

# The Era of Social Computing

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# Sand from Centuries Past Send Future Voices Fast



## The Nobel Prize in Physics 2009

"for groundbreaking achievements concerning the transmission of light in fibers for optical communication"

"for the invention of an imaging semiconductor circuit – the CCD sensor"



Photo: Richard Epworth

**Charles K. Kao**



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**Willard S. Boyle**



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**George E. Smith**

Nobelprize.org

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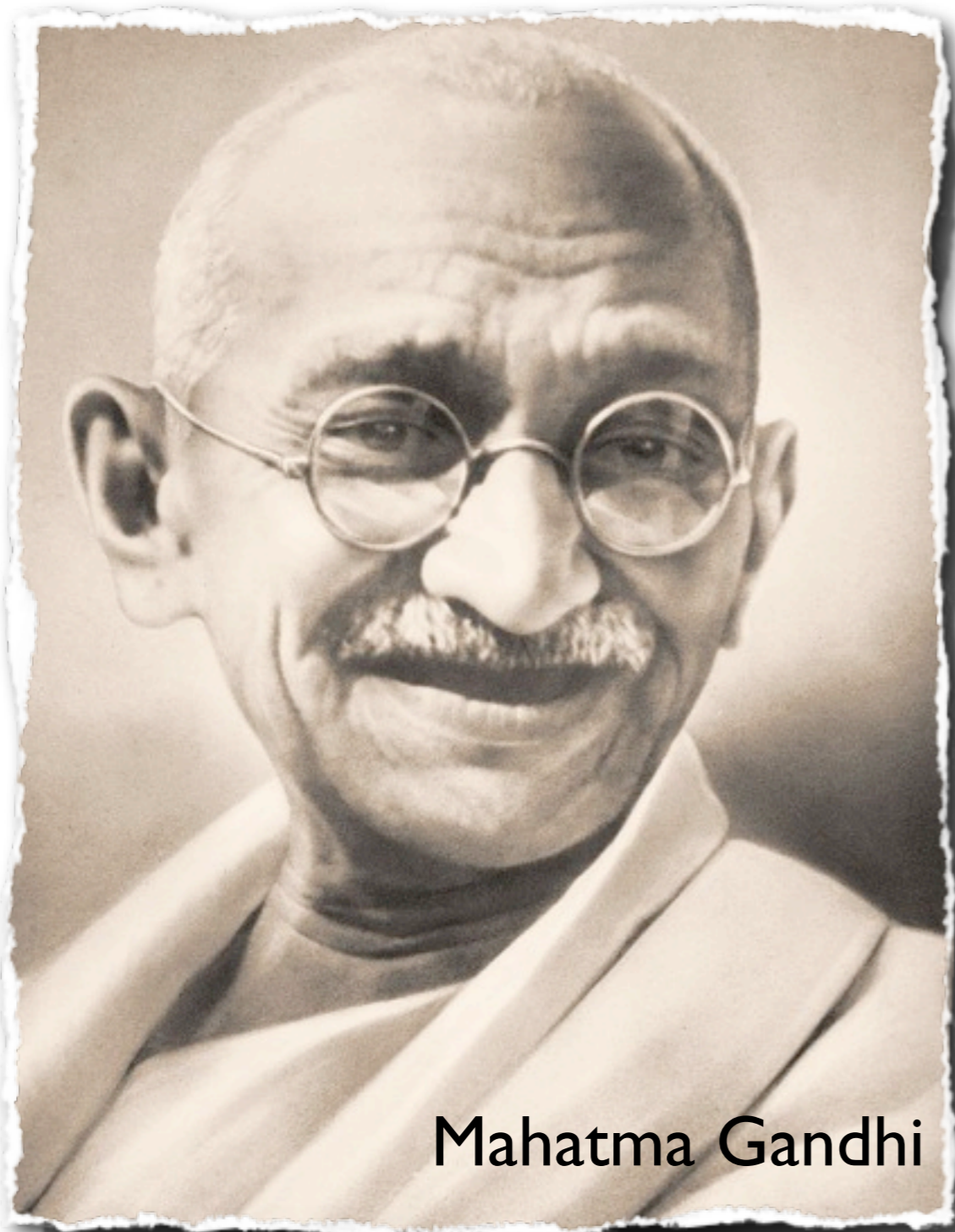
**Video Info**

**Nobel Lecture by Charles K. Kao (27 minutes)**  
Charles K. Kao's Nobel Lecture was held on 8 December 2009, at Aula Magna, Stockholm University, by his wife, Mrs Gwen Kao. They were introduced by Professor Joseph Nordgren, Chairman of the Nobel Committee for Physics.

Ratings ★★★★★ (86)  
Your rating ★★★★★

Download this video  
High quality (0 MB)  
Low quality (0 MB)





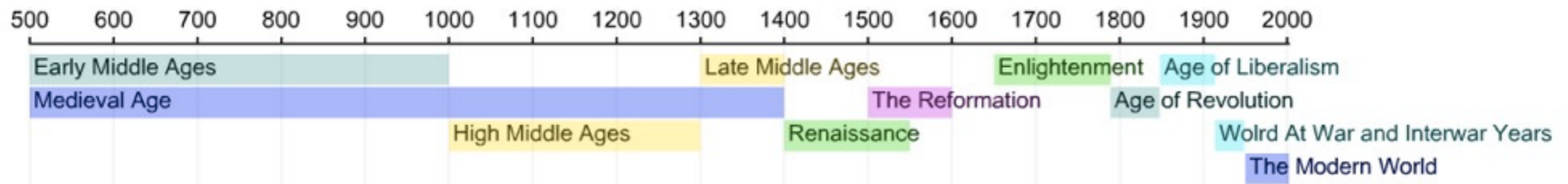
**Mahatma Gandhi**

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

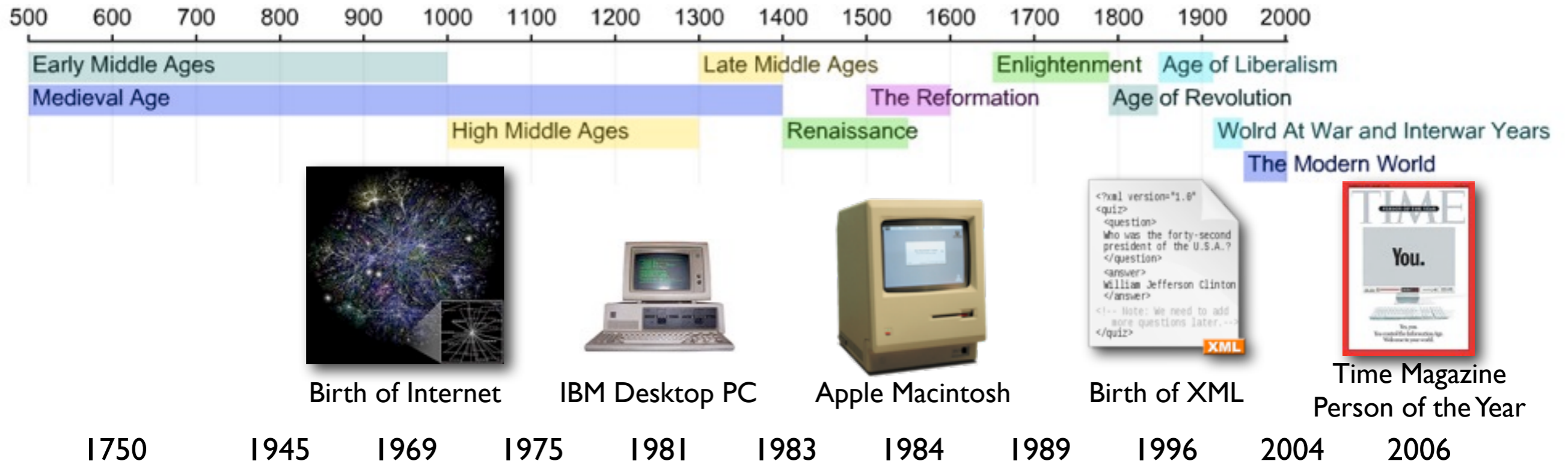
*Man is a social being.*



# A Brief History of the World



# A Brief History of the World



**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



**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. The following year, the company introduces the Apple II, the first for a personal computer, the Apple II featured color graphics.

**1978** - Intel introduces the 8086 microprocessor. Enabled the PC revolution and set industry standards that still exist today. The 8086 platform enabled hardware makers and software programmers to develop programs and add-on accessories. IBM then, most PCs had been closed and proprietary.

**1980** - Lotus Development Corporation introduces Lotus 1-2-3, which becomes a best-seller application.

**1981** - 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.

**1982** - Lisa Development Corporation introduces the Lisa 1-2-3, which becomes a best-seller application.

**1983** - Apple introduces the Macintosh with a GUI. A GUI is a graphical user interface that provides visual representation for what was previously lines of 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.

**1986** - The number of PCs shipped worldwide reaches nearly 100 million.

**1987** - In Geneva, Switzerland, Tim Berners-Lee develops a new technique for distributing information on the Internet, eventually called the World Wide Web.

**1988** - 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.

**1989** - Marc Andreessen creates an Internet browser called Mosaic.

**1990** - PC gaming comes of age when CD Software® introduces Doom, one of the most popular PC games ever. Doom also introduced multiplayer gaming to the masses, allowing players to compete in intense 1-on-1 or head-to-head, modem competitions.

**1991** - The number of PCs shipped worldwide reaches nearly 200 million.

**1992** - The number of PCs shipped worldwide reaches 200 million.

**1993** - Creative Labs introduces a Multimedia Upgrade Kit containing a CD-ROM drive, Sound Blaster™ Pro card, speakers and multimedia software.

**1994** - 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.

**1995** - The Digital Versatile Disc (DVD) debuts at the Consumer Electronics Show. Fujitsu introduces the technology into the IBM Thinkpower series, powered by the Pentium® processor.

**1996** - Intel introduces the Pentium® II processor and the number of PCs shipped worldwide reaches more than 400 million.

**1997** - Intel introduces the Pentium® III processor and the number of PCs shipped worldwide reaches more than 400 million.

**1998** - Intel introduces the Pentium® 4 processor and the number of PCs shipped worldwide reaches 500 million.

**1999** - The number of PCs shipped worldwide reaches 500 million.

**2000** - Intel introduces the Pentium® 4 processor and the number of PCs shipped worldwide reaches 500 million.

**2001** - IBM celebrates its 50th anniversary. 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.

**2002** - Intel introduces the Pentium® 4 Processor M, bringing laptop performance to the laptop PC.

**2003** - The PC industry ships the 1 billionth PC, according to industry analyst firm Gartner Dataquest.

**2004** - Intel introduces the Pentium® D processor. Approximately 40 million people are connected to the Internet and more than 1 billion dollars change hands online.

**2005** - Intel introduces the Pentium® D processor. Approximately 40 million people are connected to the Internet and more than 1 billion dollars change hands online.

**2006** - Intel introduces the Pentium® D processor. Approximately 40 million people are connected to the Internet and more than 1 billion dollars change hands online.

**2007** - Intel introduces the Pentium® D processor. Approximately 40 million people are connected to the Internet and more than 1 billion dollars change hands online.

**2008** - The number of PCs shipped worldwide may reach 2 billion, according to industry analyst firm Gartner Dataquest.

For more information, please visit <http://www.intel.com>



# Billionaires' Shuffle

2007



Facebook in 2004.02

**2008**

at **23** and \$ **1.5** billion later...



2008



# Facebook's Global Audience

Global Audience: 283,443,180

Data for 09/25/2009

About CheckFacebook.com

Total Users % Online Population

Zoom Out



Percent Online Users  
0 100

Not Pictured: Hong Kong, Maldives, Palestine, Singapore, Taiwan

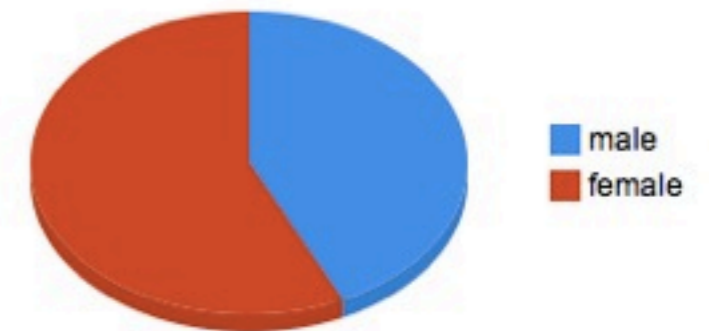
## United States

Country Audience: 86,406,460

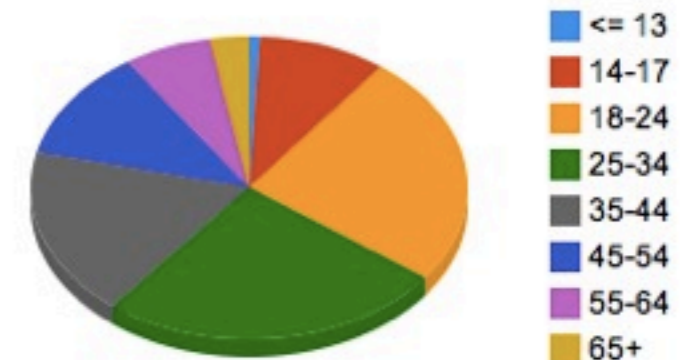
Percent of Global Audience: 30.48%

Share This Site 982 retweet

United States Male / Female



United States Age Distribution



Not Pictured: Hong Kong, Maldives, Palestine, Singapore, Taiwan

Percent Online Users  
0 100





# Facebook's Growth Table

## General Growth

More than 300 million active users

50% of our active users log on to Facebook in any given day

The fastest growing demographic is those 35 years old and older

## 10 Largest Countries

1. United States	86,406,460
2. United Kingdom	20,214,180
3. Turkey	13,104,960
4. Canada	12,862,140
5. France	12,245,140
6. Italy	11,573,640
7. Indonesia	9,642,620
8. Australia	6,572,900
9. Spain	6,554,500
10. Argentina	6,380,080

## 10 Fastest Growing Over Past Week

1. China	100.58 %	6,920
2. Taiwan	11.14 %	322,900
3. Vietnam	8.91 %	74,460
4. Philippines	6.77 %	360,360
5. Iraq	6.05 %	4,800
6. Romania	5.17 %	15,300
7. Sweden	5.11 %	127,760
8. Ireland	5.1 %	47,220
9. Ukraine	4.81 %	7,780
10. Qatar	4.49 %	8,500



# Global Internet Traffic

Alexa as of May 2009	China	USA	Japan	India	Brazil	Global
1	Baidu	Google	Yahoo.jp	Google.in	Google	Google
2	<b>QQ</b>	Yahoo	<b>FC2</b>	Google	<b>Orkut.br</b>	Yahoo
3	Sina	<b>Facebook</b>	Google.jp	Yahoo	Windows Live	<b>YouTube</b>
4	Google.cn	<b>YouTube</b>	<b>YouTube</b>	<b>Orkut.in</b>	Universo Online	<b>Facebook</b>
5	Taobao	<b>Myspace</b>	Rakuten	<b>YouTube</b>	<b>YouTube</b>	Windows Live
6	163	MSN	Livedoor	<b>Blogger</b>	Globo	MSN
7	Google	Windows Live	<b>Ameblo.jp</b>	Rediff	MSN	<b>Wikipedia</b>
8	Sohu	<b>Wikipedia</b>	<b>mixi</b>	<b>Facebook</b>	Google	<b>Blogger</b>
9	Youku	Craigslist	<b>Wikipedia</b>	<b>Wikipedia</b>	Yahoo	Baidu
10	Yahoo	EBay	Google	Windows Live	Terra	<b>Myspace</b>




# Twitter in Spotlight

HOME PAGE TODAY'S PAPER VIDEO MOST POPULAR TIMES TOPICS

**The New York Times**  
Friday, June 19, 2009

**News**

Search All NYTimes.com   

WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH SPORTS OPINION ARTS STYLE TRAVEL JOBS REAL ESTATE AUTOS


**The Lede**

[The New York Times News Blog](#)

June 2, 2009, 7:05 PM

## China's Great Firewall Blocks Twitter

By ROBERT MACKEY



Catherine Henriette/Agence France-Presse — Getty Images

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Next Post: [Punditry From Bin Laden and Zawahiri on Obama's Trip to the Middle East](#)

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June 18 (38 comments) [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



# 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**



The Era of Social Computing, Irwin King, The Future Generation Information Technology (FGIT2009), December 11, 2009, Jeju Island, Korea

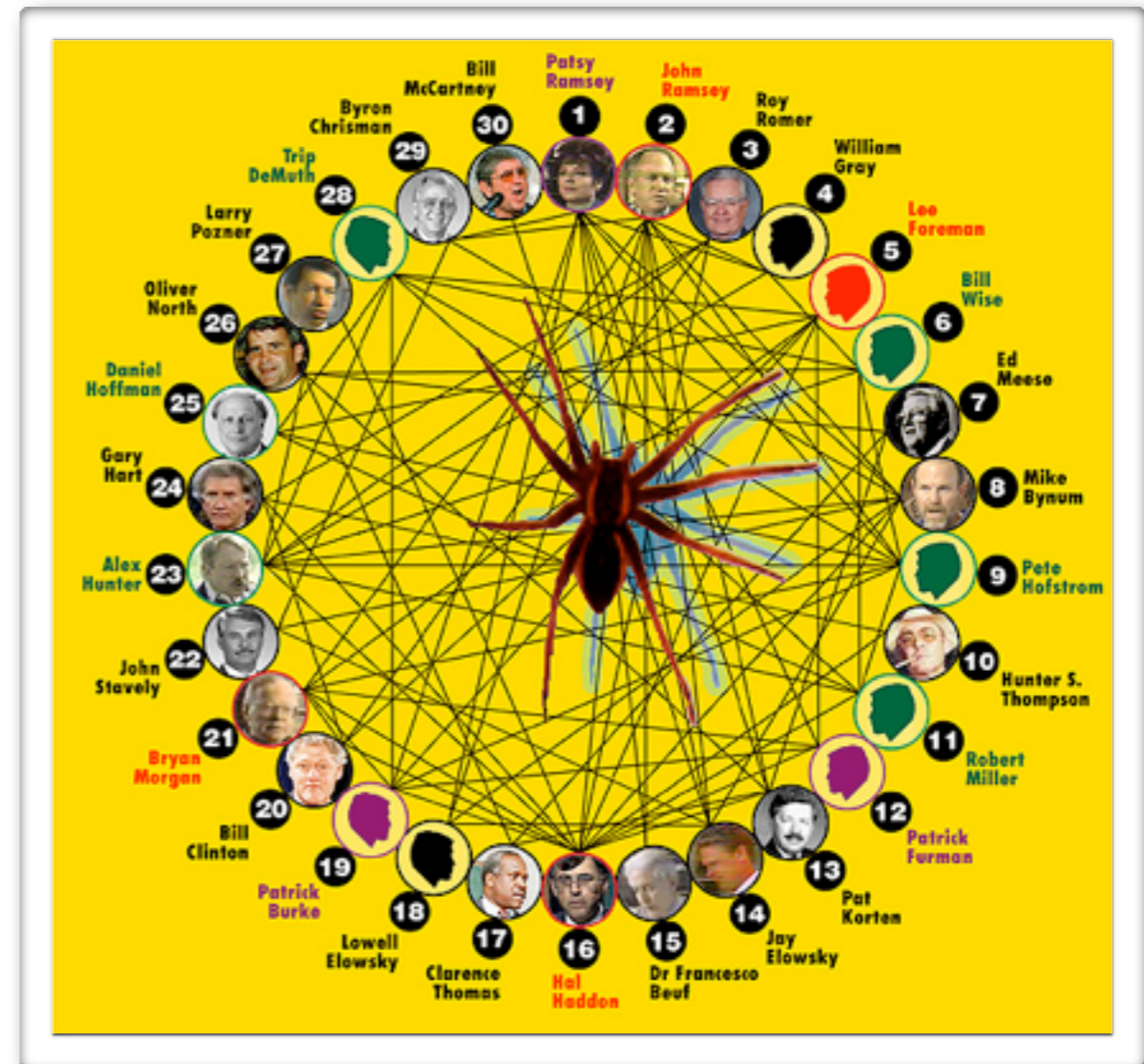


# Social Networks

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.

