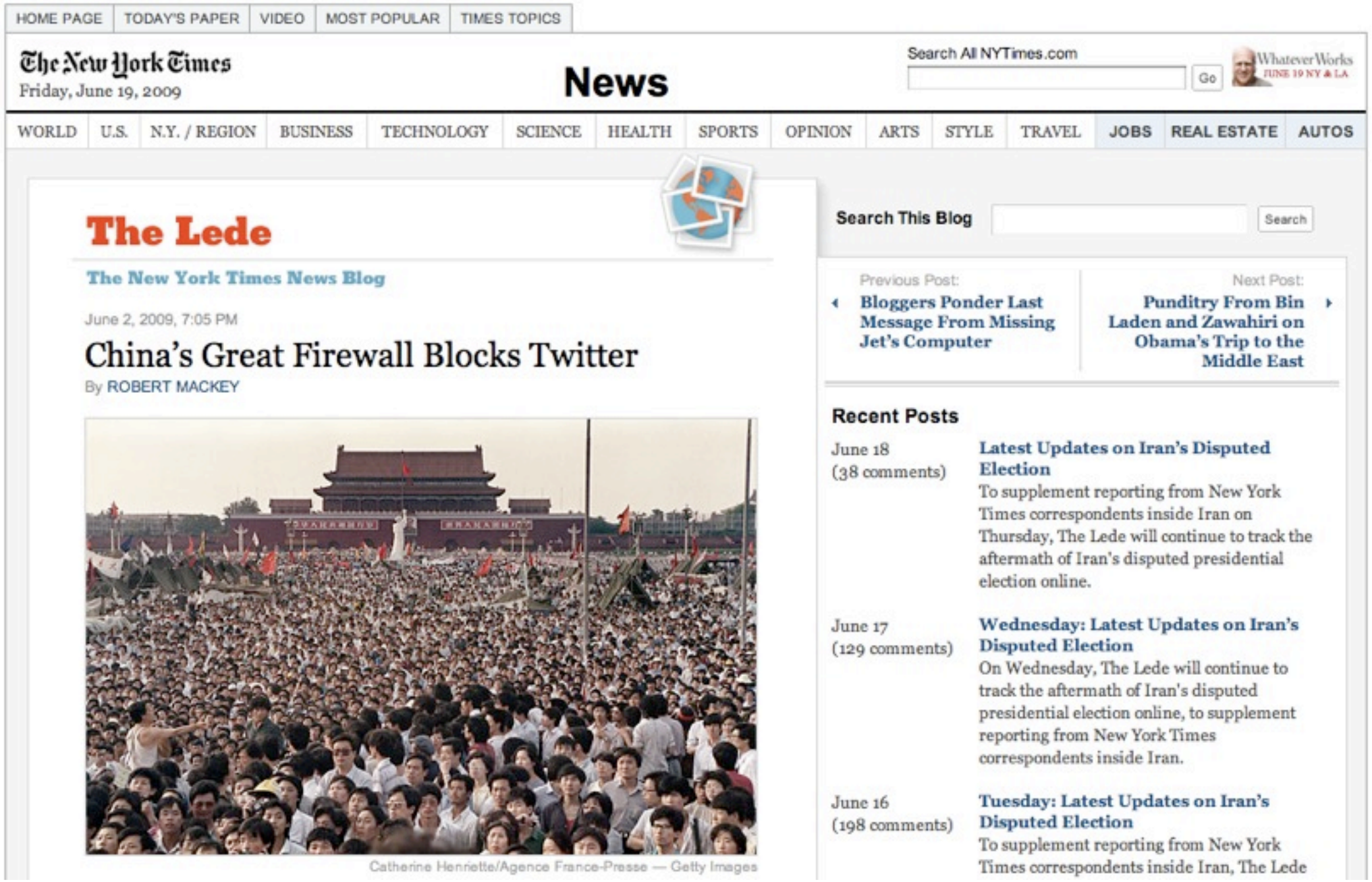
- Social Informatics by Michael Tyworth
- Social Informatics - a knol by Per Arne Godejord
- Pixelcharmer Field Notes: Social Informatics
- Journal of Social Informatics Blog
- Social Informatic - International Blog

more

## Associations

- The European Survey Research Association
- Council of American Survey Research Organizations (CASRO)
- Marketing Research Association
- International Communications

# Politics


HOME PAGE
TODAY'S PAPER
VIDEO
MOST POPULAR
TIMES TOPICS
The New York Times
Friday, June 19, 2009
News
Search All NYTimes.com
Go
WhateverWorks
JUNE 19 NY & LA
WORLD
U.S.
N.Y. / REGION
BUSINESS
TECHNOLOGY
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HEALTH
SPORTS
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Punditry From Bin Laden and Zawahiri on Obama's Trip to the Middle East
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June 18
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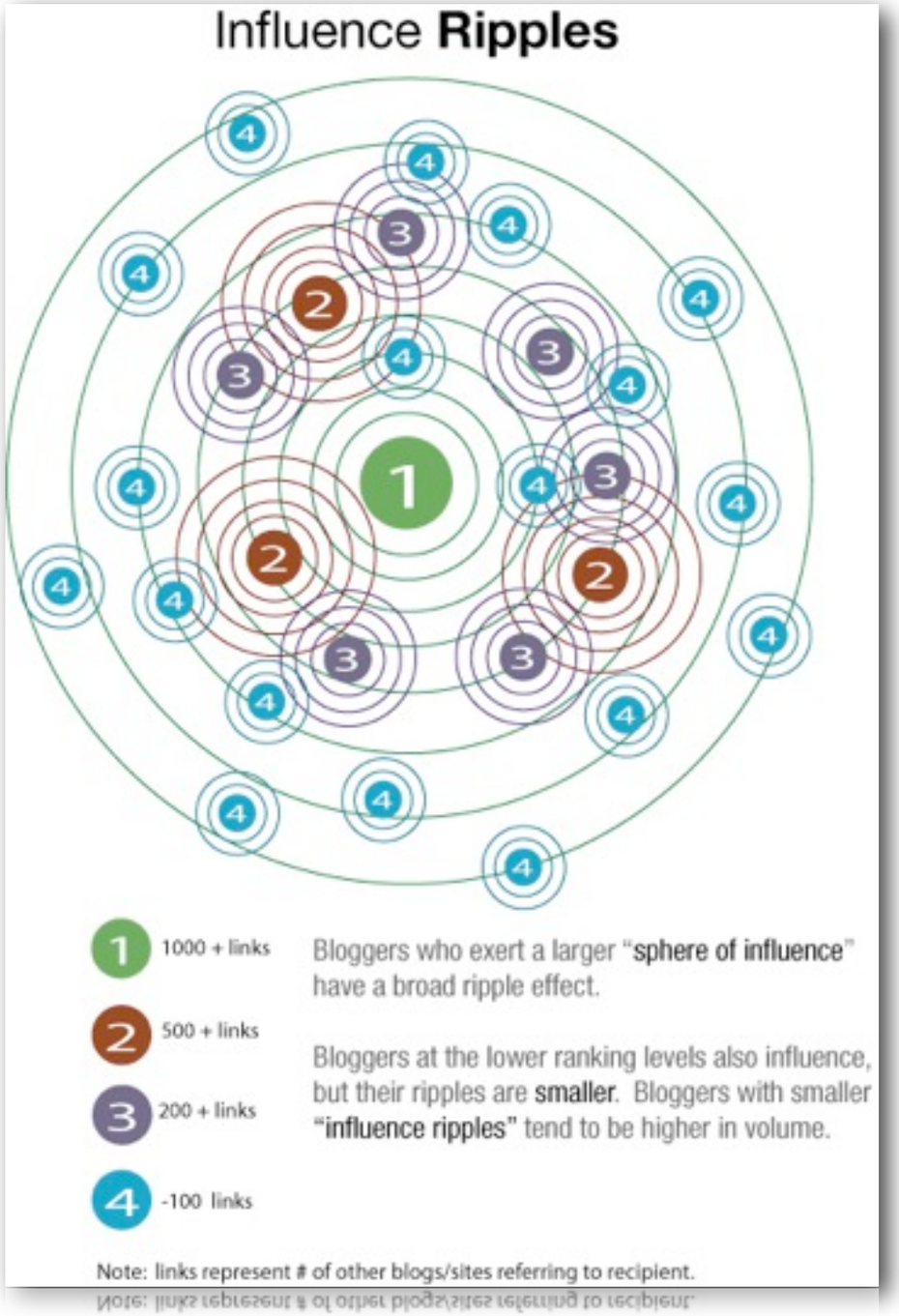
Latest Updates on Iran's Disputed Election
To supplement reporting from New York Times correspondents inside Iran on Thursday, The Lede will continue to track the aftermath of Iran's disputed presidential election online.
June 17
(129 comments)
Wednesday: Latest Updates on Iran's Disputed Election
On Wednesday, The Lede will continue to track the aftermath of Iran's disputed presidential election online, to supplement reporting from New York Times correspondents inside Iran.
June 16
(198 comments)
Tuesday: Latest Updates on Iran's Disputed Election
To supplement reporting from New York Times correspondents inside Iran, The Lede

