

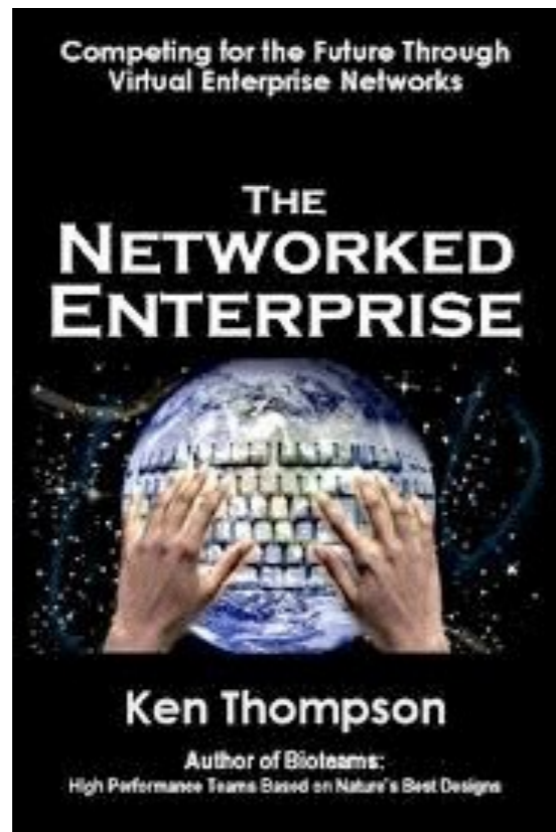
Smart Synchronization on Social Collaboration

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Background

- Large scale organization (a number of users & a large amount of data)





Collaboration tools in enterprise computing environment



Agenda

- Contextual Synchronization
- Social contextualization
- Social media communication
- Examples
- Conclusion

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What is contextual
synchronization?

Synchronization

- happening, existing, or arising at **precisely the same time**
- recurring or operating at **exactly the same periods**
- [Merriam-Webster]

Synchronization



Synchronization

- (cont.) Data synchronization refers to the idea of keeping **multiple copies of a dataset** in coherence with one another, or to **maintain data integrity**. Process synchronization primitives are commonly used to implement data synchronization. [http://en.wikipedia.org/wiki/Synchronization_\(computer_science\)](http://en.wikipedia.org/wiki/Synchronization_(computer_science))



Synchronization

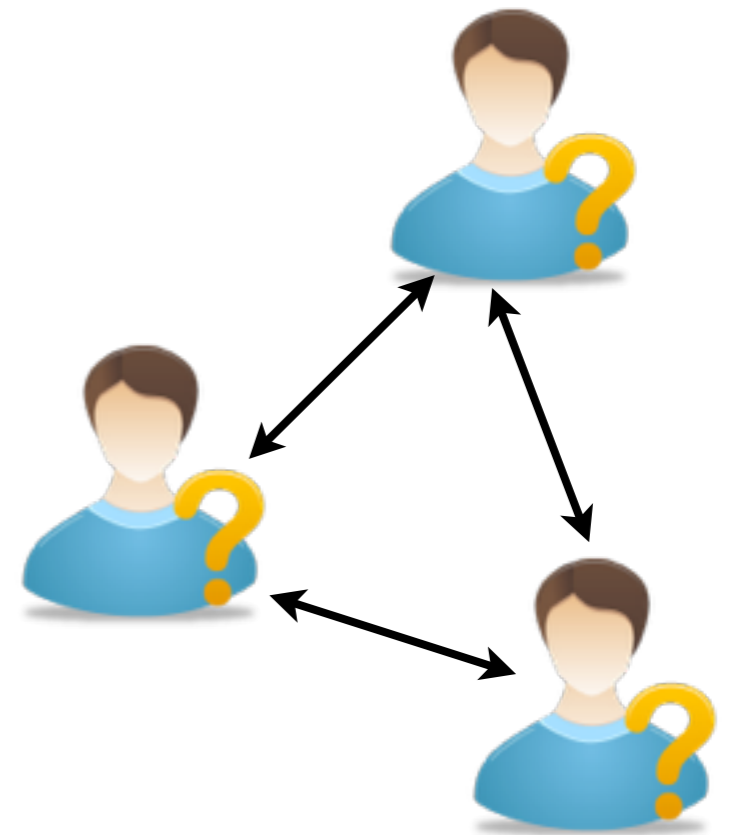
- A set of communication actions in proper order

1. Send(a, b)
 2. Ack(b, a)
 3. Send(b, c)
 4. Ack(c, b), Ack(c, a)
-



Contextual Synchronization

- **Contextual** synchronization refers to the idea of keeping **multiple USERS** in coherence with one another, or to **maintain data integrity** by considering their **contexts**.