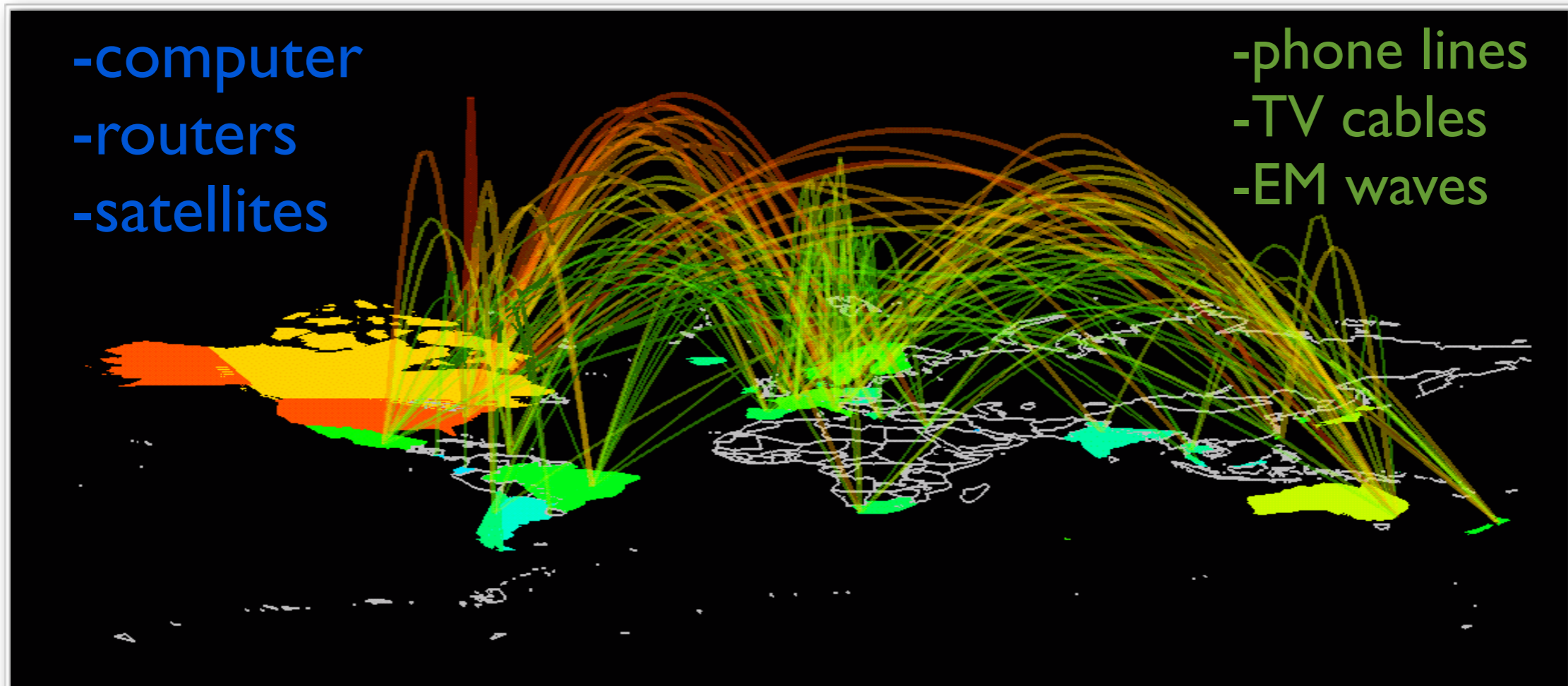


# Milgram's Experiment



# Social Networks

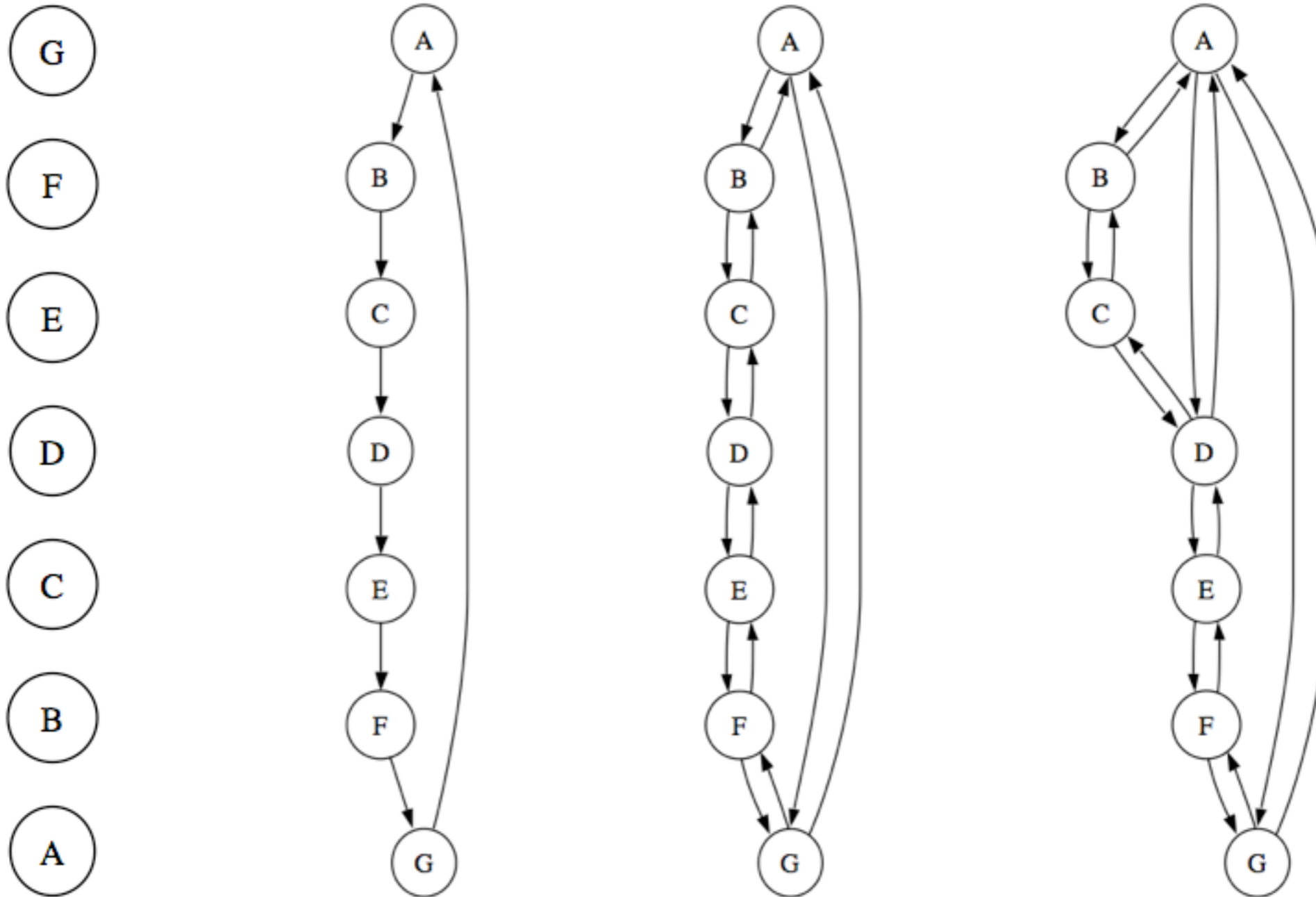
- The Earth is developing an electronic nervous system, a network with diverse **nodes** and **links**.



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

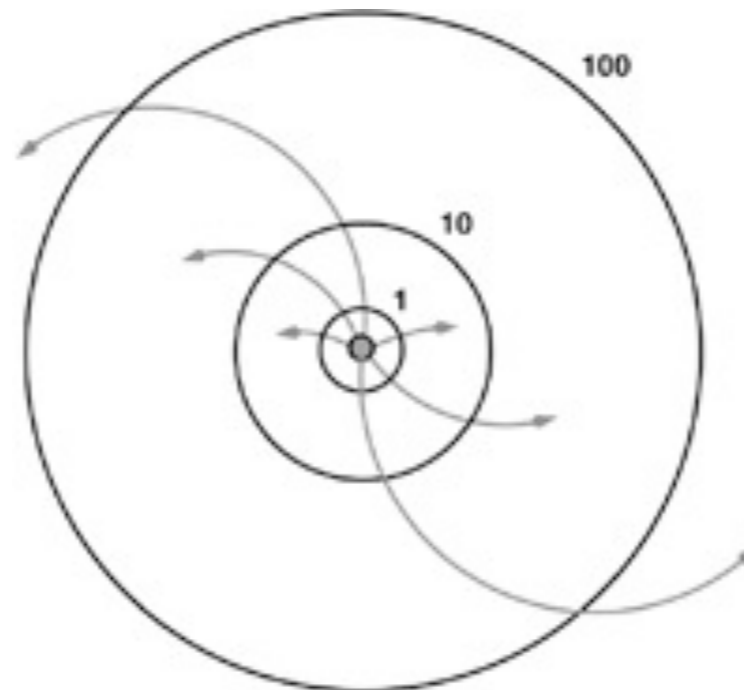
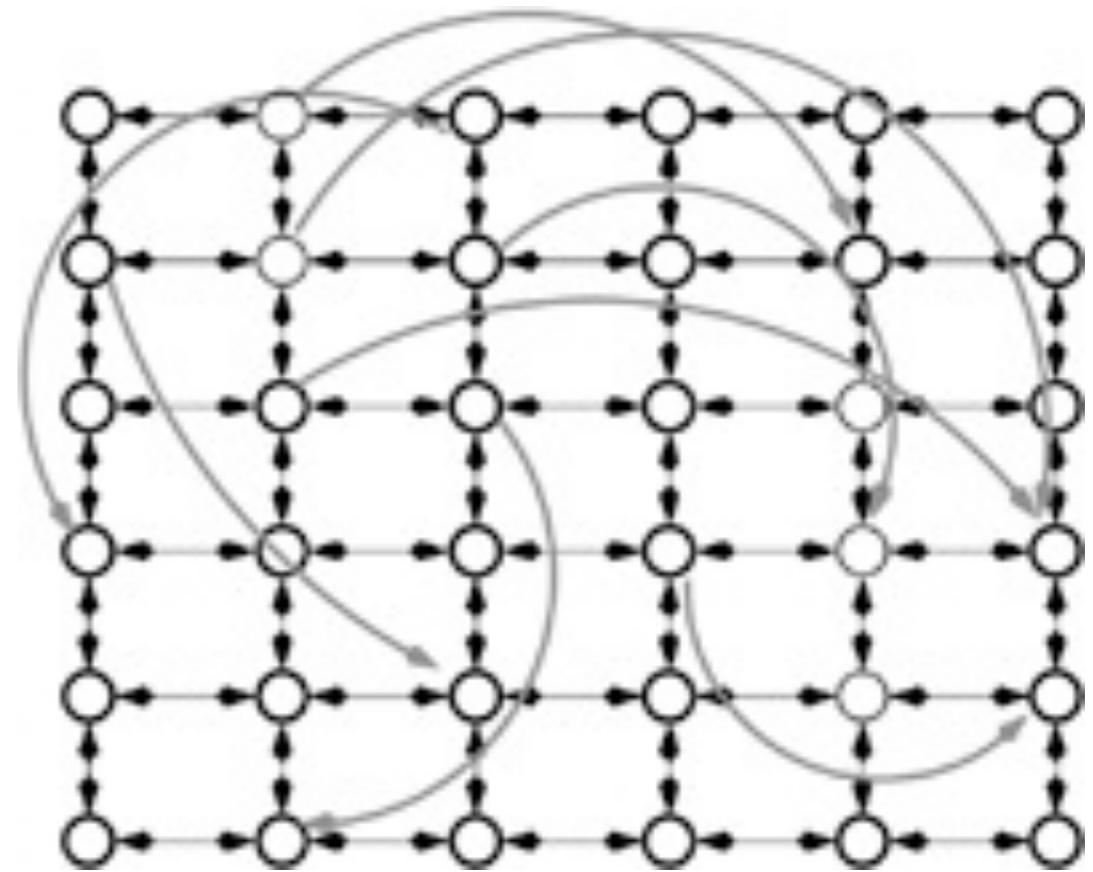
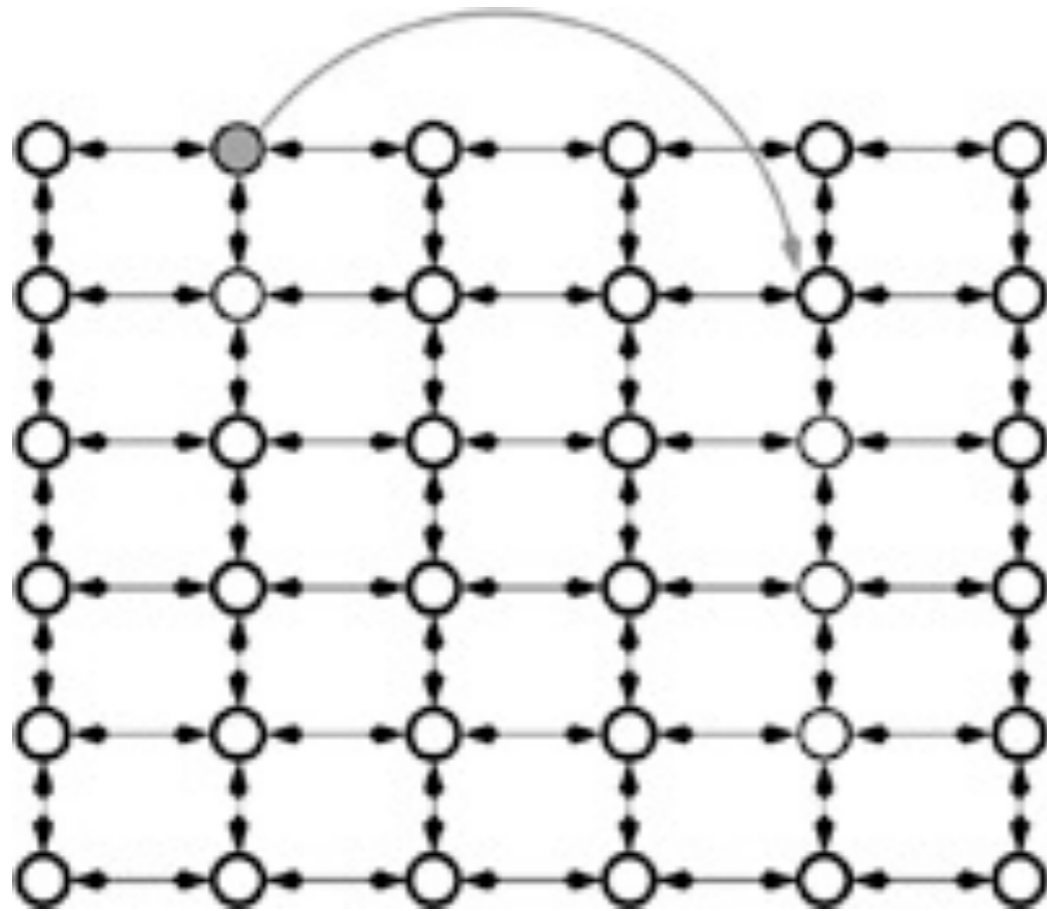