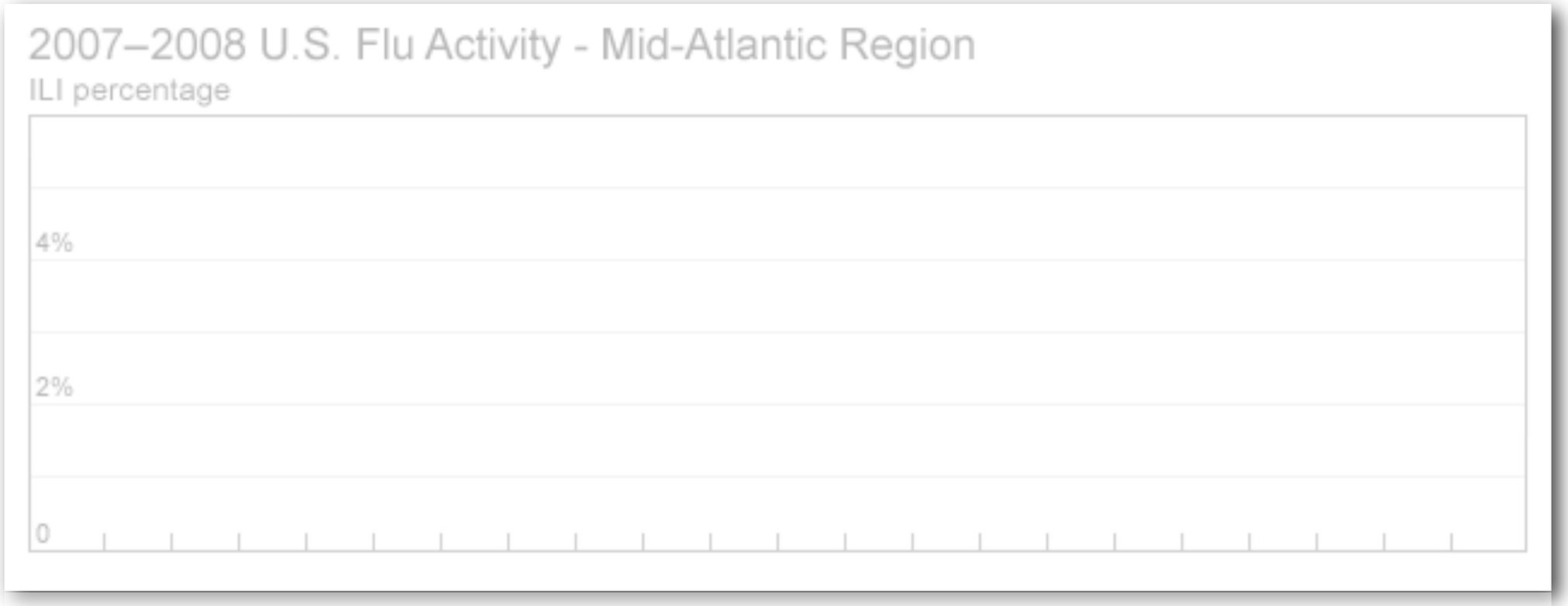
# Commerce

- Social marketing
- Who are the brokers?
- Who can exert the most influence on buying/selling?
- How much should one advertise?



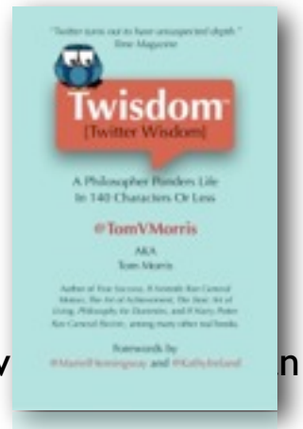
# Public Health

- People's behavior can be monitored
- What is on people's mind translates to search queries
- Google predicts flu trends...



# Twitter Pop Culture

- Twisdom: Twitter Wisdom
  - A Philosopher Ponders Life in 140 Characters or Less
    - "I don't know the key to success, but the key to failure is trying to please everybody." Bill Cosby Do what you know in your soul is right!
    - It is a miserable state of mind to have few things to desire, and many things to fear. – Francis Bacon
- The Longest Poem In the World-the awesome twitter poem! 956,644 verses this morning and ~4,000 a day!