# The Flow of Information





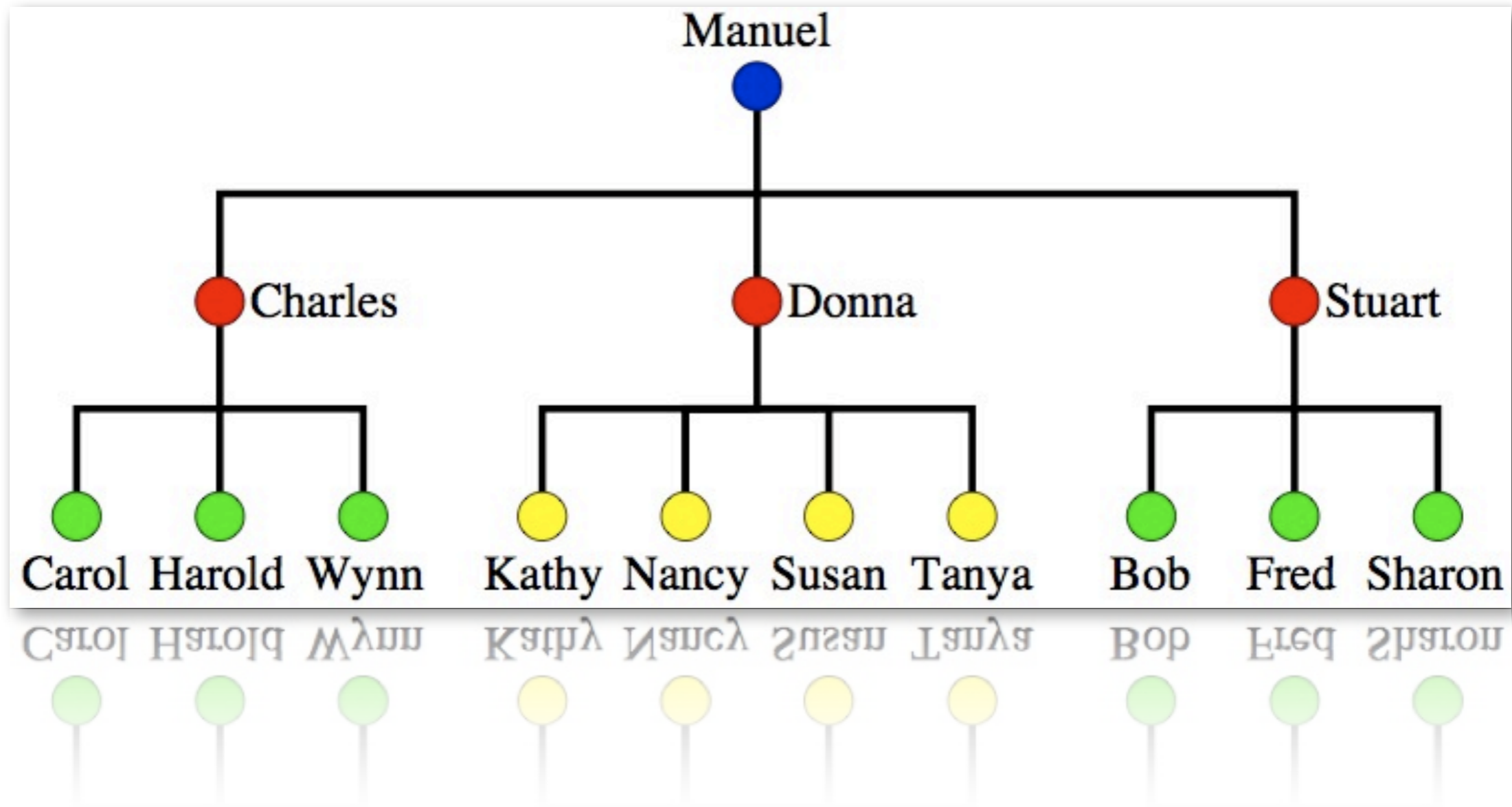
# Examples



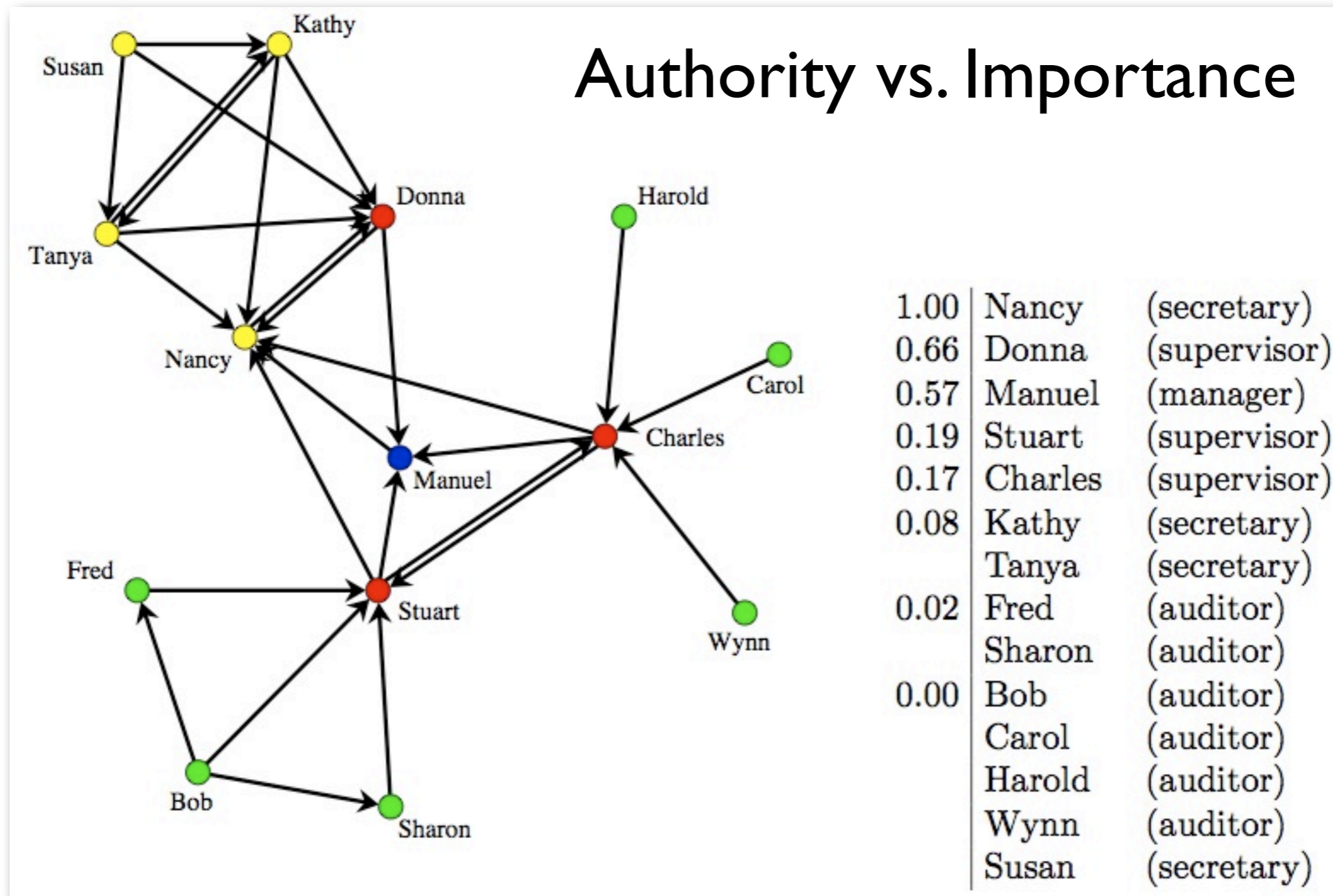
[Kleinberg 1999]



# Organizational Chart



# Social Network Chart



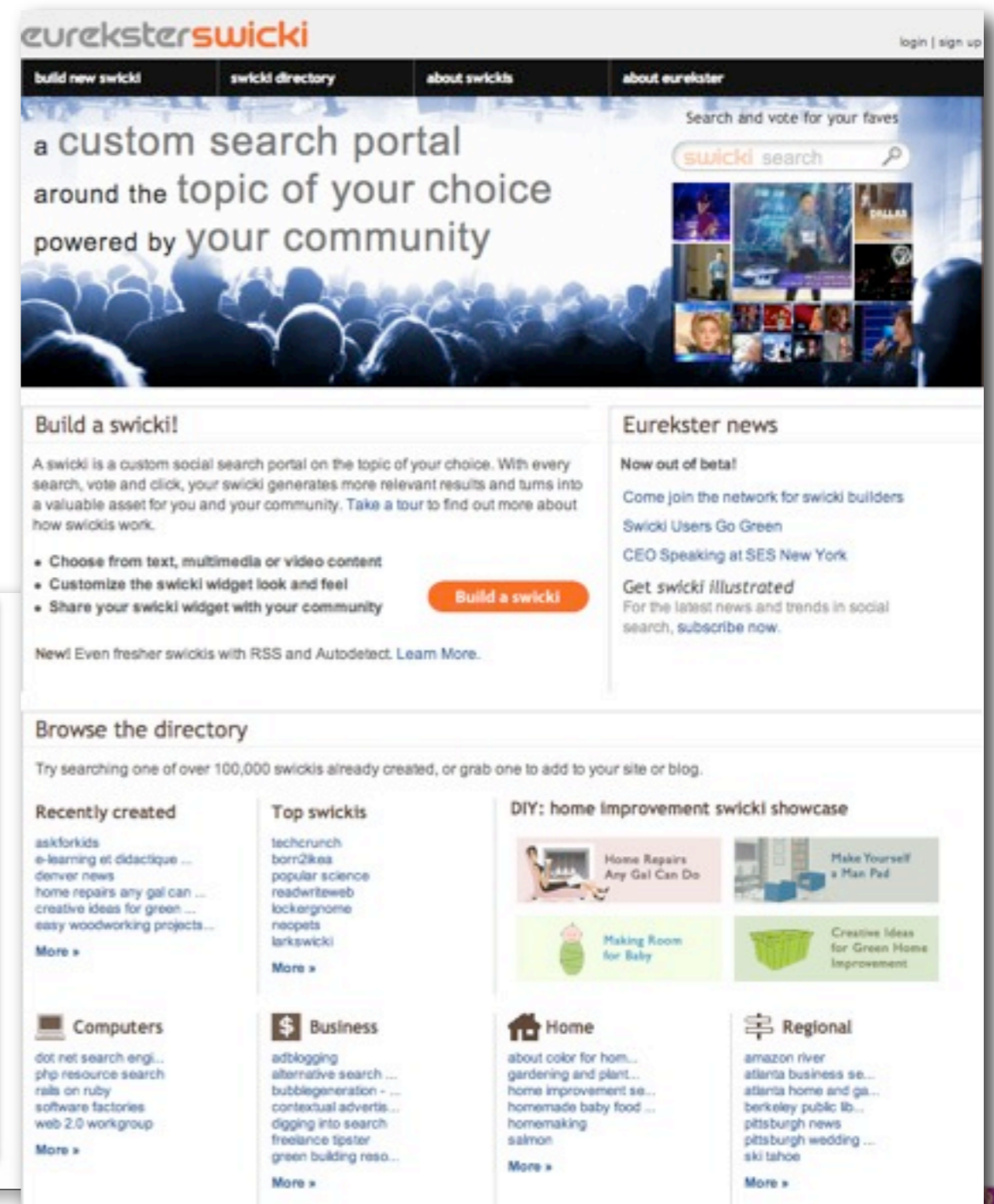
# Social Networking Sites

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



# Social Search

- Social Search Engine
- Leveraging your social networks for searching



# Social Media

The screenshot shows the YouTube homepage with the following elements:

- Header:** YouTube logo with the tagline "Broadcast Yourself™". Navigation tabs for Home, Videos, Channels, and Community. A search bar and an "Upload" button.
- Videos being watched right now...:** A row of five video thumbnails with their respective durations (02:13, 03:29, 01:58, 07:01, 03:53).
- Promoted Videos:** Four video thumbnails with titles like "Think Again Awards" and "第14屆十大電視廣告頒獎典禮 - 飛出...".
- Featured Videos:** A list of featured videos with thumbnails, titles, and view counts. Examples include "David Sedaris delivers a pizza" (11,313 views), "Erbert and Gerbert's Candle Cannon" (109,029 views), "Girl's Night Out" (169,435 views), and "Lionel Neykov - Freeze My Senses" (150,758 views).
- What's New:** A yellow box containing updates for "YouTube Mobile", "Warp!" (a fullscreen player), "RSS Feeds", and "SXSW on YouTube".
- Login:** A login form with fields for Username and Password, and a "Login" button. Links for "Sign Up | Help" and "Login with your Google account" are also present.

The screenshot shows the Flickr homepage with the following elements:

- Header:** Flickr logo and a "Sign In" link.
- Main Content:** A large banner image of a small plant growing from a crack in the pavement. Text reads "Share your photos. Watch the world." with a "SEARCH" button.
- Statistics:** "3,802 photos uploaded in the last minute · 558,832 photos tagged with urban · 2.2 million photos uploaded this month · Take the tour".
- Navigation:** Four icons representing "Share & stay in touch", "Upload & organize", "Make stuff!", and "Explore...".
- Footer:** A "Take the Tour" button and a link to "Explore Flickr Blog, the World Map, Camera Finder or interesting photos from the last 7 days".

The screenshot shows the iLike homepage with the following elements:

- Header:** iLike logo and the text "In partnership with MySpace Music". A search bar for "Enter an artist or song name here".
- Sign Up/Log In:** "Sign Up" and "Log In" buttons. Text says "Artists: Sign up to manage your profile".
- Do you love music?:** A section promoting personalized concert alerts from favorite artists in iTunes.
- Popular artists on iLike this week:** A row of artist thumbnails including "Empire Of The Sun", "James King", "Marina V", and "Jamie Cullum".
- Mobile Apps by iLike:** A section for "Local Concerts" with a guitar icon and text "Find nearby shows. Coming soon. Personalized to your music collection.".
- iLike player:** A section with a search bar "Enter an artist name..." and a "Play" button. Below it, a list of "Recent activity on iLike" and "Recent song picks by iLike users" is visible.



# Social News/Mash Up

The screenshot shows the Digg website interface. At the top, there's a navigation bar with 'Join Digg', 'About', and 'Login'. Below that, there are tabs for 'All', 'News', 'Videos', 'Images', 'Podcasts', and 'Customize'. A secondary navigation bar lists categories like 'Technology', 'World & Business', 'Science', 'Gaming', 'Lifestyle', 'Entertainment', 'Sports', and 'Offbeat'. The main content area is titled 'News, Videos, Images' and features a list of articles. The first article is 'Microsoft Demos "ADD TO DIGG" Feature in IE8' with 104 votes. Other articles include 'It was only a matter of time, The SIMS 3 Official' (161 votes), 'Universe submerged in a sea of chilled neutrinos' (151 votes), 'Unique locks on microchips could reduce hardware piracy' (180 votes), and 'Warren Buffett Passes Gates To Become World's Richest Man' (519 votes). On the right side, there's a 'Visual Studio' advertisement and a 'Top in All Topics' section with various trending items like 'The ravages of aging: Sean Connery, 20 years ago vs Today'.

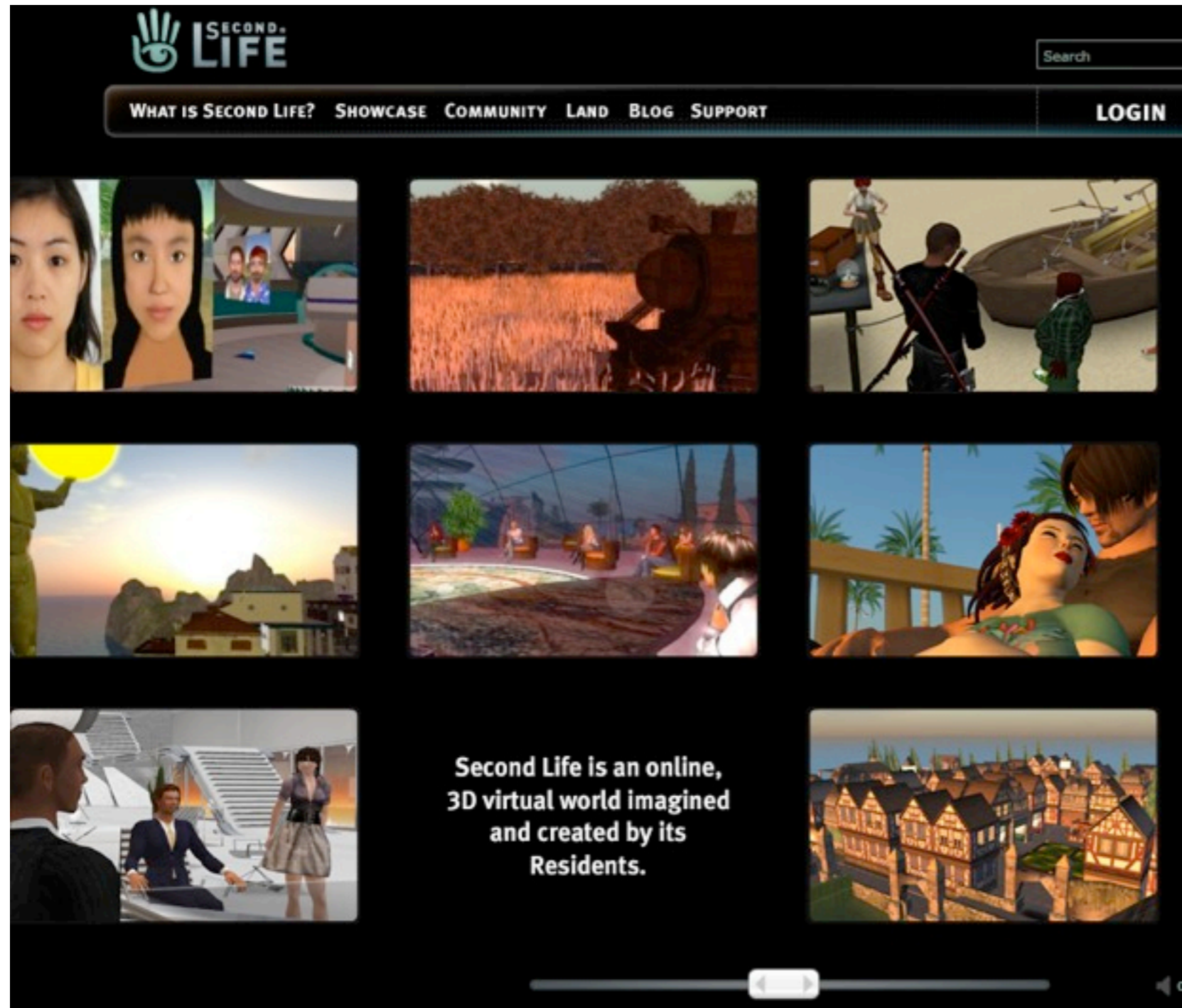
The screenshot shows the Twitter website homepage. At the top, there's a 'Select Language' dropdown. The main heading is 'What is Twitter?' with sub-sections for 'What?', 'Why?', and 'How?'. Below this is a large graphic of a yellow bird on a branch. To the right, there's a 'Watch a video!' button and a sign-in form with fields for 'user name or email address' and 'password', along with a 'Remember me' checkbox and a 'Sign in' button. Below the sign-in form, there's a link for 'Forgot password? Click here.' and a green button for 'Already using Twitter from your phone? Click here.' The main content area features a '8 new tweets' section and a 'twittervision' map overlay.

The screenshot shows the FoxyTunes website for the artist Björk. The top navigation bar includes 'sign up | faq | login' and 'feedback | send artist'. The search bar is set to 'artist or song name'. The main content area is titled 'Björk' and features a 'Videos on YouTube' section with 'All is full of love' (4:09) and 'Björk - Hunter' (3:38). There's also a 'Lyrics from Yahoo! Music' section with a list of songs like '5 Years', 'Alarm Call', and 'Bachelorette'. Below that, there's a 'Flickr Photos' section with 'Selected Photos' and a 'Music on Hype Machine' section with a 'Play All' button. The bottom of the page shows 'The Sugarcubes' and 'Goldfrapp' as related artists.

The screenshot shows a map overlay titled 'twittervision' showing the location of a tweet. The map is centered on the United States and includes labels for 'Chukchi Sea', 'Beaufort Sea', 'Baffin', 'Gulf of Alaska', and 'North Pacific Ocean'. A tweet bubble is overlaid on the map, showing a profile picture of a penguin and the text 'Killane I feel odd 17 minutes ago in North of Seattle'. The map also shows the 'United States' and 'North Pacific Ocean'.



# On-line Games and Virtual Communities





# Social Bookmarking

delicious social bookmarking

It's Free! Join Now Sign In

The tastiest bookmarks on the web.  
Save your own or see what's fresh now!

Search the biggest collection of bookmarks in the universe...

Fresh Bookmarks Popular Bookmarks Explore Tags

The freshest bookmarks that are flying like hotcakes on Delicious and beyond.

The Associated Press: Text of Obama's Nobel Peace Prize speech

BBC News - Barack Obama set for Oslo Nobel Peace Prize ceremony

BibSonomy :: search:all :: <fulltext search here>

A blue social bookmark and publication sharing system.

Home tags authors relations groups popular

BibSonomy is a system for sharing bookmarks and lists of literature. When discovering a bookmark or a publication on the web, you can store it on our server. You can add tags to your post to retrieve it more easily. This is very similar to the bookmarks/favorites that you store within your browser. The advantage of BibSonomy is that you can access your data from wherever you are. Furthermore, you can discover more bookmarks and publications from your friends and other people.

This page shows you the latest updates of BibSonomy. Why dont you just try it yourself? After a free registration, you can organise your own bookmarks and publications, and discover related entries.

bookmarks publications

Twitter Guide Book – How To, Tips and Instructions by Mashable

The probability of topological concordance of gene trees and species trees

Genealogy of neutral genes in two partially isolated populations

filter: busy tags

design internet java

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citeulike is a free service for managing and discovering scholarly references

3,367,975 articles - 5,043 added today.

- Easily store references you find online
- Discover new articles and resources
- Automated article recommendations<sup>NEW</sup>
- Share references with your peers
- Find out who's reading what you're reading
- Store and search your PDFs

Join now



# Social Entertainment

The screenshot shows the Swoopo website header with the logo, navigation links (Home, My Swoopo, Help, Register), and a login form. Below the header is a large banner for kitchenware. The banner features a kitchen scene with a stand mixer, knives, and vegetables. Text on the banner includes 'Starting NOW', 'CALPHALON, HENCKELS & KITCHENAID', and 'REGISTER NOW FOR FREE'. A 'Browse Kitchenware' link is also present.

The screenshot displays five active auctions on the Swoopo website. Each auction card includes the item name, a timer, the current bid amount, and a 'BID' button. The auctions are:

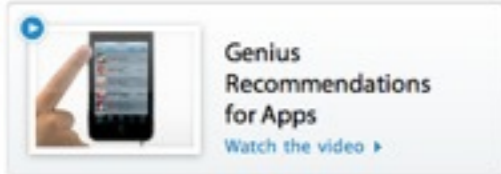
Item	Timer	Current Bid	User
300 Bids Voucher	00:00:18	\$117.90	Nirajzala
MySims Agents (Nintendo DS)	00:02:05	\$0.24	Bb4kids
Samsung UN46B6000 46-Inch 1080p LED HDTV	00:00:15	\$102.00	Julia30
Wii   Nintendo Console + Wii Sports	00:00:15	\$32.04	Bearboy66
Apple MacBook Pro MB991LL/A 13.3-Inch Laptop	00:45:27	\$12.42	Jamesham



# 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.



# Social Informatics

## Social Informatics

Contact : [Slovenian](#) : [FDV](#)



### Search

[Advanced search](#)

### Login

[New user](#) [Lost password](#)

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### Introduction

- [Concept](#)
- [History](#)

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](#)>>

### 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](#)

### 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](#)



# Social Knowledge Sharing

**WIKIPEDIA**

- English**  
The Free Encyclopedia  
2 268 000+ articles
- Deutsch**  
Die freie Enzyklopädie  
718 000+ Artikel
- Français**  
L'encyclopédie libre  
631 000+ articles
- 日本語**  
フリー百科事典  
474 000+ 記事
- Nederlands**  
De vrije encyclopedie  
414 000+ artikelen
- Español**  
La enciclopedia libre  
339 000+ artículos
- Svenska**  
Den fria encyklopedin  
277 000+ artiklar
- Polski**  
Wolna encyklopedia  
477 000+ hasel
- Italiano**  
L'enciclopedia libera  
421 000+ voci
- Português**  
A enciclopédia livre  
364 000+ artigos

search · suche · rechercher · szukaj · 検索 · ricerca · zoeken · busca  
buscar · sök · поиск · 搜索 · søk · haku · suk · cerca · căutare · ara

**KNOL™**  
BETA

Welcome to Knol

## Share what you know

Write and post a knol (nōl) — a unit of knowledge.

**Create**  
easy to write and manage

**Search**  
searchable through popular search engines

**Control**  
each knol is owned by you, the author

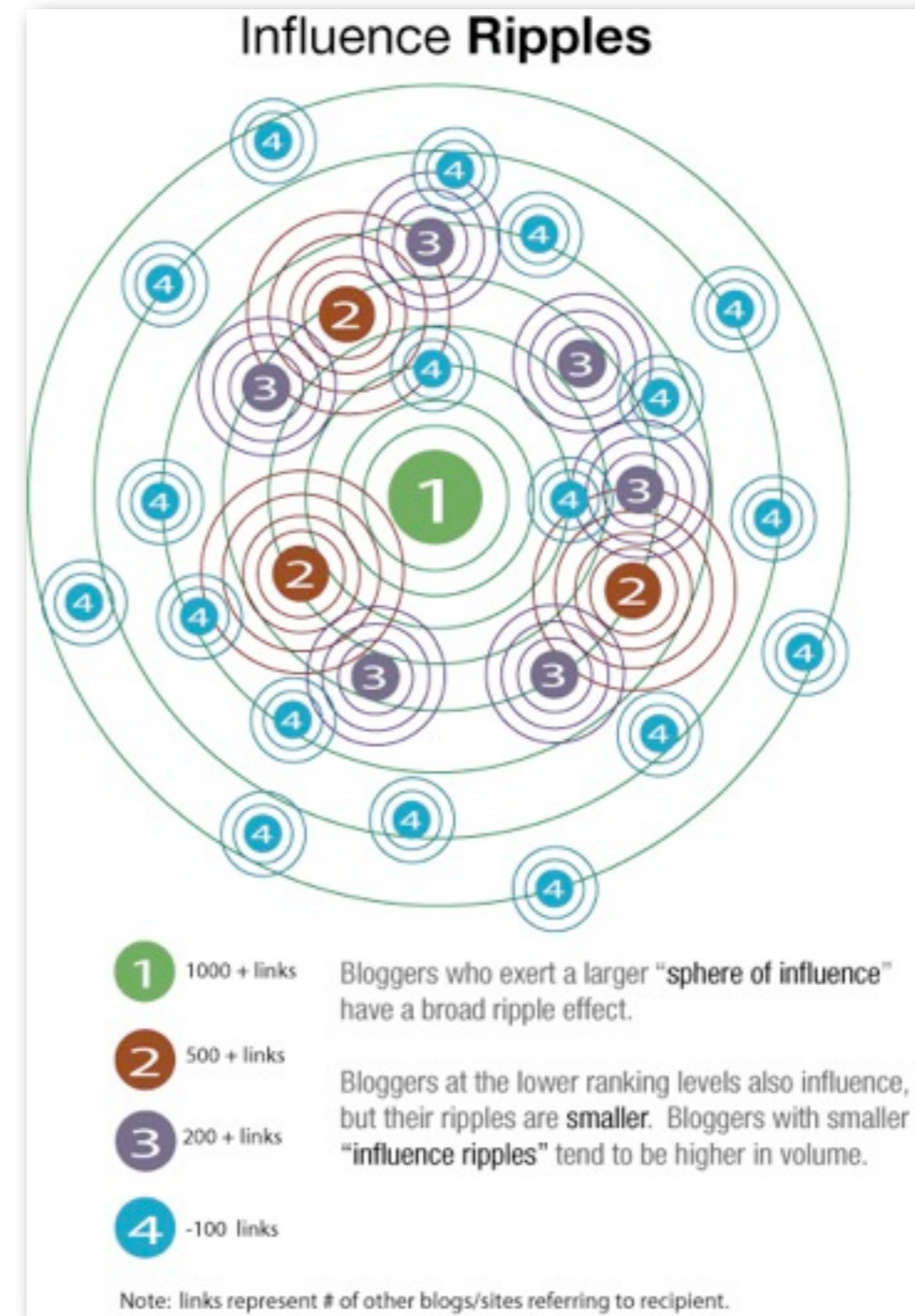
Search bar with a dropdown menu showing "English" and a search button.

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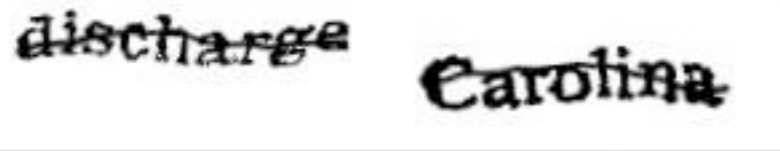
# Social Marketing

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



# Social/Human Computation

Security Check: Enter both words below, separated by a space. What's This?  
Can't read this? Try another.  
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Text in the box:

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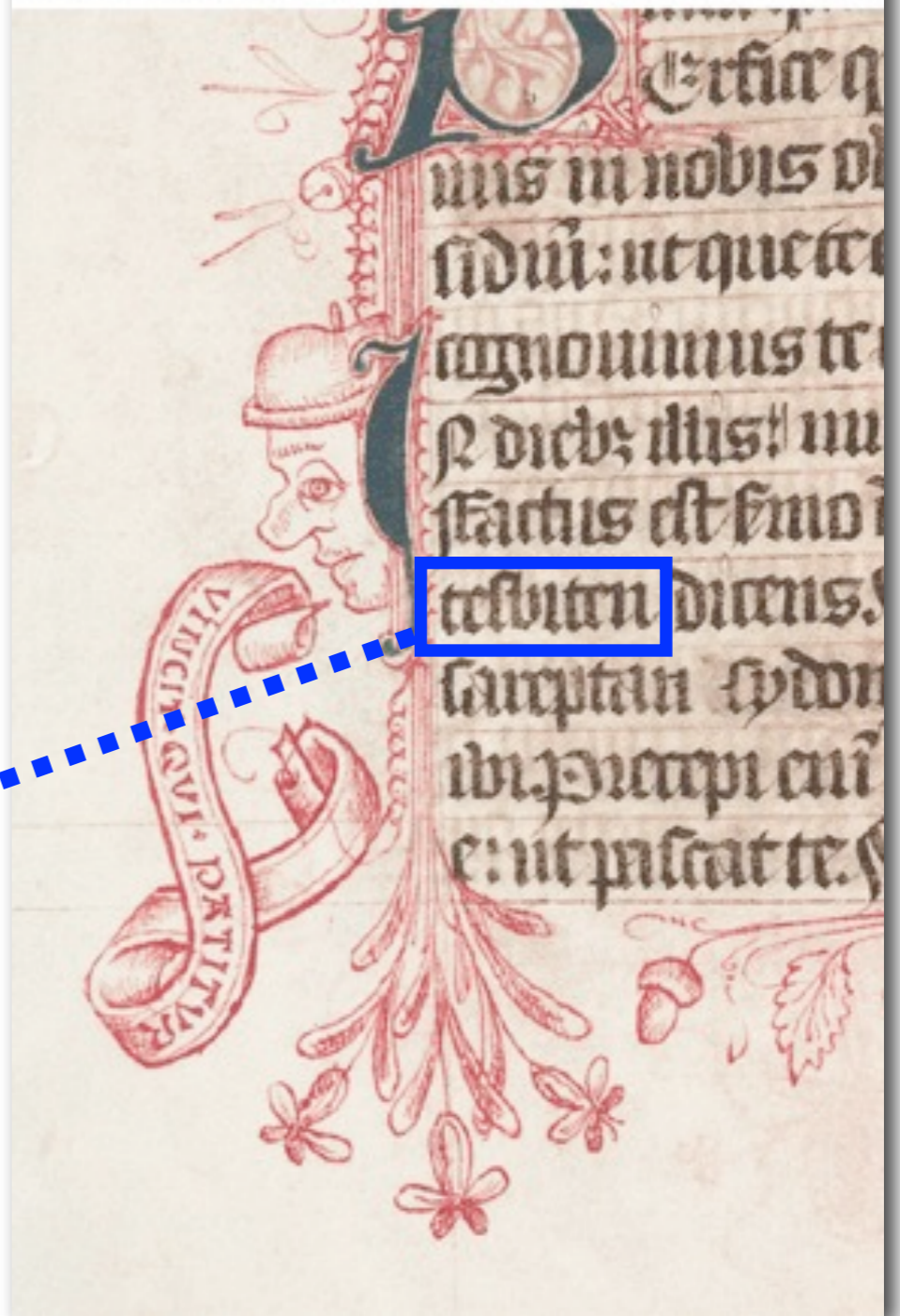
Text in the box:

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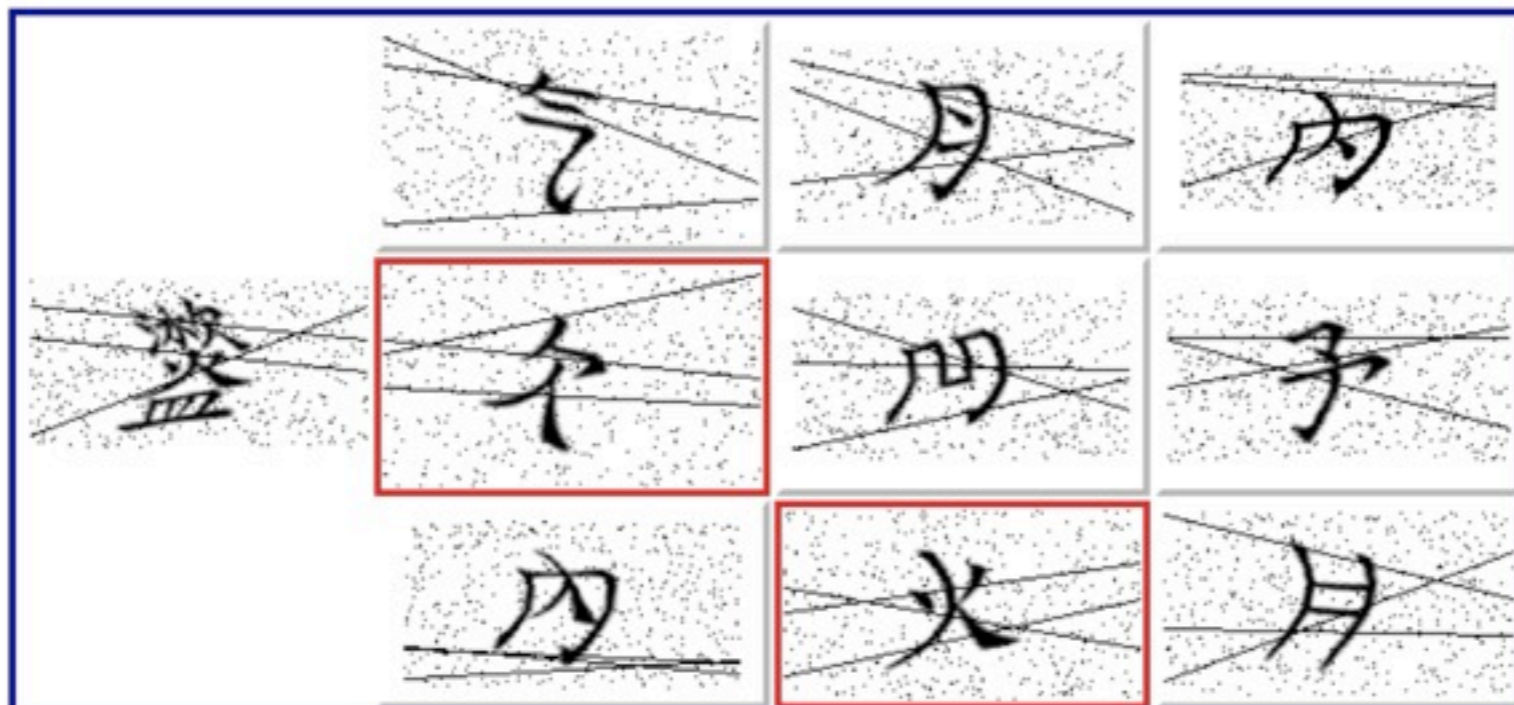
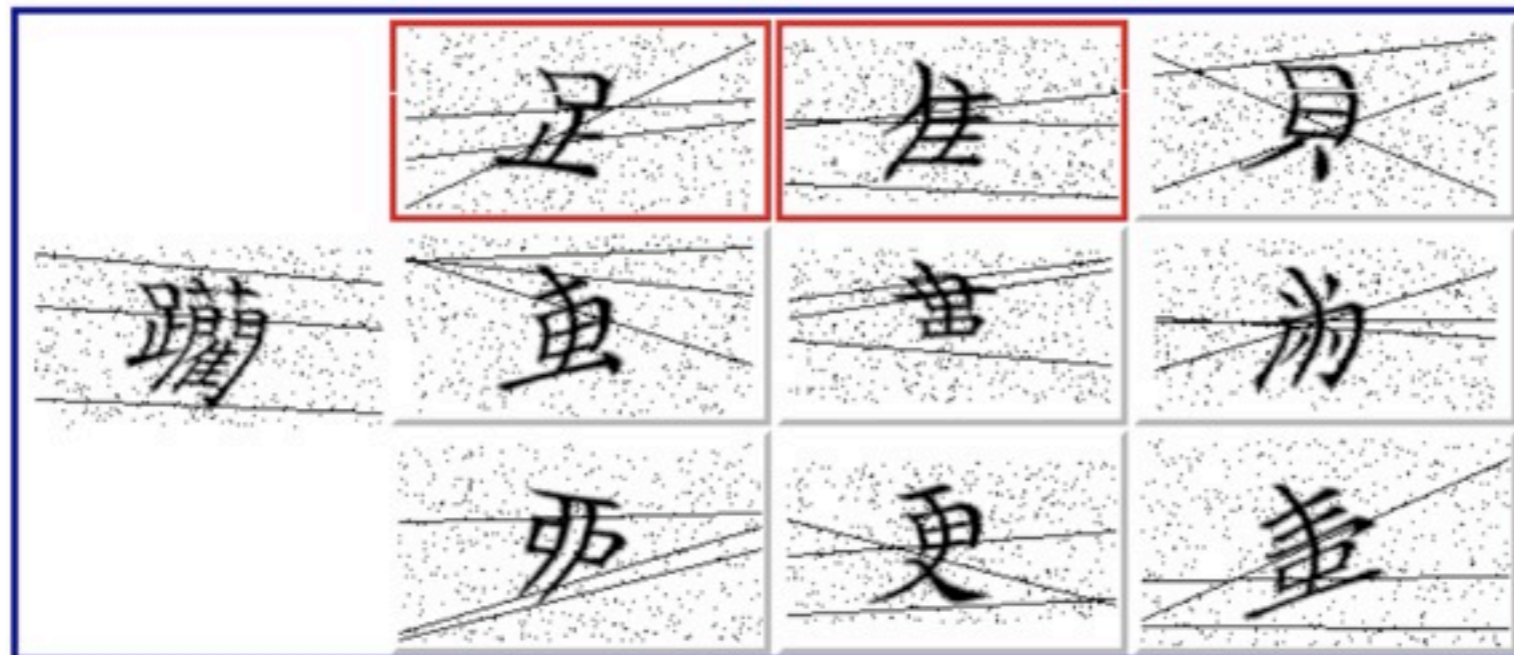
[Problems signing up? Check out our help pages](#)