# The YouTube Generation

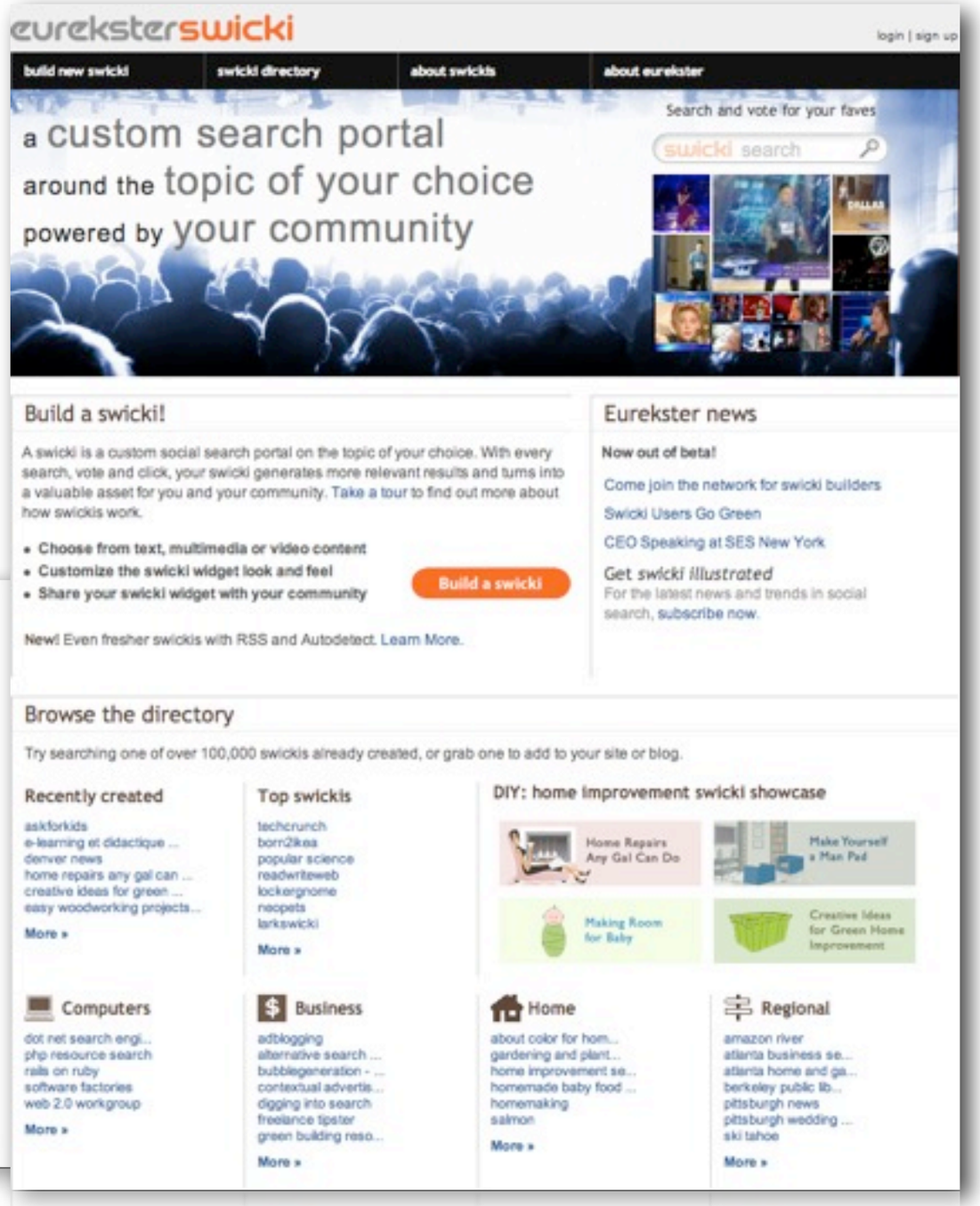
# The Age of FaceBook

# Social Networking Sites

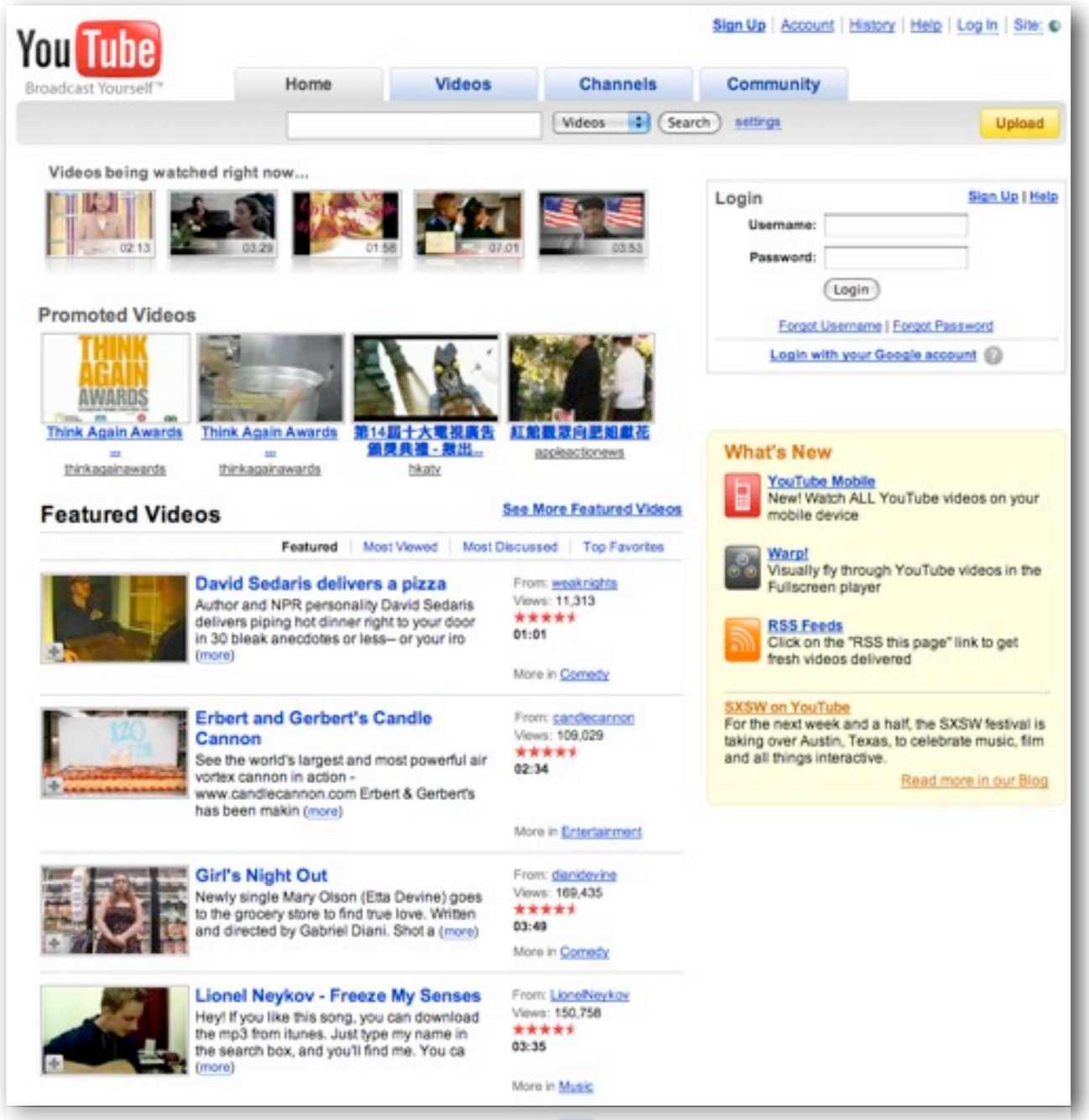
- Example of Social Networking Sites: FaceBook, MySpace, Blogger, QQ, etc.