MS. Don. b. 6, fol. 48v (detail) © Bodleian Library, University of Oxford



# Chinese CAPTCHA

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





# Human Computation

The screenshot shows the Google Image Labeler interface. At the top left is the Google logo and 'Image Labeler BETA'. The main title is 'Google Image Labeler'. On the left, there is a sidebar with 'time left' (01:17), 'score' (0), and 'passes' (0). The main area contains a search bar, a 'label' button, and a 'pass' button. Below the search bar, it says 'Your partner has suggested 10 labels.' A central image of a lake and mountains is shown with a 'zoom out' button below it. On the right, there are two sections: 'off-limits' with labels 'sky', 'water', 'blue', 'lake', and 'mountain', and 'my labels' which is currently empty. Red starburst shapes are overlaid on the interface, highlighting the search bar, the 'label' button, the 'off-limits' list, and the 'my labels' section.

Google Image Labeler BETA

Help | Sign In

time left  
01:17

score  
0

passes  
0

label pass

Your partner has suggested 10 labels.

sky  
water  
blue  
lake  
mountain

my labels

zoom out

[Privacy Policy](#) - [Terms of Use](#) - [Return to Google Image Search](#)  
© 2007 Google



# Games With A Purpose



- **Matchin**
  - Image search by aesthetic value
- **Babble**
  - Translate foreign language into English
- **InTune**
  - Tags songs with description text
- **Squigl**
  - Image segmentation
- **Verbosity**
  - Database of common knowledge description



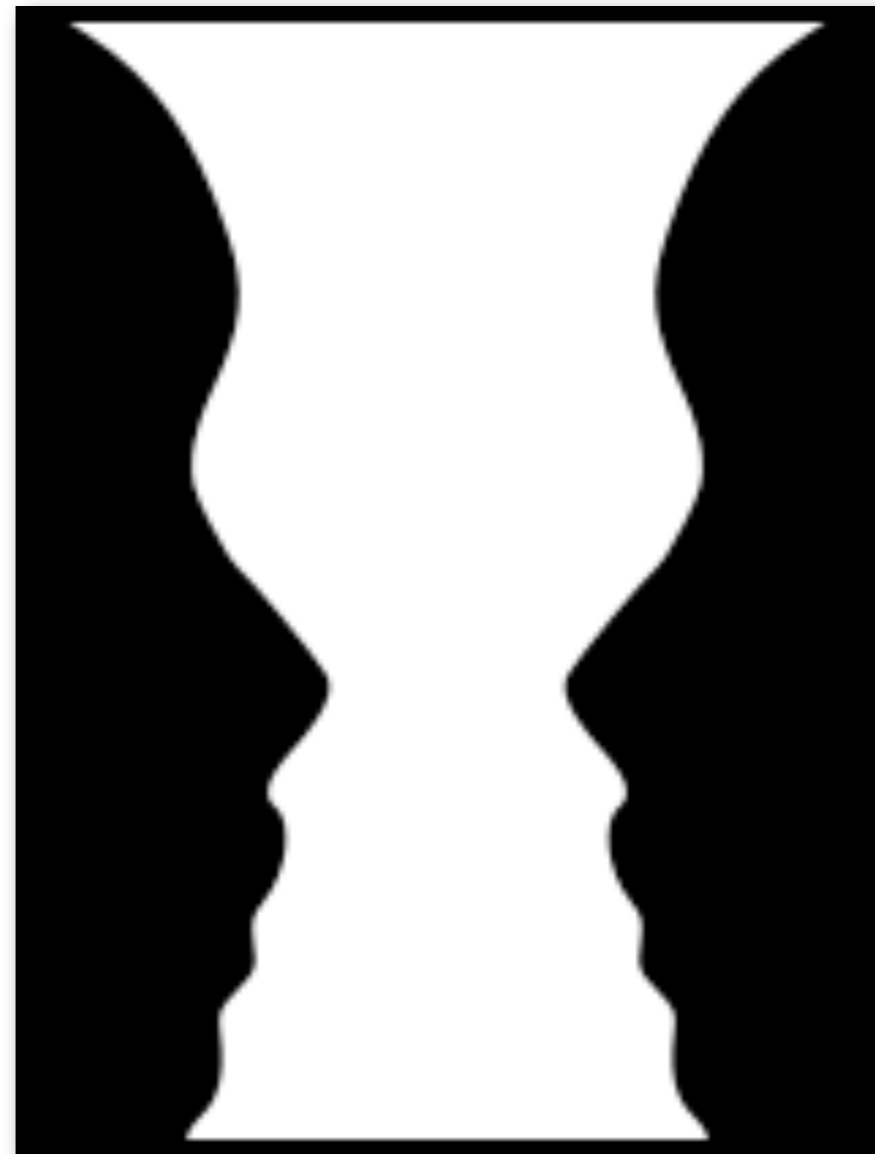
# Web 2.0 Revolution

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

**C**onnectivity

**C**ollaboration

**C**ommunities



# Social Relations

presence  
identity  
social role  
reputation  
expertise  
trust  
ownership  
accountability  
knowledge  
crew  
teams  
populations  
squad  
organizations  
cohorts  
markets  
communities  
partners  
groups  
binary  
cardinal  
integer  
real

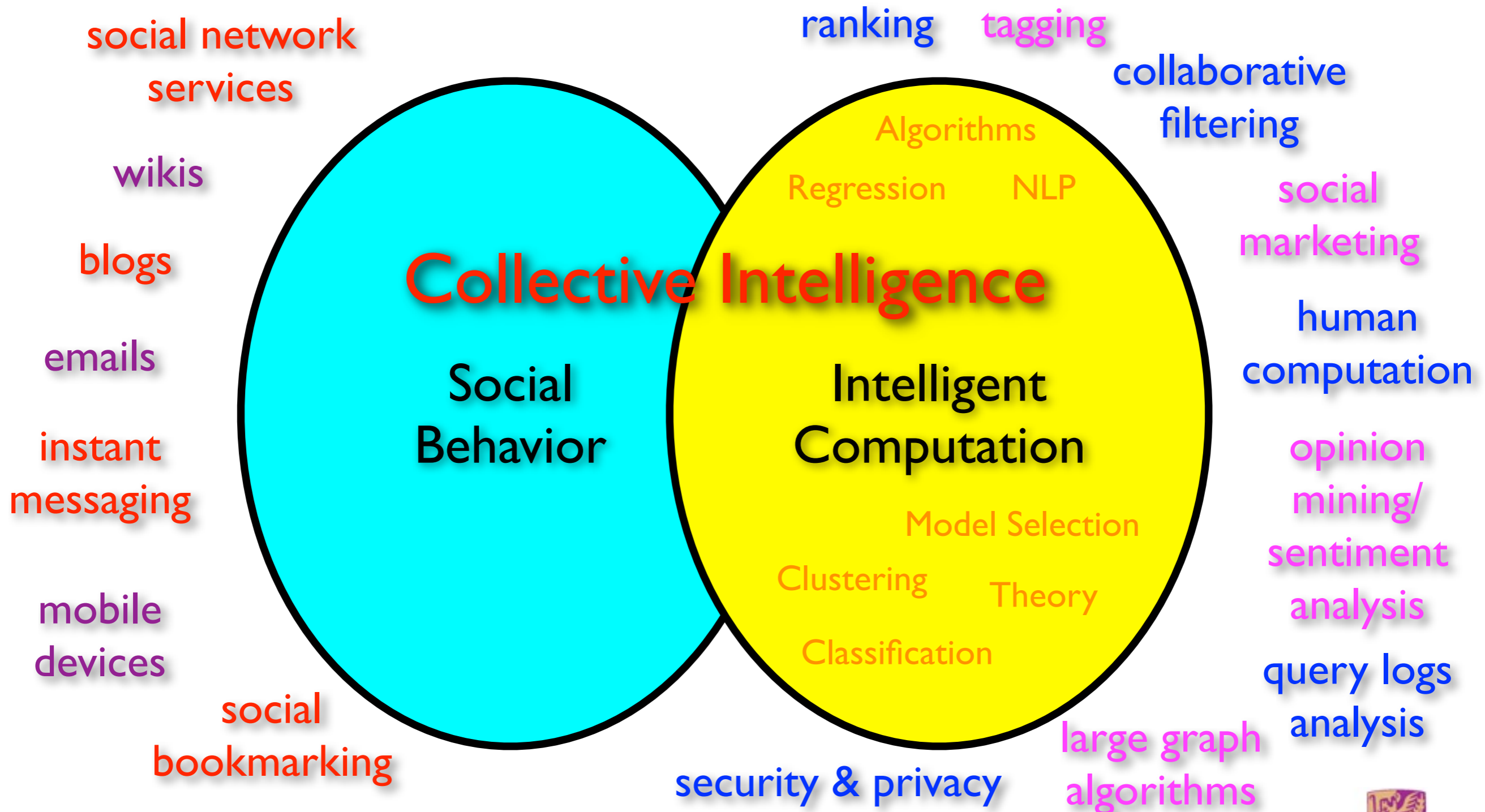


# Topics in Social Computing

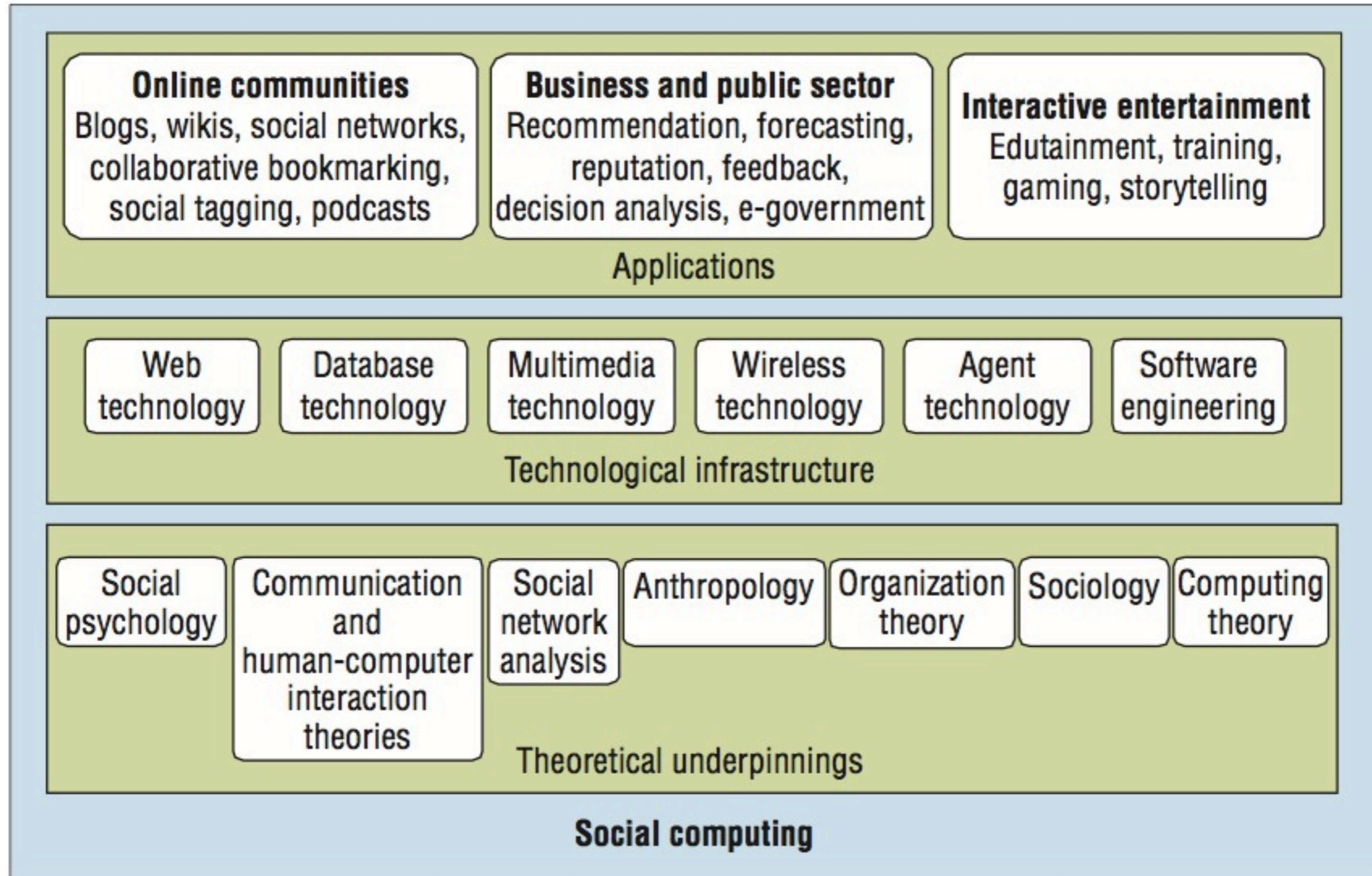
- Social Behavior Analysis and Modeling
- Social Media
- Social Network Theory and Models
- Link Analysis/Graph Mining/  
Large Graph Algorithms
- Recommender Systems/  
Collaborative Filtering
- QA/Sentiment Analysis/  
Opinion Mining
- Human Computation/  
Crowdsourcing
- Risk, Trust, Security, and  
Privacy
- Monetization of Social  
Computing
- Software Tools and  
Applications
- and many, many more...



# Social Computing



# Social Computing



[Wang et al. 2007]



# Definition of Social Computing [wiki]

- Any Computer-mediated communication and interaction
- In the weaker sense: **supporting any sort of social behavior**
  - blogs, email, instant messaging, wiki, social network services, social bookmarking
- In the stronger sense: **supporting “computations” that are carried out by a group of people**
  - collaborative filtering, online auctions, prediction markets, reputation systems, tagging, verification games





# Motivation

The image shows a screenshot of a Google search for "cat cancer". The search bar contains "cat cancer" and the search button is visible. The search results show "Results 1 - 10 of about 17,900,000 for **cat cancer**. (0.22 seconds)". The first result is "Warning Signs Of Cancer In Cats: Knowledge of Common Cancer ..." with a snippet: "Cancer is a leading cause of death in older cats. Knowing the warning signs of cancer may help in finding it earlier, when treatment has a better chance of ...". The second result is "Cancer (oncology) of Cats - General Information" with a snippet: "From the About.com Cats Guide: a list of re... Pets A nice overview of diagnosis and treatr...". The third result is "Feline Cancer Resources" with a snippet: "This is a Web site for the cats and their loving ones who are fighting, or have fought, various forms of cancer." A red arrow points from the search bar to a callout box containing two points:

1. Difficult for users to express information needed
2. Word mismatch in information retrieval



# Motivation

cat cancer - Google Search

http://www.google.com.hk/search?hl=en&q=c

Apple Yahoo! Google Maps YouTube Wikipedia News (1691) Popular

cat cancer - Google Search

When you learn your **cat** has **cancer** there are often feelings of bewilderment and even guilt. ('how could I have prevented this?'), and it ...  
[www.aht.org.uk/pdf/feline\\_cancer2.pdf](http://www.aht.org.uk/pdf/feline_cancer2.pdf) - [Similar pages](#)

Searches related to: **cat cancer**

<a href="#">feline squamous cell cancer</a>	<a href="#">squamous cell carcinoma cats</a>	<a href="#">dogs and cats</a>	<a href="#">feline oral squamous cell carcinoma</a>
<a href="#">cat cancer symptoms</a>	<a href="#">cat lymph nodes</a>	<a href="#">radiation therapy cats</a>	<a href="#">lymphoma in cats</a>

Go

1 2 3 4 5 6 7 8

cat cancer Search

[Search within results](#) - [Language Tools](#) - [Search Help](#) - [Dissatisfied? Help us improve](#)

1. Accurate to express information needed  
2. Easy to inform information



# Challenges

- Queries contain **ambiguous** and **new** terms
  - **apple**: “apple computer” or “apple pie”?
  - **NDCG**:?
  - Users tend to submit **short queries** consisting of only one or two words
  - almost **20%** one-word queries
  - almost **30%** two-word queries
- Users may have **little or even no knowledge** about the topic they are searching for!