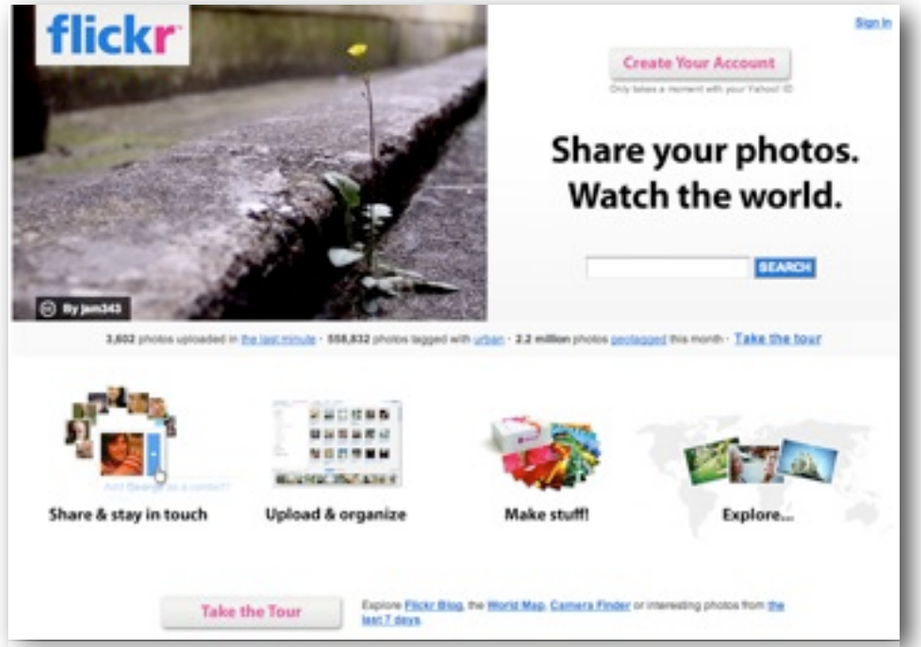
# Social Search

- Social Search Engine
- Leveraging your social networks for searching

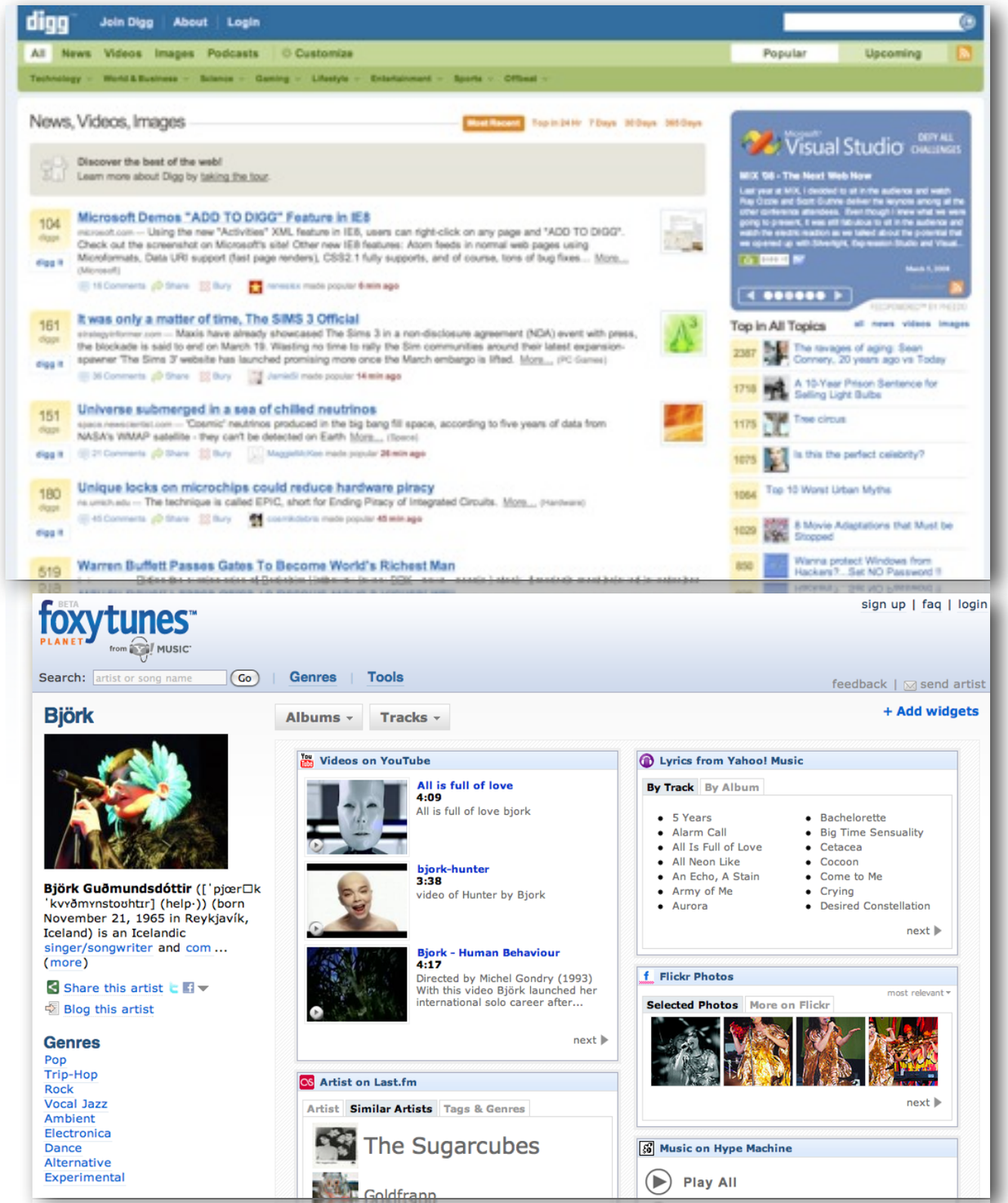


# Social Media

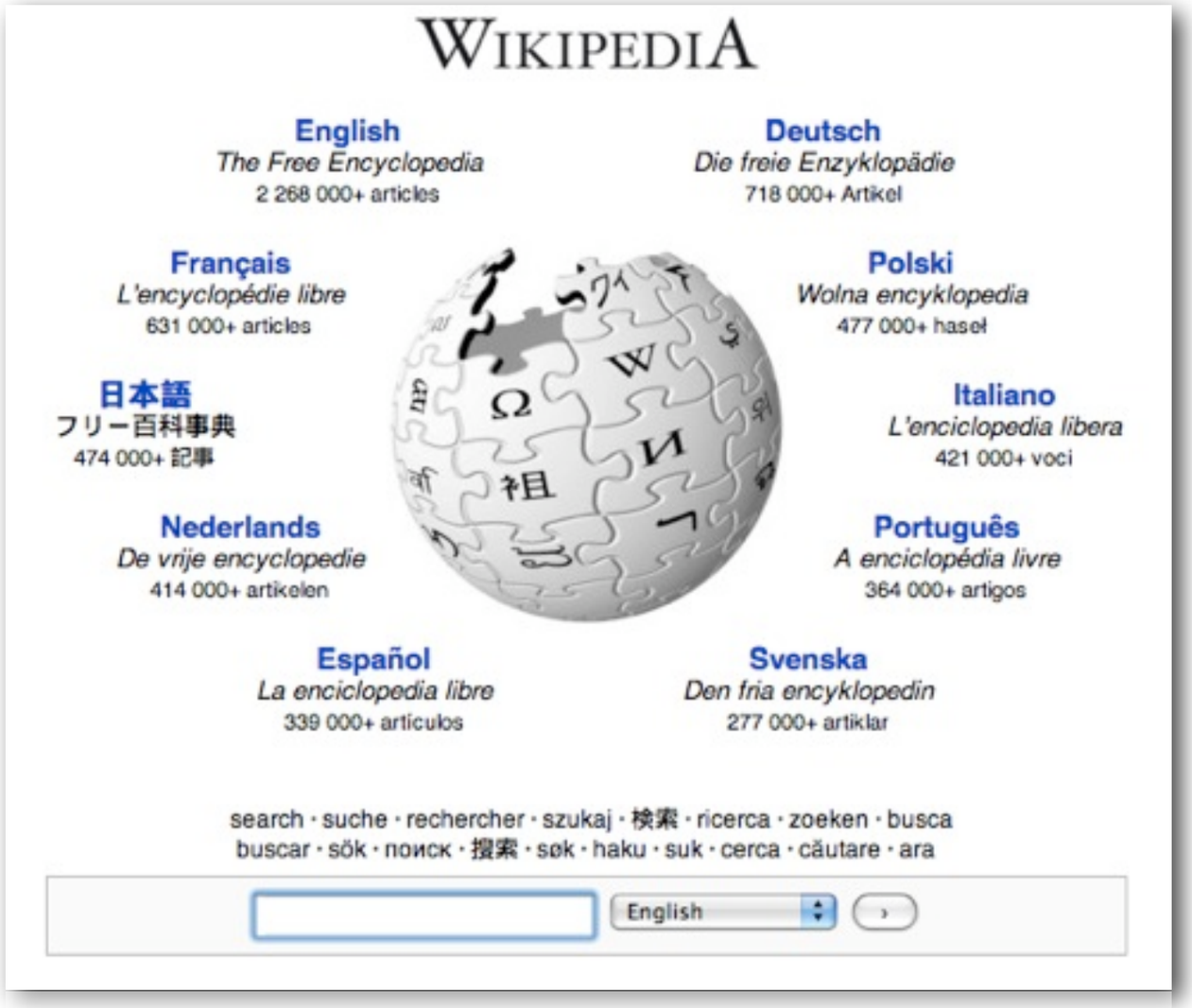


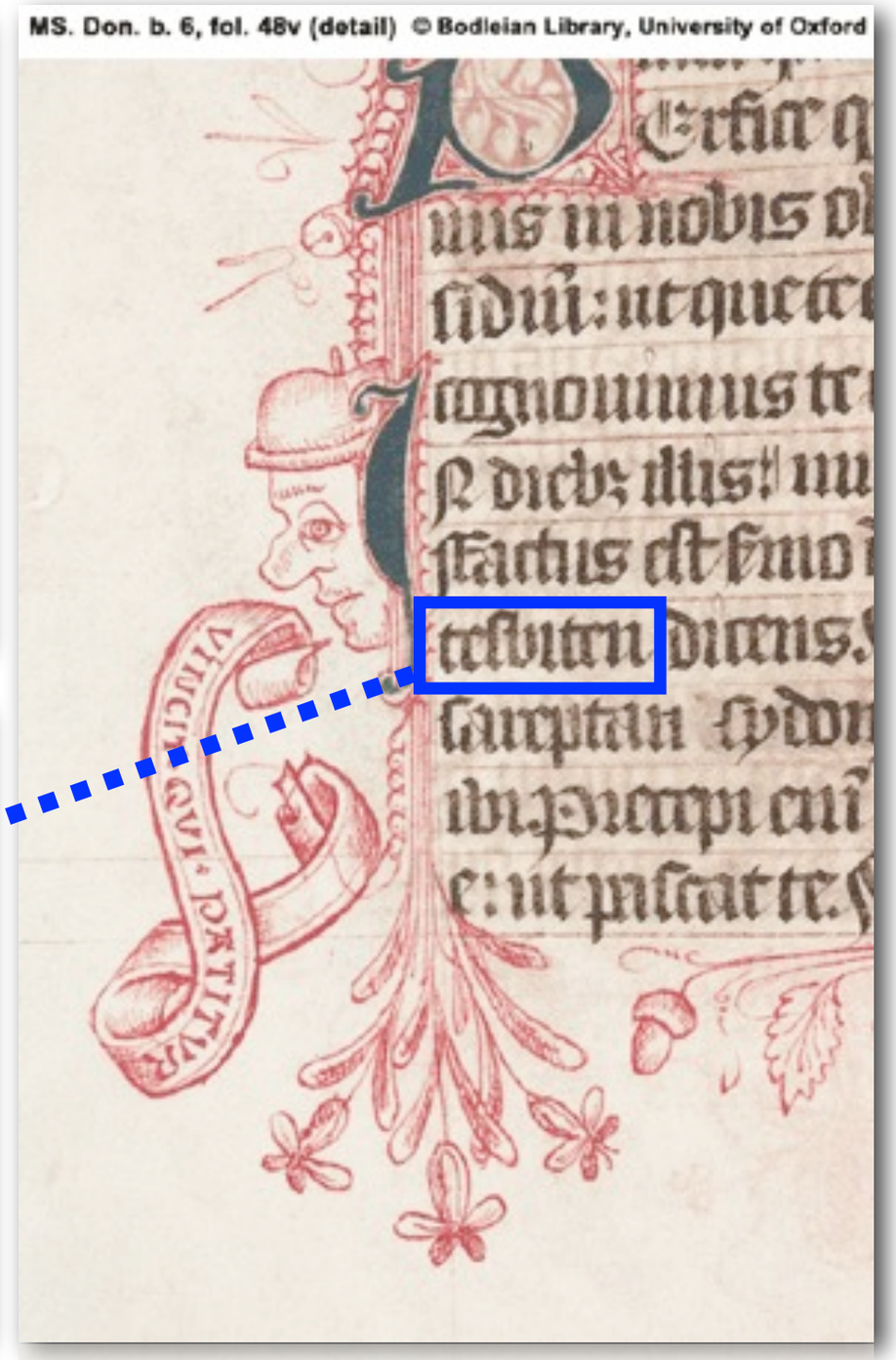
# Social News/Mash Up



# Social Knowledge Sharing

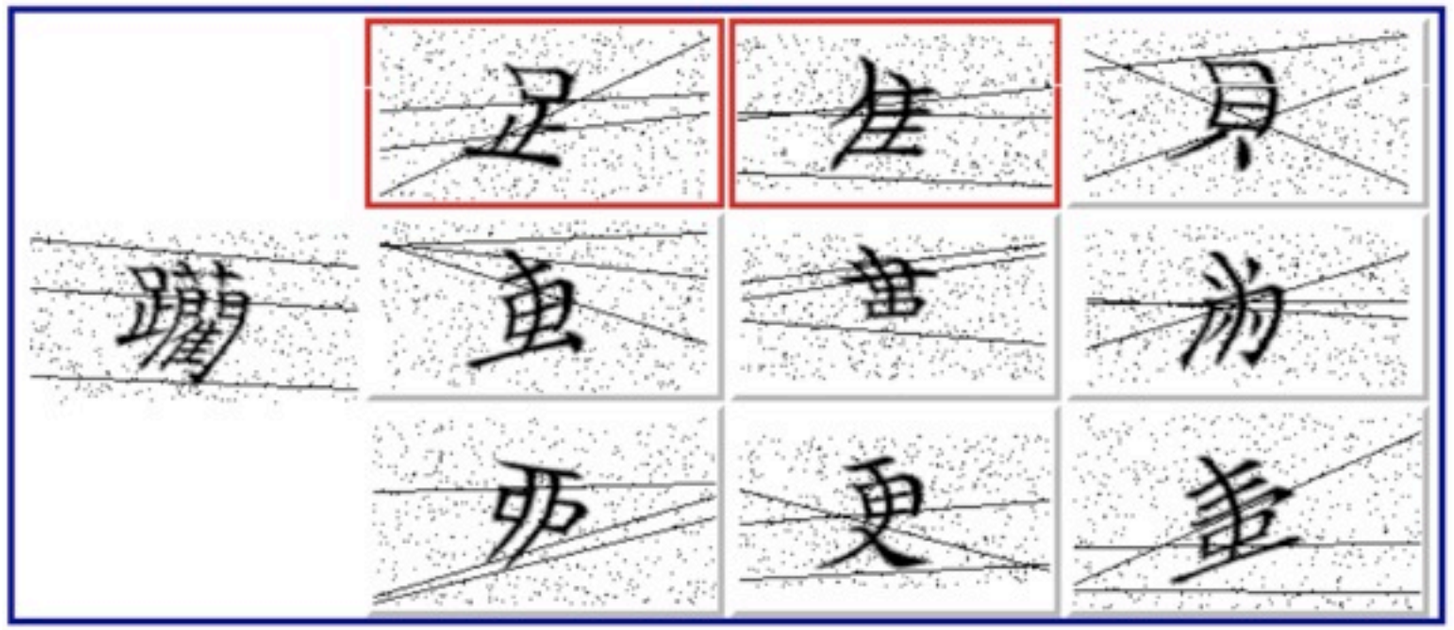


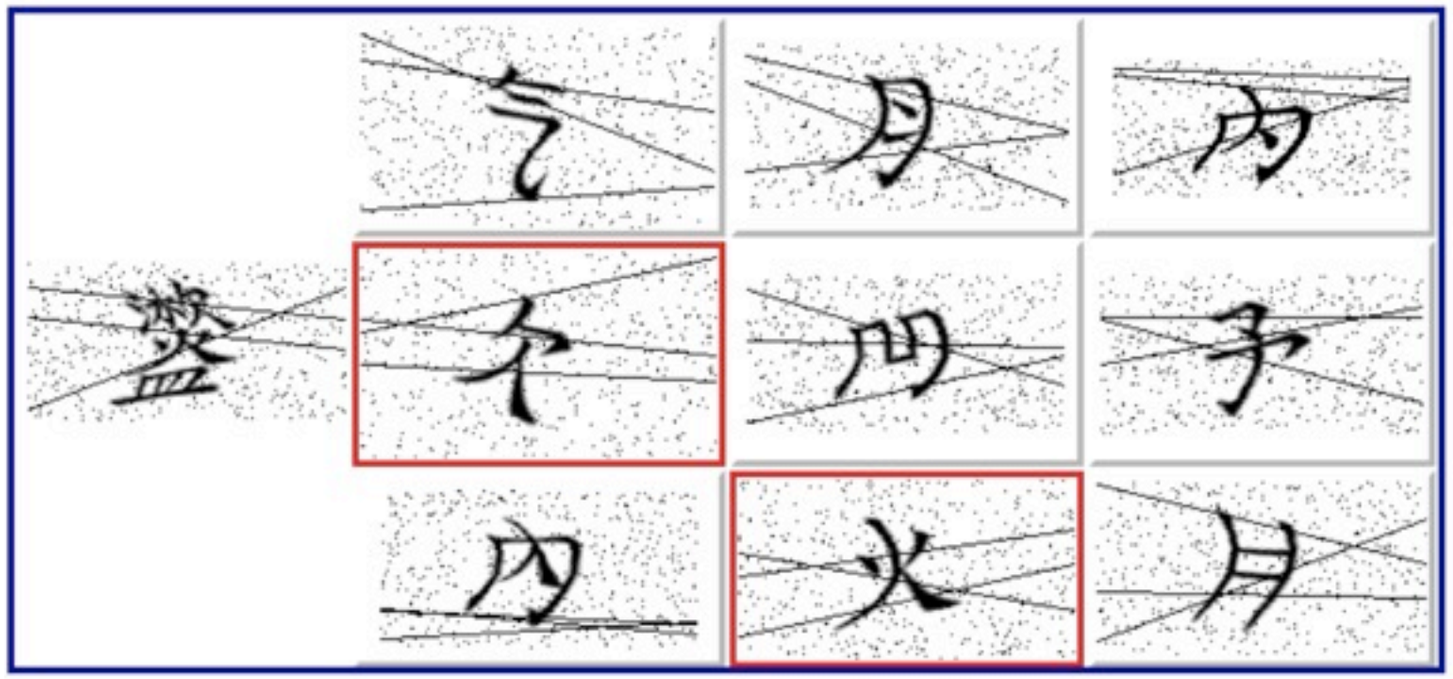
# Social/Human Computation



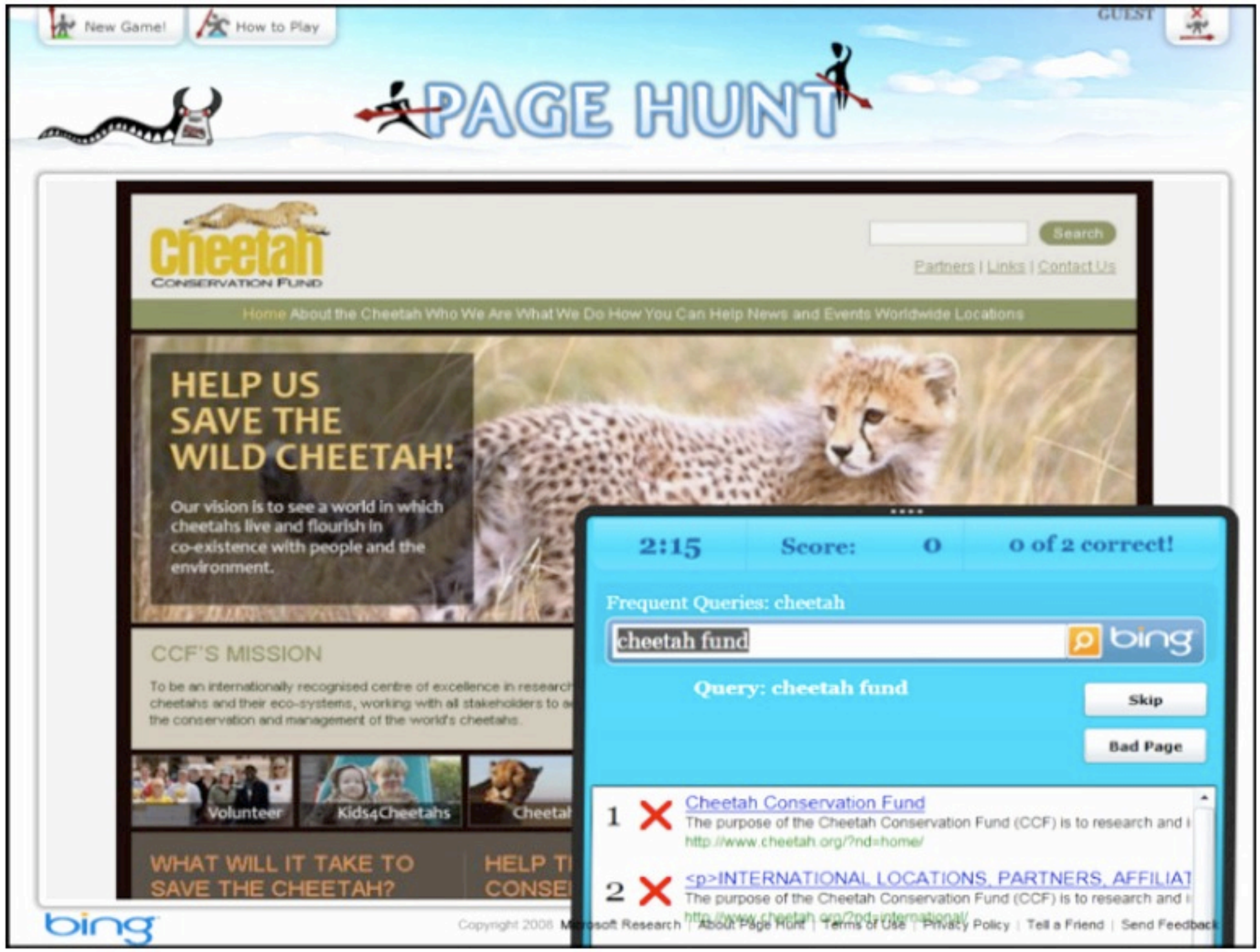
# Chinese CAPTCHA

Ling-Jyh Chen, Institute of Information Science, Academia Sinica, Taipei, Taiwan





# Human Computation

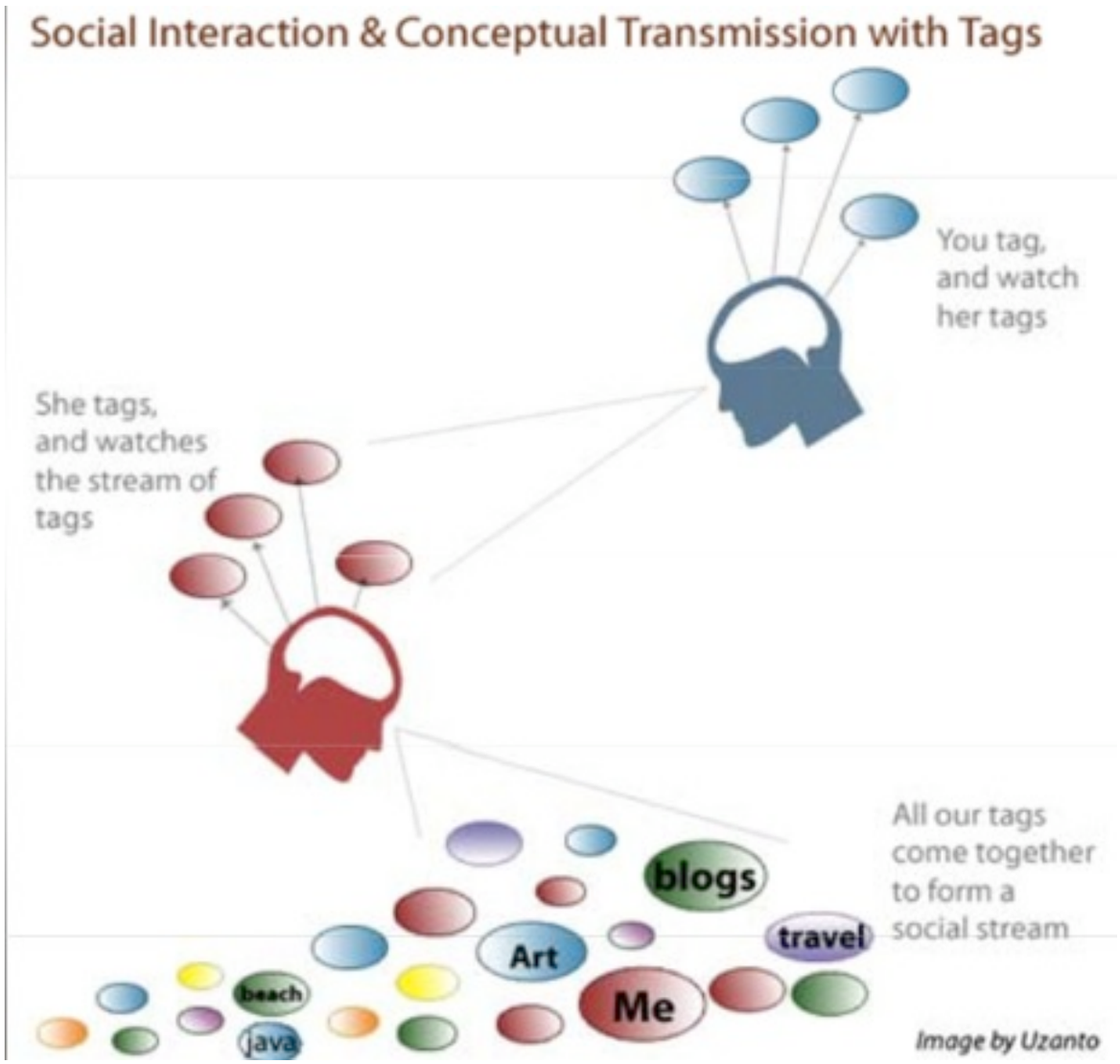


# Social Bookmarking

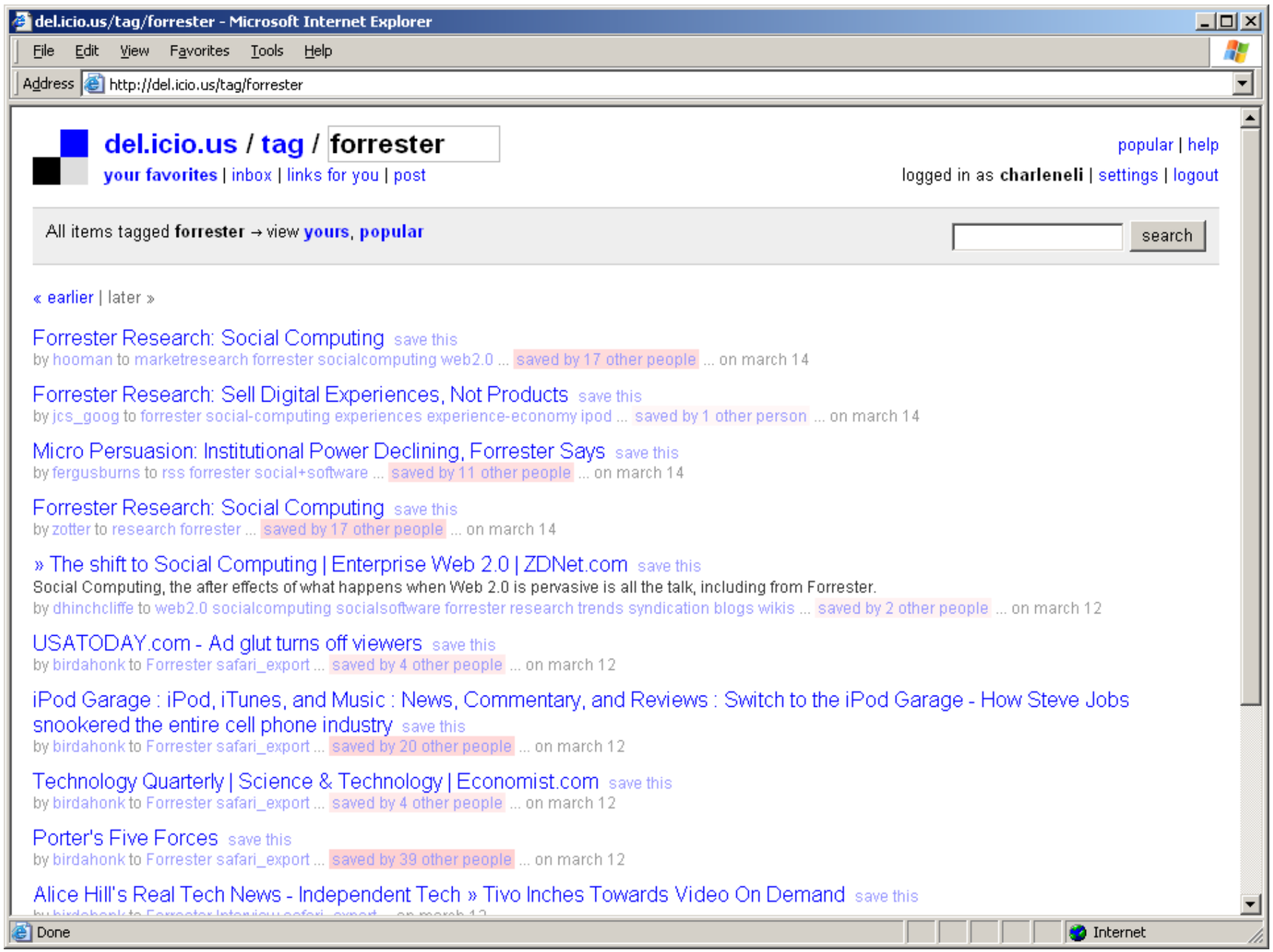
- What is a tag?
  - Descriptive metadata
  - A keyword or term associated with or assigned to a piece of information
  - User defined, created and shared
  - Many web users do it every day, with very little conscious awareness that they are "cataloging"
- What gets tagged?
  - Pictures, blog posts, video clips, catalog entries, just about anything...