# Query Suggestion Using Clickthrough Data

- Query logs recorded by search engines

$$\langle u, q, l, r, t \rangle$$

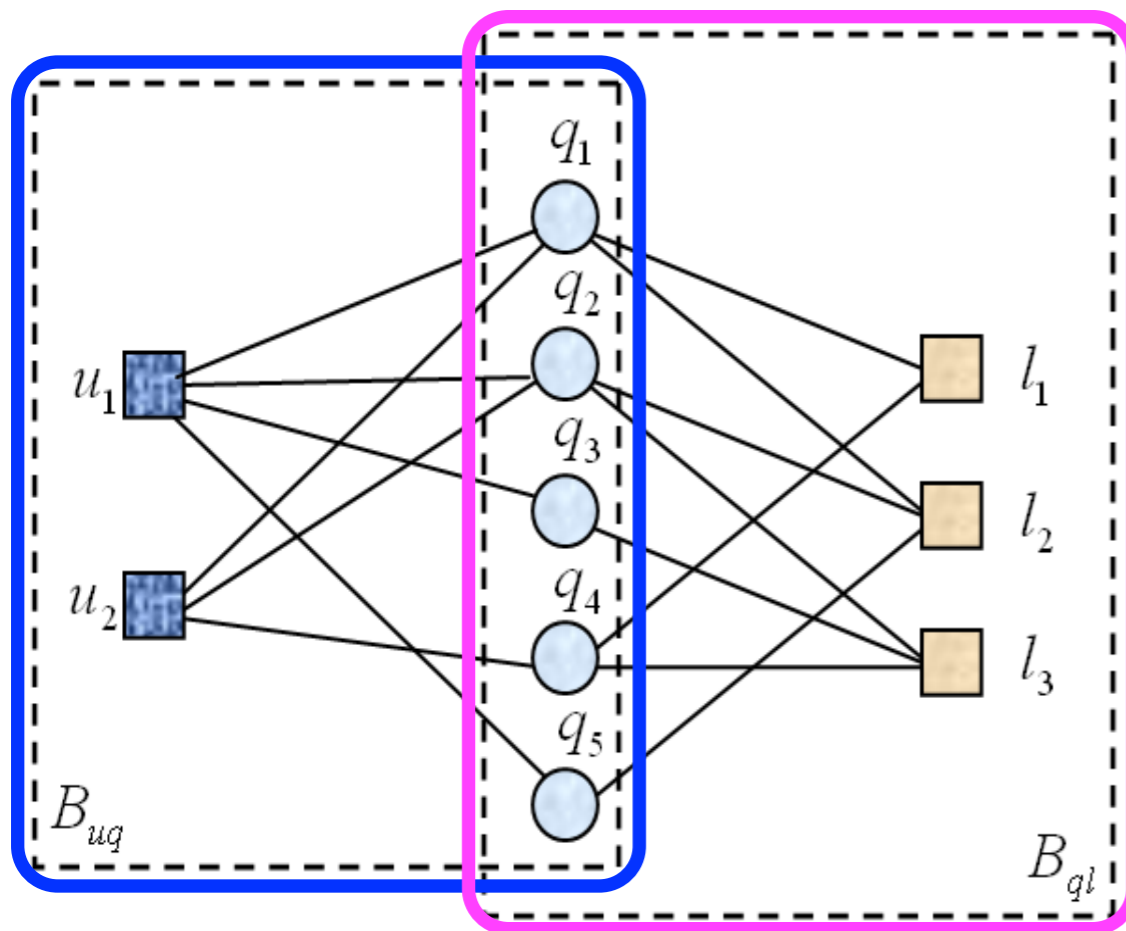
Table 1: Samples of search engine clickthrough data

ID	Query	URL	Rank	Time
358	facebook	<a href="http://www.facebook.com">http://www.facebook.com</a>	1	2008-01-01 07:17:12
358	facebook	<a href="http://en.wikipedia.org/wiki/Facebook">http://en.wikipedia.org/wiki/Facebook</a>	3	2008-01-01 07:19:18
3968	apple iphone	<a href="http://www.apple.com/iphone/">http://www.apple.com/iphone/</a>	1	2008-01-01 07:20:36
...	...	...	...	...

- Users' **relevance feedback** to indicate desired/preferred/target results



# Joint Bipartite Graph



$$B_{uq} = (V_{uq}, E_{uq})$$

$$V_{uq} = U \cup Q$$

$$U = \{u_1, u_2, \dots, u_m\}$$

$$Q = \{q_1, q_2, \dots, q_n\}$$

$E_{uq} = \{(u_i, q_j) \mid \text{there is an edge from } u_i \text{ to } q_j\}$   
is the set of all edges.

The edge  $(u_i, q_j)$  exists in this bipartite graph if and only if a user  $u_i$  issued a query  $q_j$ .

$$B_{ql} = (V_{ql}, E_{ql})$$

$$V_{ql} = Q \cup L$$

$$Q = \{q_1, q_2, \dots, q_n\}$$

$$L = \{l_1, l_2, \dots, l_p\}$$

$E_{ql} = \{(q_i, l_j) \mid \text{there is an edge from } q_i \text{ to } l_j\}$   
is the set of all edges.

The edge  $(q_j, l_k)$  exists if and only if a user  $u_i$  clicked a URL  $l_k$  after issuing an query  $q_j$ .



# Key Points

- Two-level latent semantic analysis

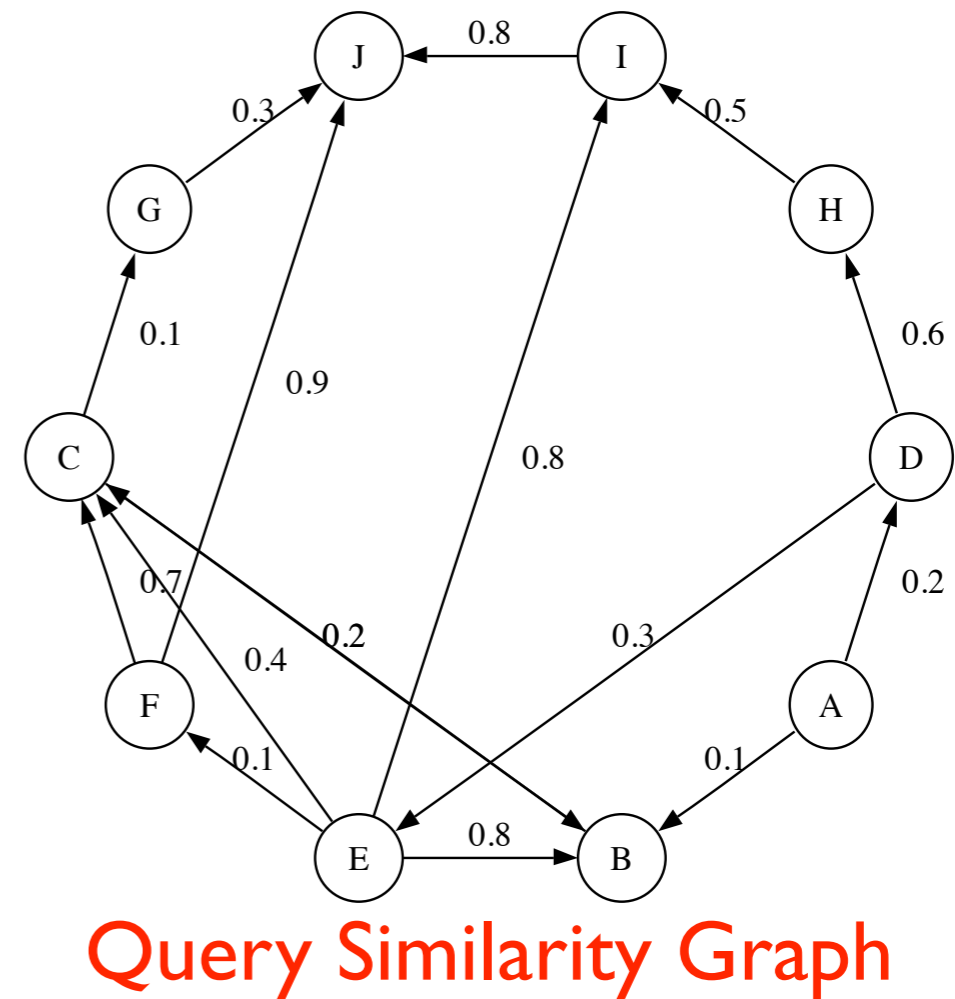
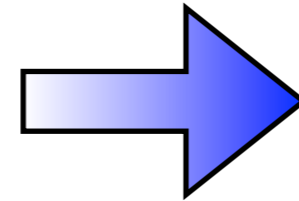
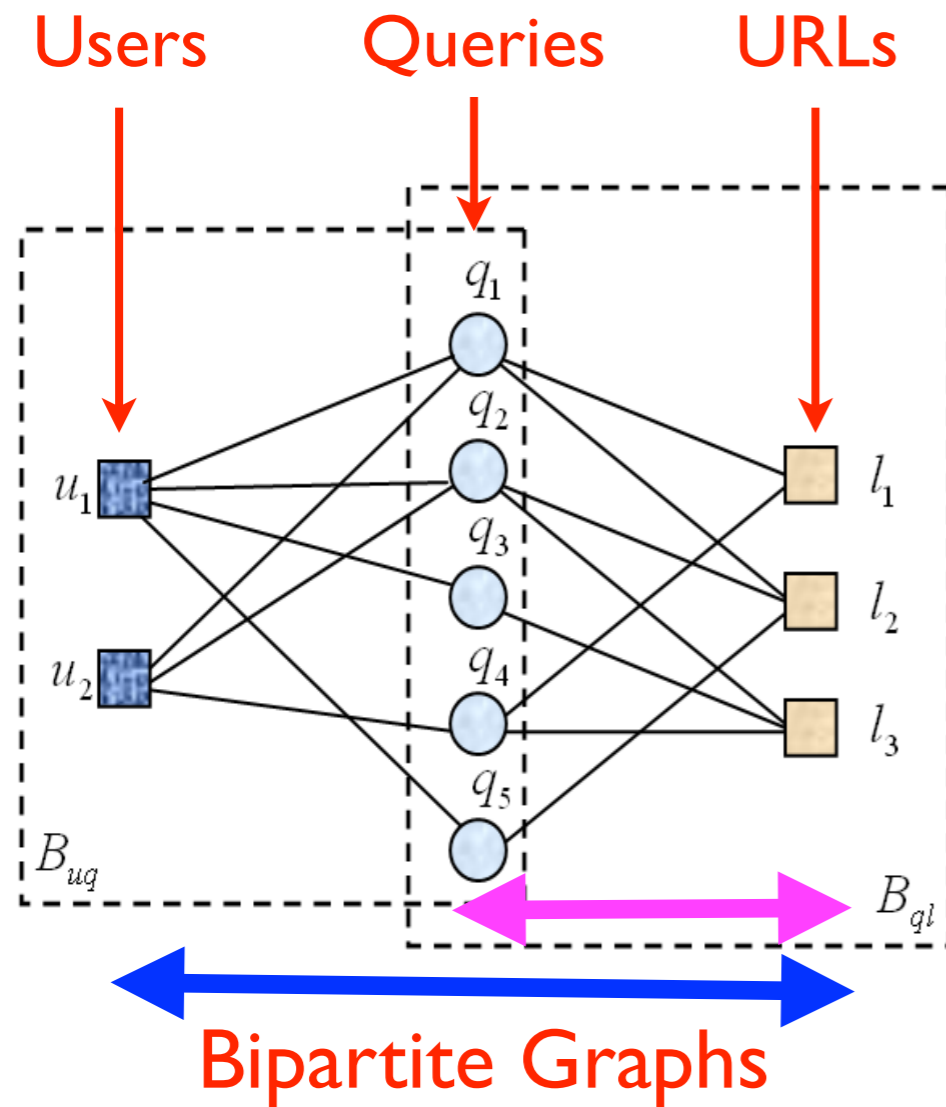
Level  
1  
Level  
2

- Consider the use of a joint **user-query** and **query-URL bipartite graphs** for query suggestion

- Use **matrix factorization** for learning query features in constructing the Query Similarity Graph

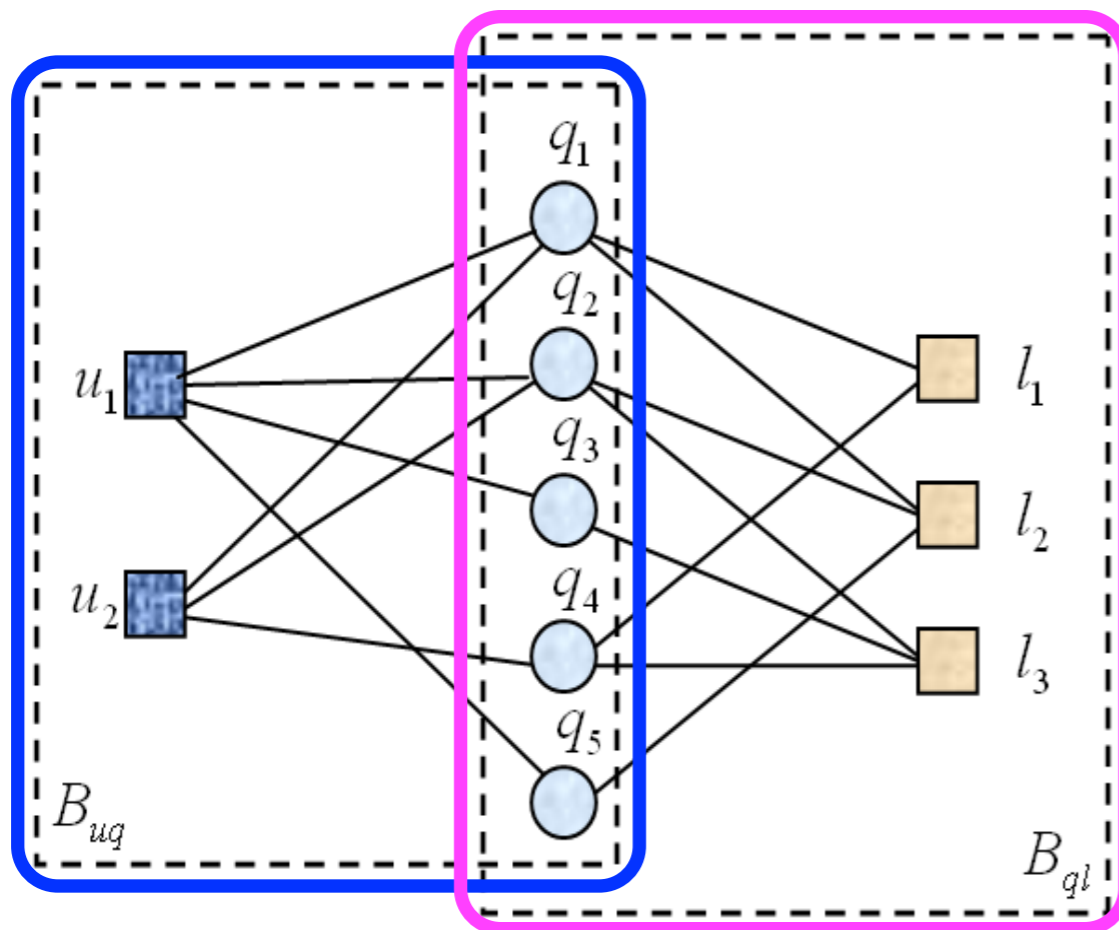
- Use **heat diffusion** for similarity propagation for query suggestions





- Queries are issued by the users, and which URLs to click are also decided by the users
- Two distinct users are similar if they issued **similar queries**
- Two queries are similar if they are issued by **similar users**