# Social Bookmarking

- Share one's tags
- Make the individual browsing experience a social one

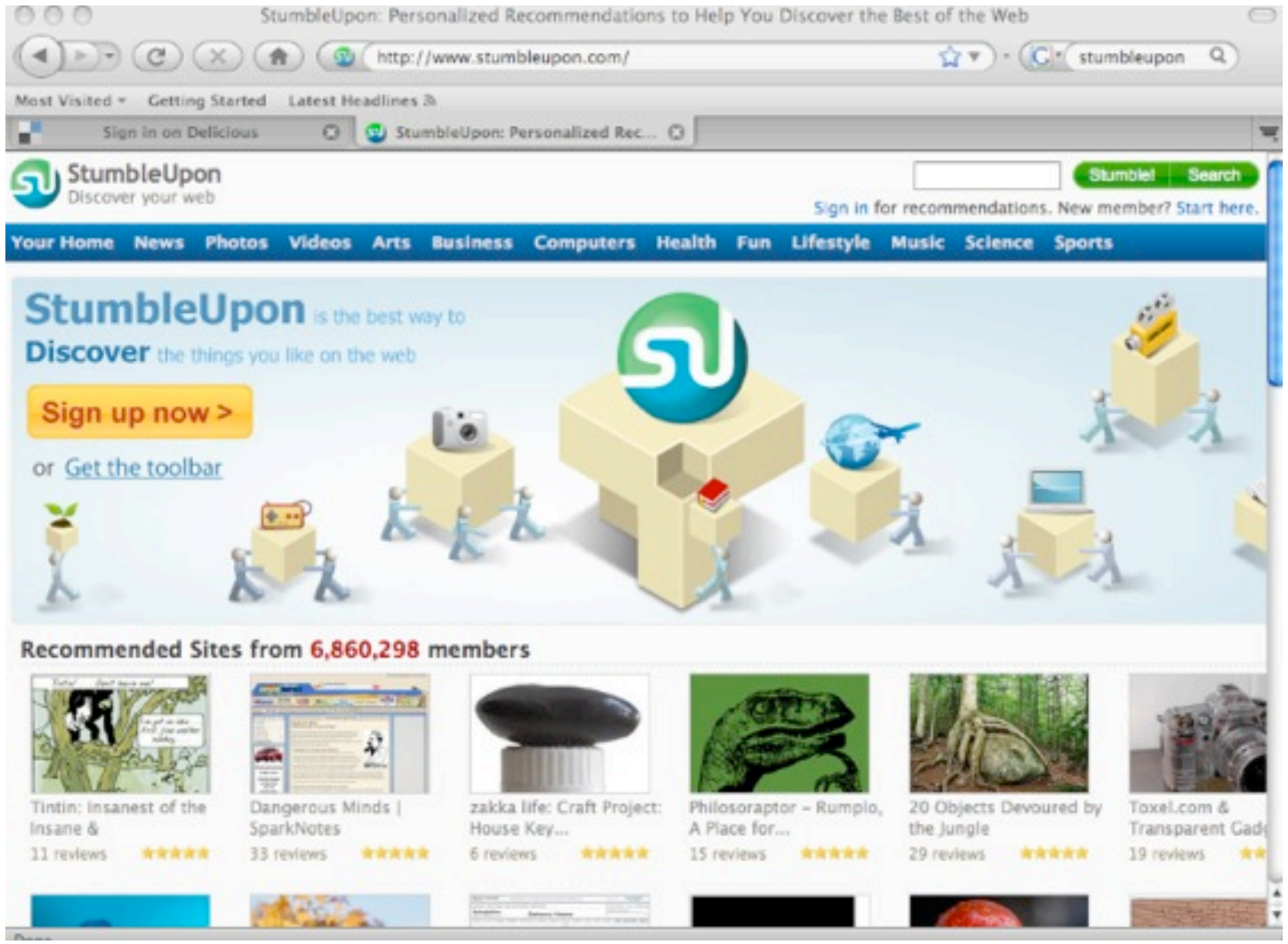


# Social Bookmarking in del.icio.us



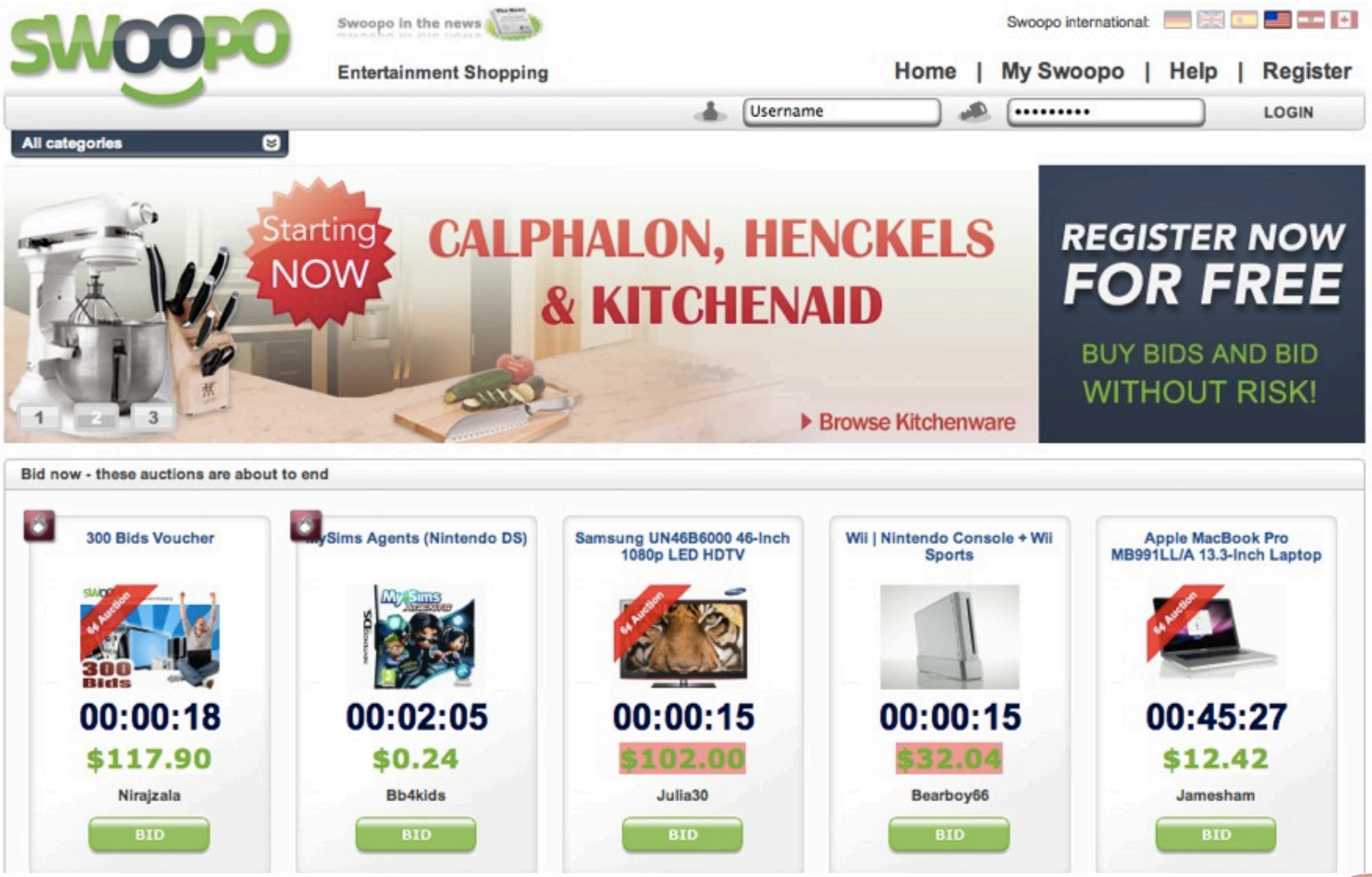
# Social Bookmarking in StumbleUpon

StumbleUpon allows users to discover and rate web pages, photos, and videos. It chooses which web page to display based on the user's ratings of previous pages, ratings by his/her friends, and by the ratings of users with similar interests.



# Tagging is Everywhere

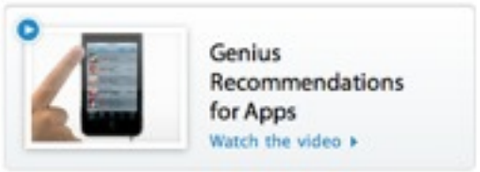
# Social Entertainment



# Social Recommendations

## Genius Recommendations for Apps NEW

There are tens of thousands of apps in the App Store, with more added every day. A new feature of iPod touch makes finding cool new apps even easier. It's Genius for apps, and it works just like Genius for your music. Tap the Genius icon and get recommendations for apps that you might like based on apps you and others have downloaded.



## Genius Playlists

Say you're listening to a song you really like and want to hear other tracks that go great with it. The Genius feature finds other songs on your iPod touch that sound great with the one you were listening to and makes a Genius playlist for you. Listen to the playlist right away, save it for later, or even refresh it and give it another go. Count on Genius to create a mix you wouldn't have thought of yourself.

## Genius Mixes NEW

Now the Genius feature is even more powerful. Introducing Genius Mixes. All you do is sync iPod touch to iTunes, and Genius automatically searches your library to find songs that sound great together. Then it creates multiple mixes you'll love. These mixes are like channels programmed entirely with your music.

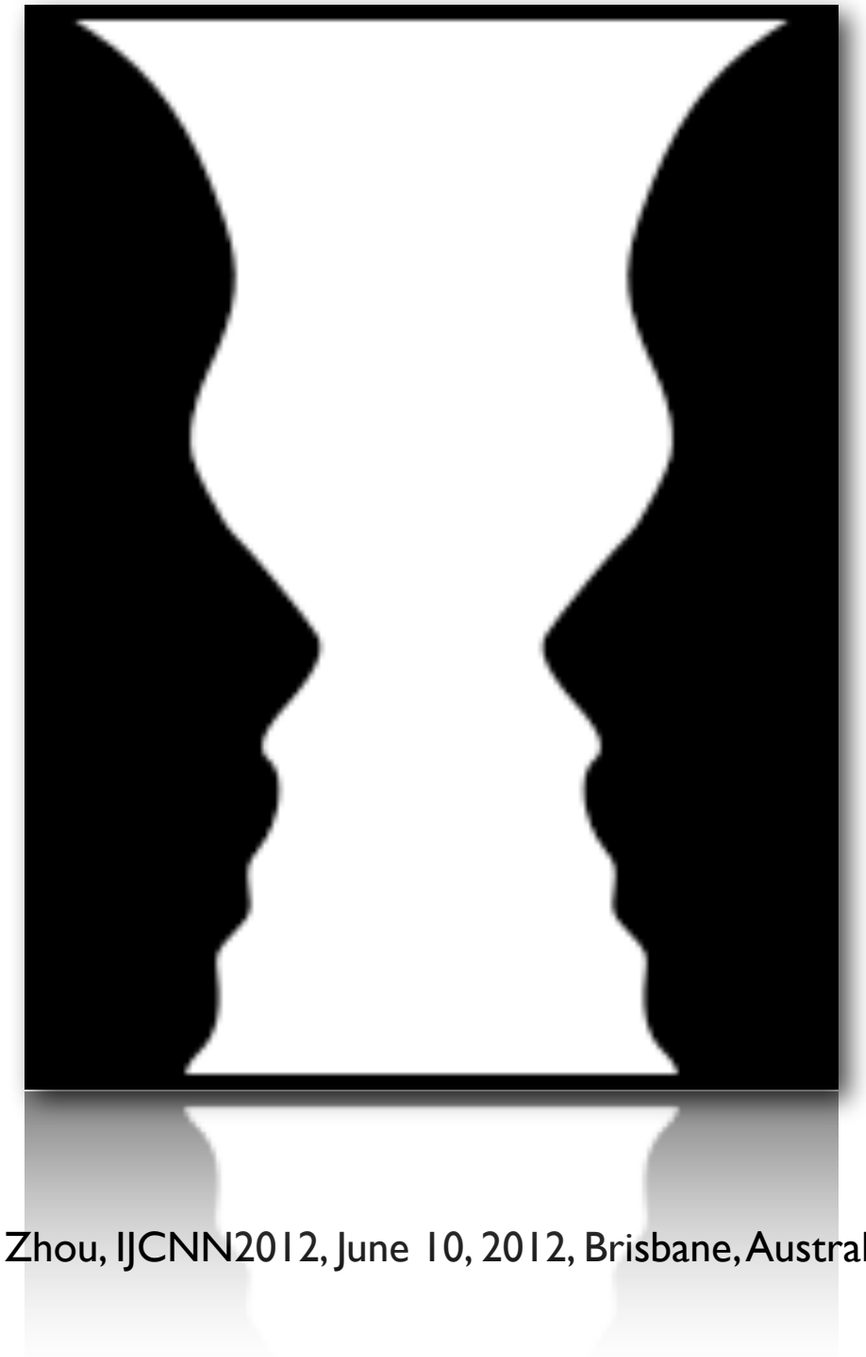
# Web 2.0 Revolution

- Glocalization-think globally and act locally!
- Weblication-Web is the application!
- Three C's