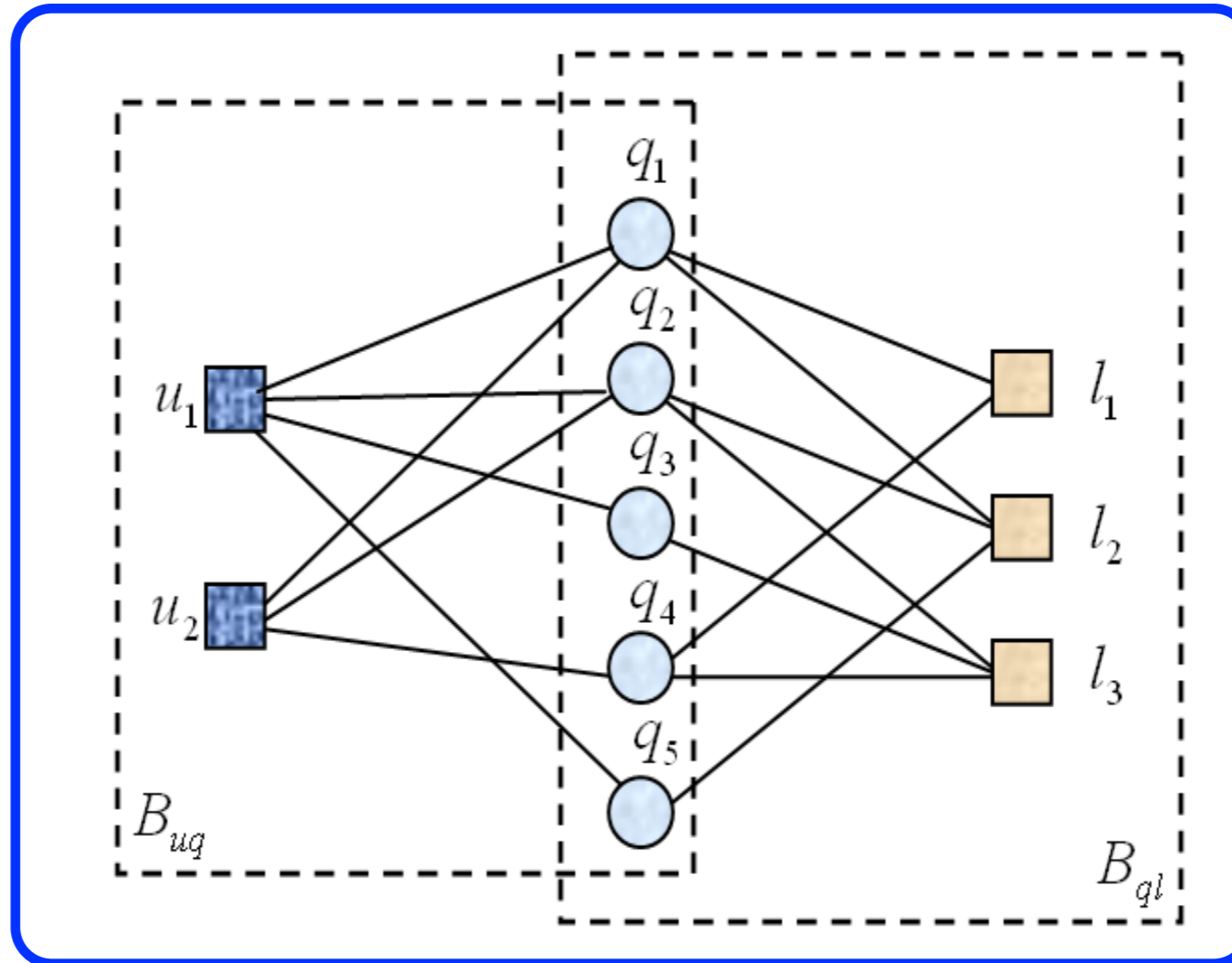
- $r_{ij}^*$  Normalized weight, how many times  $u_i$  issued  $q_j$
- $s_{jk}^*$  Normalized weight, how many times  $q_j$  is linked to  $l_k$
- $U_i$   $L$ -dimensional vector of user  $u_i$
- $Q_j$   $L$ -dimensional vector of query  $q_j$
- $L_k$   $L$ -dimensional vector of URL  $l_k$

$$\mathcal{H}(R, U, Q) = \min_{U, Q} \frac{1}{2} \sum_{i=1}^m \sum_{j=1}^n I_{ij}^R (r_{ij}^* - g(U_i^T Q_j))^2 + \frac{\alpha_u}{2} \|U\|_F^2 + \frac{\alpha_q}{2} \|Q\|_F^2$$

$$\mathcal{H}(S, Q, L) = \min_{Q, L} \frac{1}{2} \sum_{j=1}^n \sum_{k=1}^p I_{jk}^S (s_{jk}^* - g(Q_j^T L_k))^2 + \frac{\alpha_q}{2} \|Q\|_F^2 + \frac{\alpha_l}{2} \|L\|_F^2$$







$$\mathcal{H}(S, R, U, Q, L) =$$

$$\frac{1}{2} \sum_{j=1}^n \sum_{k=1}^p I_{jk}^S (s_{jk}^* - g(Q_j^T L_k))^2 + \frac{\alpha_r}{2} \sum_{i=1}^m \sum_{j=1}^n I_{ij}^R (r_{ij}^* - g(U_i^T Q_j))^2$$

$$+ \frac{\alpha_u}{2} \|U\|_F^2 + \frac{\alpha_q}{2} \|Q\|_F^2 + \frac{\alpha_l}{2} \|L\|_F^2,$$

- A local minimum can be found by performing **gradient descent** in  $U_i, Q_j$  and  $L_k$



# Gradient Descent Equations

$$\frac{\partial \mathcal{H}}{\partial U_i} = \alpha_r \sum_{j=1}^n I_{ij}^R g'(U_i^T Q_j) (g(U_i^T Q_j) - r_{ij}^*) Q_j + \alpha_u U_i,$$

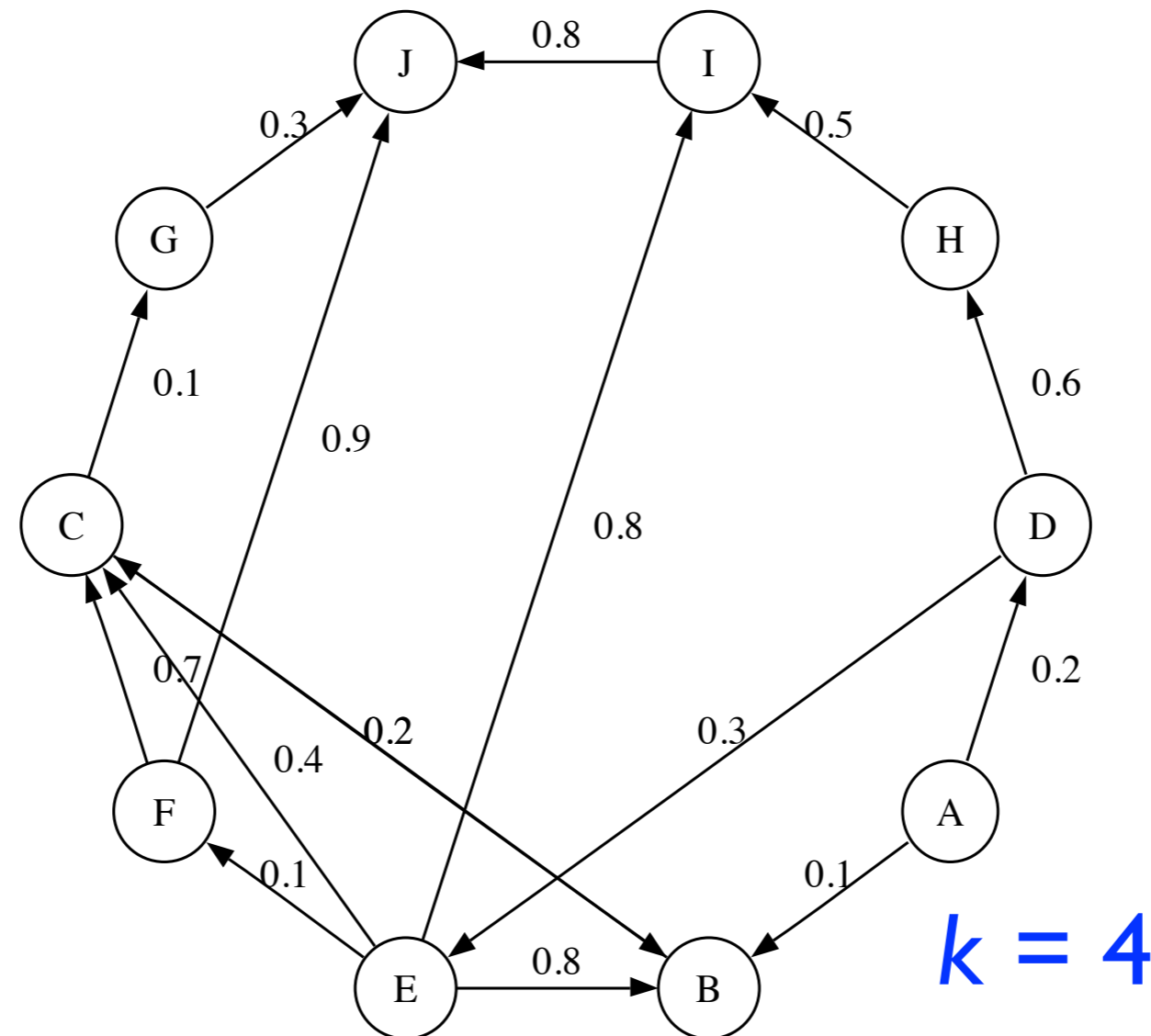
$$\begin{aligned} \frac{\partial \mathcal{H}}{\partial Q_j} &= \sum_{k=1}^p I_{jk}^S g'(Q_j^T L_k) (g(Q_j^T L_k) - s_{jk}^*) L_k \\ &+ \alpha_r \sum_{i=1}^m I_{ij}^R g'(U_i^T Q_j) (g(U_i^T Q_j) - r_{ij}^*) U_i + \alpha_q Q_j, \end{aligned}$$

$$\frac{\partial \mathcal{H}}{\partial L_k} = \sum_{j=1}^n I_{jk}^S g'(Q_j^T L_k) (g(Q_j^T L_k) - s_{jk}^*) Q_j + \alpha_l L_k,$$

Only the **Q matrix**, the queries' latent features, is being used to generate the **query similarity graph!**



# Query Similarity Graph



- Similarities are calculated using queries' latent features
- Only the **top- $k$**  similar neighbors (terms) are kept



# Similarity Propagation

- Based on the **Heat Diffusion Model**
- In the query graph, given the **heat sources** and the **initial heat values**, start the heat diffusion process and perform  **$P$  steps**
- Return the **Top- $N$**  queries in terms of highest heat values for query suggestions



# Heat Diffusion Model

- Heat diffusion is a **physical phenomena**
- Heat flows from **high** temperature to **low** temperature in a **medium**
- **Heat kernel** is used to describe the amount of heat that one point receives from another point
- The way that heat diffuse varies when the **underlying geometry** varies

$$\rho C_P \frac{\partial T}{\partial t} = Q + \nabla \cdot (k \nabla T)$$

$\rho$  Density

$C_P$  Heat capacity and constant pressure

$\frac{\partial T}{\partial t}$  Change in temperature over time

$Q$  Heat added

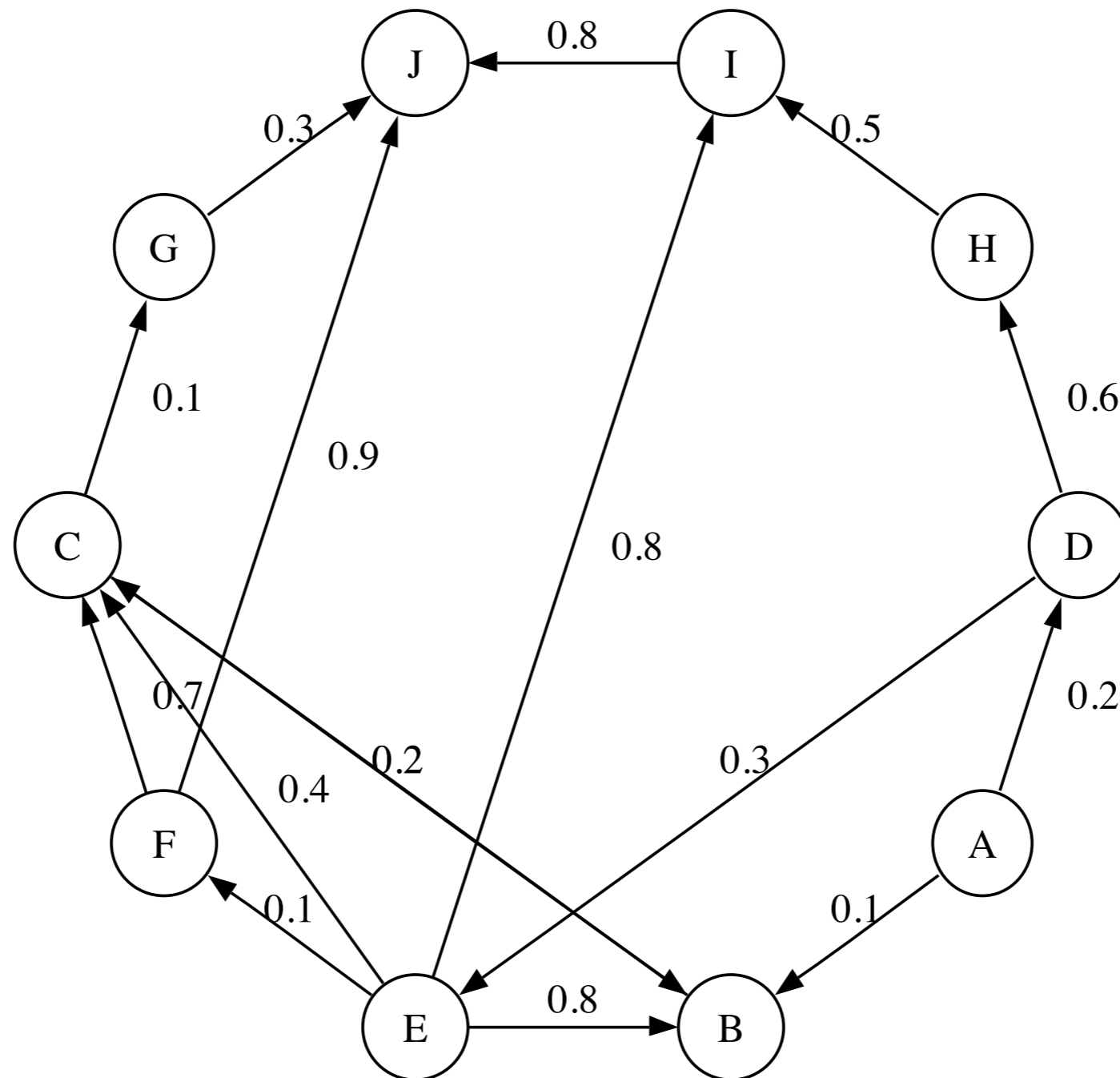
$k$  Thermal conductivity

$\nabla T$  Temperature gradient

$\nabla \cdot \mathbf{v}$  Divergence



# Heat Diffusion Process



# Similarity Propagation Model

$$\frac{f_i(t + \Delta t) - f_i(t)}{\Delta t} = \alpha \left( -\frac{\tau_i}{d_i} f_i(t) \sum_{k:(q_i, q_k) \in E} w_{ik} + \sum_{j:(q_j, q_i) \in E} \frac{w_{ji}}{d_j} f_j(t) \right) \quad (1)$$

$$\mathbf{f}(1) = e^{\alpha \mathbf{H}} \mathbf{f}(0) \quad (2)$$

$$H_{ij} = \begin{cases} w_{ji}/d_j, & (q_j, q_i) \in E, \\ -(\tau_i/d_i) \sum_{k:(i,k) \in E} w_{ik}, & i = j, \\ 0, & \text{otherwise.} \end{cases} \quad (3)$$

$$\mathbf{f}(1) = e^{\alpha \mathbf{R}} \mathbf{f}(0), \quad \mathbf{R} = \gamma \mathbf{H} + (1 - \gamma) \mathbf{g} \mathbf{1}^T \quad (4)$$

$\alpha$  Thermal conductivity

$d_i$  Heat value of node  $i$  at time  $t$

$f_i(t)$  Heat value of node  $i$  at time  $t$

$w_{ik}$  Weight between node  $i$  and node  $k$

$\mathbf{f}(0)$  Vector of the initial heat distribution

$\mathbf{f}(1)$  Vector of the heat distribution at time 1

$\tau_i$  Equal to 1 if node  $i$  has outlinks, else equal to 0

$\gamma$  Random jump parameter, and set to 0.85

$\mathbf{g}$  Uniform stochastic distribution vector



# Discrete Approximation

- Compute  $e^{\alpha \mathbf{R}}$  is time consuming
- We use the **discrete approximation** to substitute

$$\mathbf{f}(1) = \left( \mathbf{I} + \frac{\alpha}{P} \mathbf{R} \right)^P \mathbf{f}(0)$$

- For every heat source, only diffuse heat to its neighbors within  **$P$  steps**
- In our experiments,  $P = 3$  already generates fairly good results





# Query Suggestion Procedure

- For a given query  $q$ 
  1. Select a set of  $n$  queries, each of which contains at least one word in common with  $q$ , as **heat sources**
  2. Calculate the initial heat values by
$$f_{\hat{q}_i}(0) = \frac{|\mathcal{W}(q) \cap \mathcal{W}(\hat{q}_i)|}{|\mathcal{W}(q) \cup \mathcal{W}(\hat{q}_i)|}$$

$q = \text{"Sony"}$   
 $\text{"Sony"} = 1$   
 $\text{"Sony Electronics"} = 1/2$   
 $\text{"Sony Vaio Laptop"} = 1/3$
  3. Use  $\mathbf{f}(1) = e^{\alpha \mathbf{R}} \mathbf{f}(0)$  to diffuse the heat in graph
  4. Obtain the **Top- $N$**  queries from  $\mathbf{f}(1)$



# Physical Meaning of $\alpha$

- If set  $\alpha$  to a large value
  - The results depend more on the query graph, and **more semantically** related to original queries, e.g., **travel => lowest air fare**
- If set  $\alpha$  to a small value
  - The results depend more on the initial heat distributions, and **more literally** similar to original queries, e.g., **travel => travel insurance**



# Experimental Dataset

Data Source	Clickthrough data from AOL search	After Pre-Processing
Collection Period	March 2006 to May 2006 (3 months)	
Lines of Logs	19,442,629	
Unique user IDs	657,426	192,371
Unique queries	4,802,520	224,165
Unique URLs	1,606,326	343,302
Unique words		69,937



# Pre-processing

- Computer set-up  
Intel Pentium D CPU, 3.0 Gz, Dual Core with 1G memory
- Keep **valid** words which contains only 'a', 'b', ..., 'z' and spaces
- Remove those queries which appear less than **three times**



# Query Suggestions

Table 2: Examples of LSQS Query Suggestion Results ( $k = 50$ )