**C**onnectivity

**C**ollaboration

**C**ommunities



# Social Relations

crew

teams

populations

squad

organizations

cohorts

markets

communities

partners

groups

binary

cardinal

integer

real

presence

identity

social role

reputation

expertise

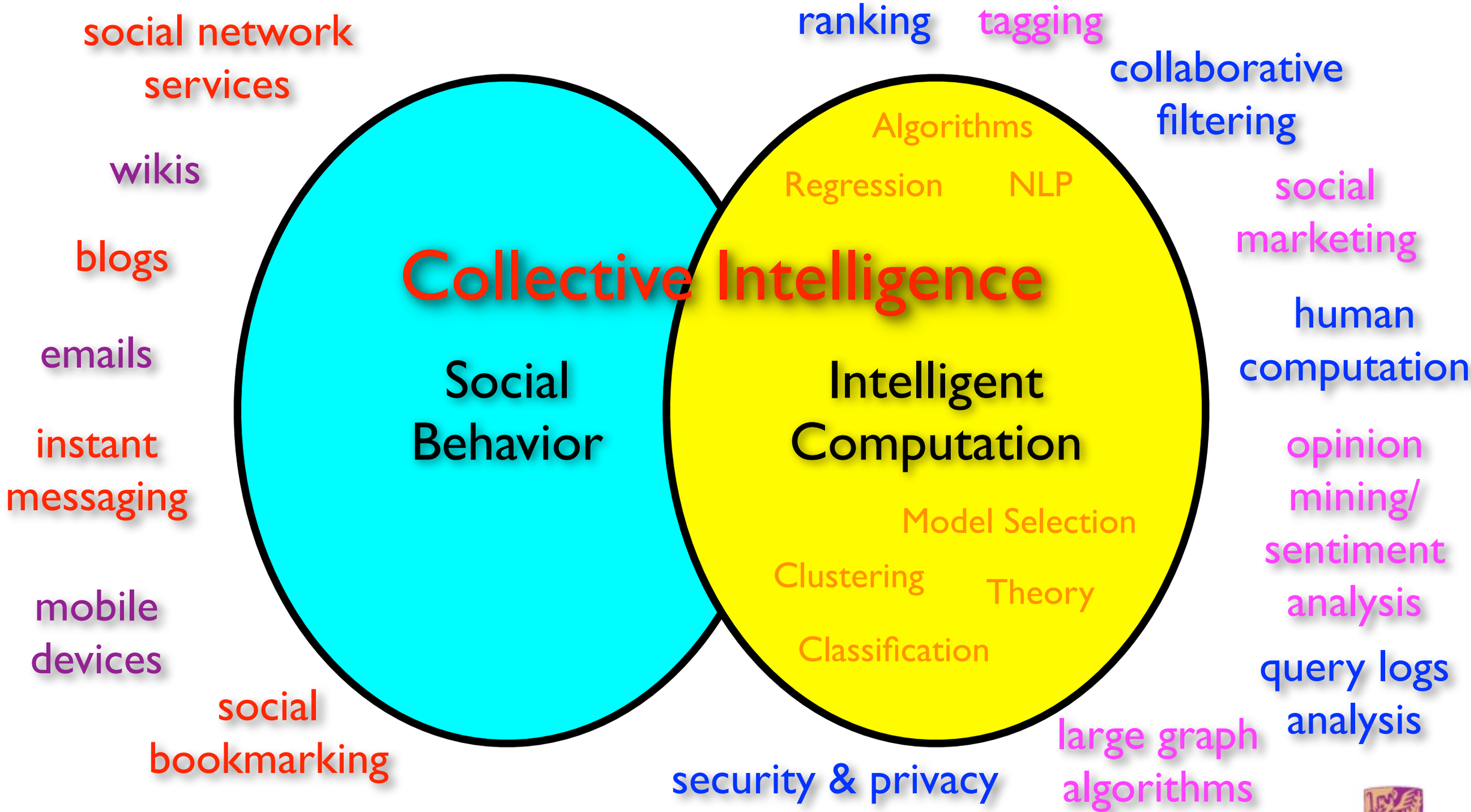
trust

ownership

accountability

knowledge

# Social Computing

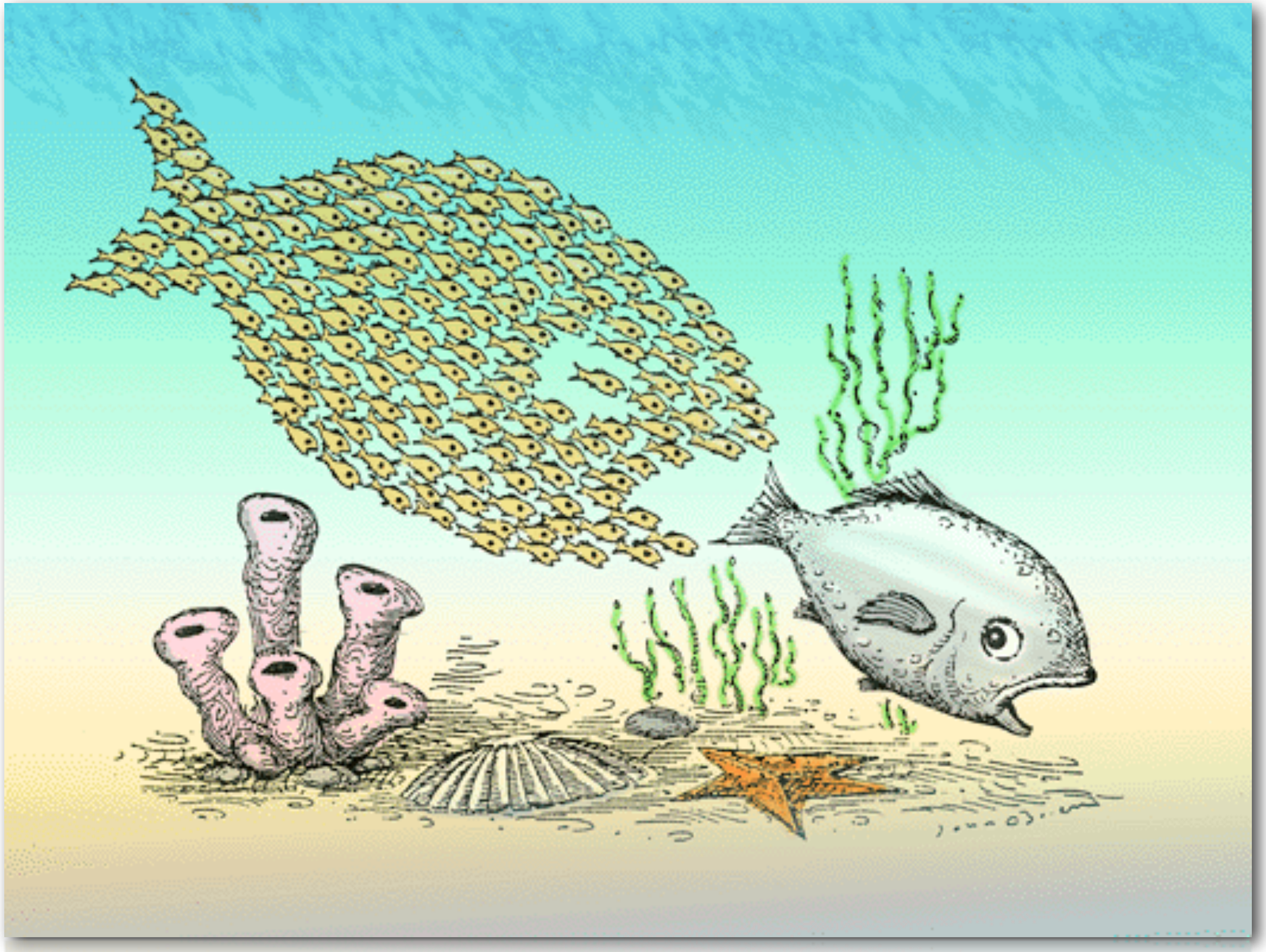


# Emerging Issues

- Theory and models
- Seach, mining, ranking and recommending of existing information, e.g., spatial (relations) and temporal (time) domains
    - Dealing with partial and incomplete information, e.g., collaborative filtering, ranking, tagging, etc.
- Scalability and algorithmic issues
- Security and privacy issues
- Monetization of social interactions

# Topics

- Introduction
- Matrix factorization models
- Social network analysis
  - Link analysis
  - Community detection
- Community question answering



# Q & A