Testing Queries	Suggestions				
	$\alpha = 10$			$\alpha = 1000$	
	Top 1	Top 2	Top 3	Top 4	Top 5
michael jordan	michael jordan shoes	michael jordan bio	pictures of michael jordan	nba playoff	nba standings
travel	travel insurance	abc travel	travel companions	hotel tickets	lowest air fare
java	sun java	java script	java search	sun microsystems inc	virtual machine
global services	ibm global services	global technical services	staffing services	temporary agency	manpower professional
walt disney land	world of disney	disney world orlando	disney world theme park	disneyland grand hotel	disneyland in california
intel	intel vs amd	amd vs intel	pentium d	pentium	centrino
job hunt	jobs in maryland	monster job	jobs in mississippi	work from home online	monster board
photography	photography classes	portrait photography	wedding photography	adobe elements	canon lens
internet explorer	ms internet explorer	internet explorer repair	internet explorer upgrade	microsoft com	security update
fitness	fitness magazine	lifestyles family fitness	fitness connection	womens health magazine	family fitness
m schumacher	schumacher	red bull racing	formula one racing	ferrari cars	formula one
solar system	solar system project	solar system facts	solar system planets	planet jupiter	mars facts
sunglasses	replica sunglasses	cheap sunglasses	discount sunglasses	safilo	marhon
search engine	audio search engine	best search engine	search engine optimization	song lyrics search	search by google
disease	grovers disease	liver disease	morgellons disease	colic in babies	oklahoma vital records
pizzahut	pizza hut menu	pizza coupons	pizza hut coupons	papa johns pizza coupon	papa johns
health care	health care proxy	universal health care	free health care	great west healthcare	uhc
flower delivery	global flower delivery	online florist	flowers online	send flowers	virtual flower
wedding	wedding guide	wedding reception ideas	wedding decoration	unity candle	centerpiece ideas
astronomy	astronomy magazine	astronomy pic of the day	star charts	space pictures	comet



# Emerging Issues

- **Theory** and models
- **Search, mining, and ranking** 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, privacy, trust, and risk** issues
- **Monetization** of social interactions
- Software **platforms** and development **tools**

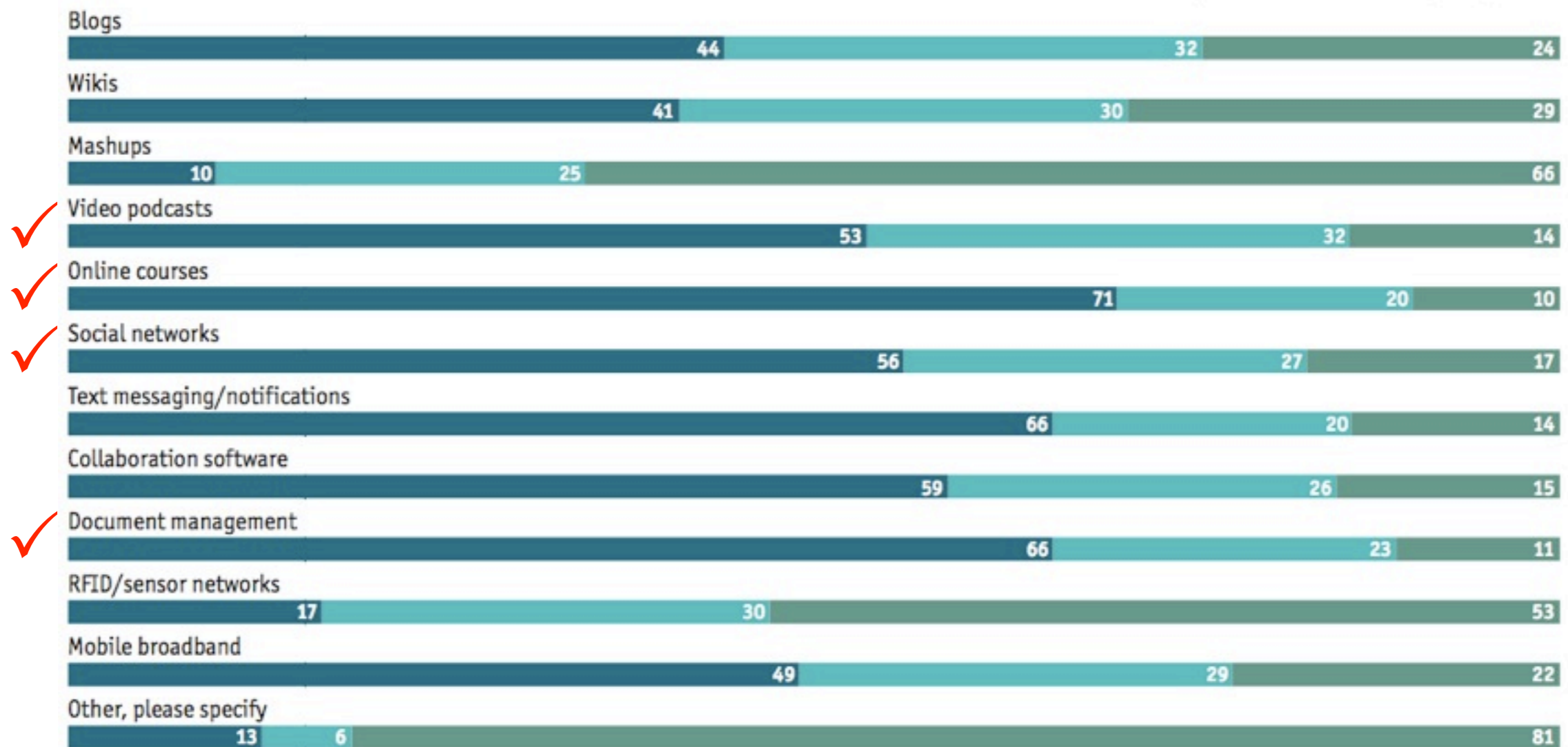


# Economist Intelligent Unit 2008

Which tools does your institution currently use, and which do you think will be used within five years?

(% respondents)

■ Use now    ■ Within five years    ■ Don't know/Not applicable



# Concluding Remarks

- The **Era of Social Computing** is here to stay!
- **Relations are important!**
- Discovering **new paradigms** by blending different **social media** and interactions
- Be concerned about computational techniques to **search, rank, and mine** data and information to achieve **collective intelligence/wisdom**





# Acknowledgments

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- Zhenjiang Lin (Ph.D.)
- Hao Ma (Ph.D.)
- Mingzhe Mo (M.Phil.)
- Dingyan Wang (M.Phil.)
- Wei Wang (M.Phil.)
- Haiqin Yang (Ph.D.)
- Connie Yuen (Ph.D.)
- Xin Xin (Ph.D.)
- Chao Zhou (Ph.D.)
- Yi Zhu (Ph.D.)



# On-Going Research

## Machine Learning

- Heavy-Tailed Symmetric Stochastic Neighbor Embedding ([NIPS'09](#))
- Adaptive Regularization for Transductive Support Vector Machine ([NIPS'09](#))
- Direct Zero-norm Optimization for Feature Selection ([ICDM'08](#))
- Semi-supervised Learning from General Unlabeled Data ([ICDM'08](#))
- Learning with Consistency between Inductive Functions and Kernels ([NIPS'08](#))
- An Extended Level Method for Efficient Multiple Kernel Learning ([NIPS'08](#))
- Semi-supervised Text Categorization by Active Search ([CIKM'08](#))
- Transductive Support Vector Machine ([NIPS'07](#))
- Global and local learning ([ICML'04](#), [JMLR'04](#))



# On-Going Research

## Web Intelligence/Information Retrieval

- A Generalized Co-HITS Algorithm and Its Application to Bipartite Graphs ([KDD'09](#))
- Entropy-biased Models for Query Representation on the Click Graph ([SIGIR'09](#))
- Effective Latent Space Graph-based Re-ranking Model with Global Consistency ([WSDM'09](#))
- Formal Models for Expert Finding on DBLP Bibliography Data ([ICDM'08](#))
- Learning Latent Semantic Relations from Query Logs for Query Suggestion ([CIKM'08](#))
- RATE: a Review of Reviewers in a Manuscript Review Process ([WI'08](#))
- MatchSim: link-based web page similarity measurements ([WI'07](#))
- Diffusion rank: Ranking web pages based on heat diffusion equations ([SIGIR'07](#))
- Web text classification ([WWW'07](#))



# On-Going Research

## Recommender Systems/Collaborative Filtering

- Learning to Recommend with Social Trust Ensemble ([SIRIR'09](#))
- Semi-Nonnegative Matrix Factorization with Global Statistical Consistency in Collaborative Filtering ([CIKM'09](#))
- Recommender system: accurate recommendation based on sparse matrix ([SIGIR'07](#))
- SoRec: Social Recommendation Using Probabilistic Matrix Factorization ([CIKM'08](#))

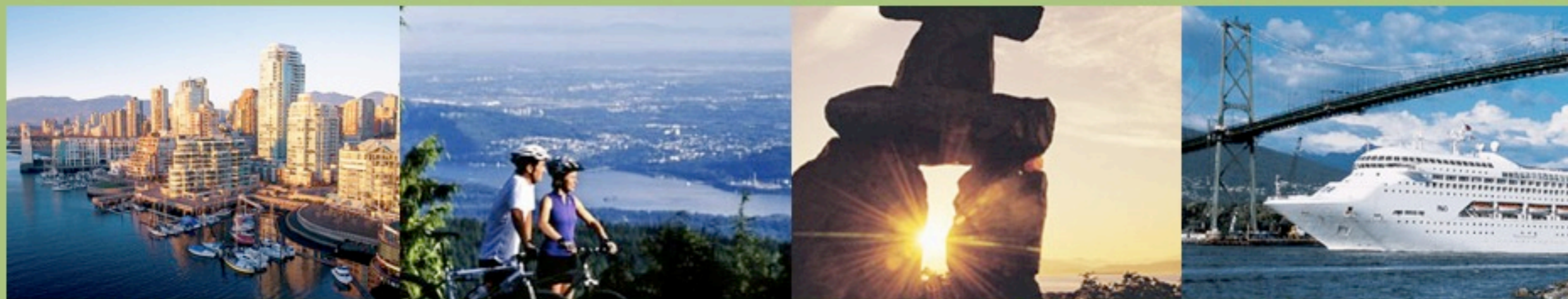
## Human Computation

- A Survey of Human Computation Systems ([SCA'09](#))
- Mathematical Modeling of Social Games ([SIAG'09](#))
- An Analytical Study of Puzzle Selection Strategies for the ESP Game ([WV'08](#))
- An Analytical Approach to Optimizing The Utility of ESP Games ([WV'08](#))



<http://groups.google.com/group/WSCE2009>

# Call for Papers



**Workshop on Social Computing in Education (WSCE2009)**  
in conjunction with SocialComp-09, August 29-31, 2009, Vancouver, Canada

Welcome to the workshop on Social Computing in Education (SCE2009). The workshop is held in conjunction with the [SocialComp-09](#), Vancouver, Canada from August 29-31, 2009.

With the advent of Web 2.0 and related technologies, Social Computing has become a new paradigm in ways we communicate, learn, and educate. Social platforms such as wikis, blogs, twitters, forums, groups, podcasts, mashups, virtual worlds, and sites for social networking, recommender systems, social bookmarking, social news, knowledge sharing, etc. are generating novel ways we acquire, access, manipulate, process, retrieve, present, and visualize information in the teaching and learning space. The social media for education has become dynamic, ubiquitous, distributed, real-time, collaborative, bottom-up, many-to-many, value-based, and personalized. This workshop solicits contributions on using Social Computing and related technologies for education, the emerging applications of Web 2.0 as an educational platform, as well as privacy, risk, security, and policy issues associated in Social Computing for Education 2.0.



Irwin King  
Ricardo Baeza-Yates (Eds.)

King · Baeza-Yates (Eds.)

King · Baeza-Yates (Eds.)

## Weaving Services and People on the World Wide Web

Ever since its inception, the Web has changed the landscape of human experiences on how we interact with one another and data through service infrastructures via various computing devices. This interweaving environment is now becoming ever more embedded into devices and systems that integrate seamlessly on how we live, both in our working or leisure time.

For this volume, King and Baeza-Yates selected some pioneering and cutting-edge research work that is pointing to the future of the Web. Based on the Workshop Track of the 17th International World Wide Web Conference (WWW2008) in Beijing, they selected the top contributions and asked the authors to resubmit their work with a minimum of one third of additional material from their original workshop manuscripts to be considered for this volume. After a second-round of reviews and selection, 16 contributions were finally accepted.

The work within this volume represents the tip of an iceberg of the many exciting advancements on the WWW. It covers topics like semantic web services, location-based and mobile applications, personalized and context-dependent user interfaces, social networks, and folksonomies.

The presentations aim at researchers in academia and industry by showcasing latest research findings. Overall they deliver an excellent picture of the current state-of-the-art, and will also serve as the basis for ongoing research discussions and point to new directions.

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Weaving Services and People  
on the World Wide Web

# Weaving Services and People on the World Wide Web

 Springer



# Economist Intelligent Unit 2008

**In what ways do new technologies pose the greatest challenges and risks to colleges and universities? Select up to three.**  
(% of respondents)

Potential increase in student plagiarism

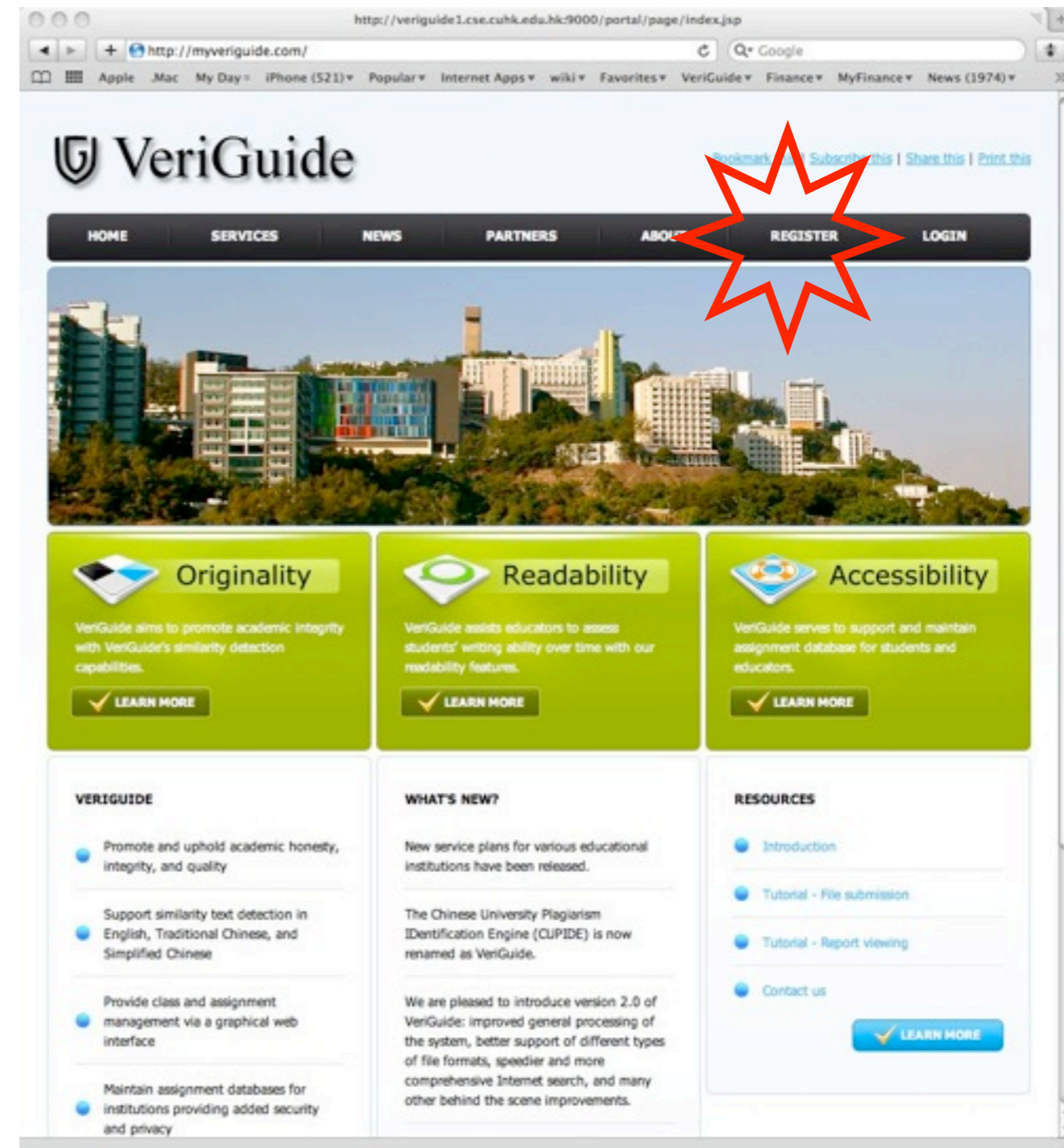
51

Potential increase in student plagiarism



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The screenshot shows a personal website for Irwin King. The header features a logo on the left and the text "IRWIN KING @ WEB INTELLIGENCE & SOCIAL COMPUTING LAB" on the right. Below the header, there is a breadcrumb trail: "Trace: > confs > record2008 > home" and "You are here: home". The main content area is divided into several sections: "NAVIGATION" with links to Home, Profile, and Research Interests & Projects; "ABOUT US" with links to News | Newsletter, Research Group | Presentations, Collaborators, and Contact Us; "PUBLICATIONS" with a numbered list of 8 items including Conference Papers, Journal Articles, Books, and Theses; "PROFESSIONAL ACTIVITIES" with a numbered list of 7 items including Professional Achievements, Awards, Grants, Teaching, Education Excellence, Demos & Software, and Conference Activities. The central part of the page features a portrait of Irwin King, followed by his name and title: "Irwin King (金國慶), WISC Lab". Below this, his education and affiliations are listed: Associate Professor, B.Sc. (Caltech), M.Sc., Ph.D. (USC), SMIEEE (CIS), MACM, MINNS, APNNA. His department and university are also mentioned: Department of Computer Science and Engineering, The Chinese University of Hong Kong, Shatin, NT, Hong Kong. Contact information includes phone, fax, and email. A list of professional roles and activities follows, such as Associate Editor of IEEE TNN, IEEE CIM, and APNNA, and various workshop co-chairs. A "Research interests" section lists machine learning, social computing, and web intelligence. A quote from Caltech is included: "...the truth shall set you free." A "News" section at the bottom lists various conferences and events where he has participated, such as ICNIP'09, CollaborateCom2009, CIKM2009, ACML'09, ICCCI'09, APSIPA ASC 2009, WI'09, SocialCom-09, SIGIR2009, IJCAI-09, CASoN2009, IWSSIP2009, IJCNN2009, and FAW2009. A red starburst logo with a 'G' is overlaid on the right side of the screenshot.

<http://www.cse.cuhk.edu.hk/~king>

The Era of Social Computing, Irwin King, The Future Generation Information Technology (FGIT2009), December 11, 2009, Jeju Island, Korea



# Q & A