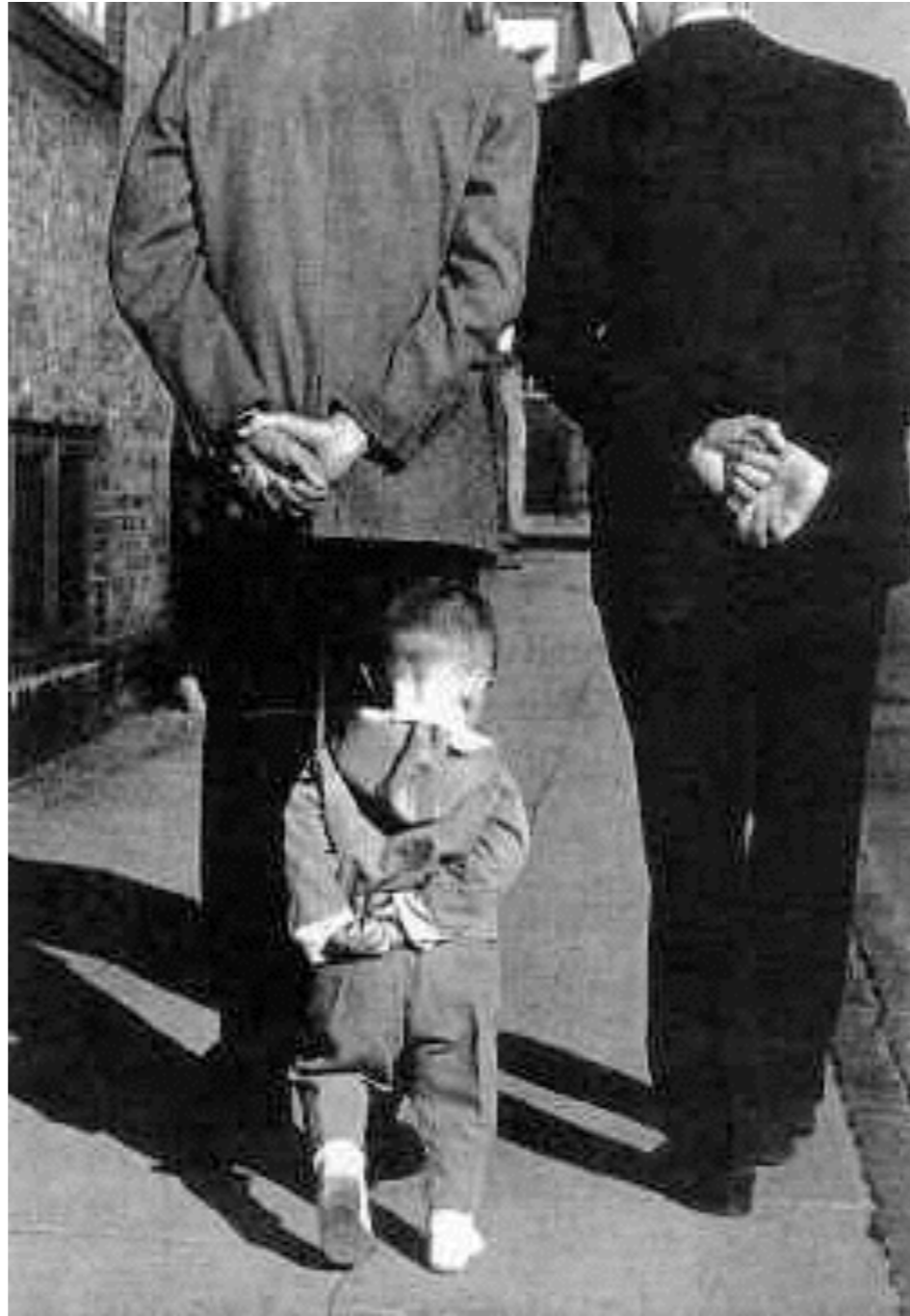


Information Propagation





Behavior Mimicry



Third Party Observation of Mimicry



Participant



Mimic
(Interviewee)

Model
(Interviewer)

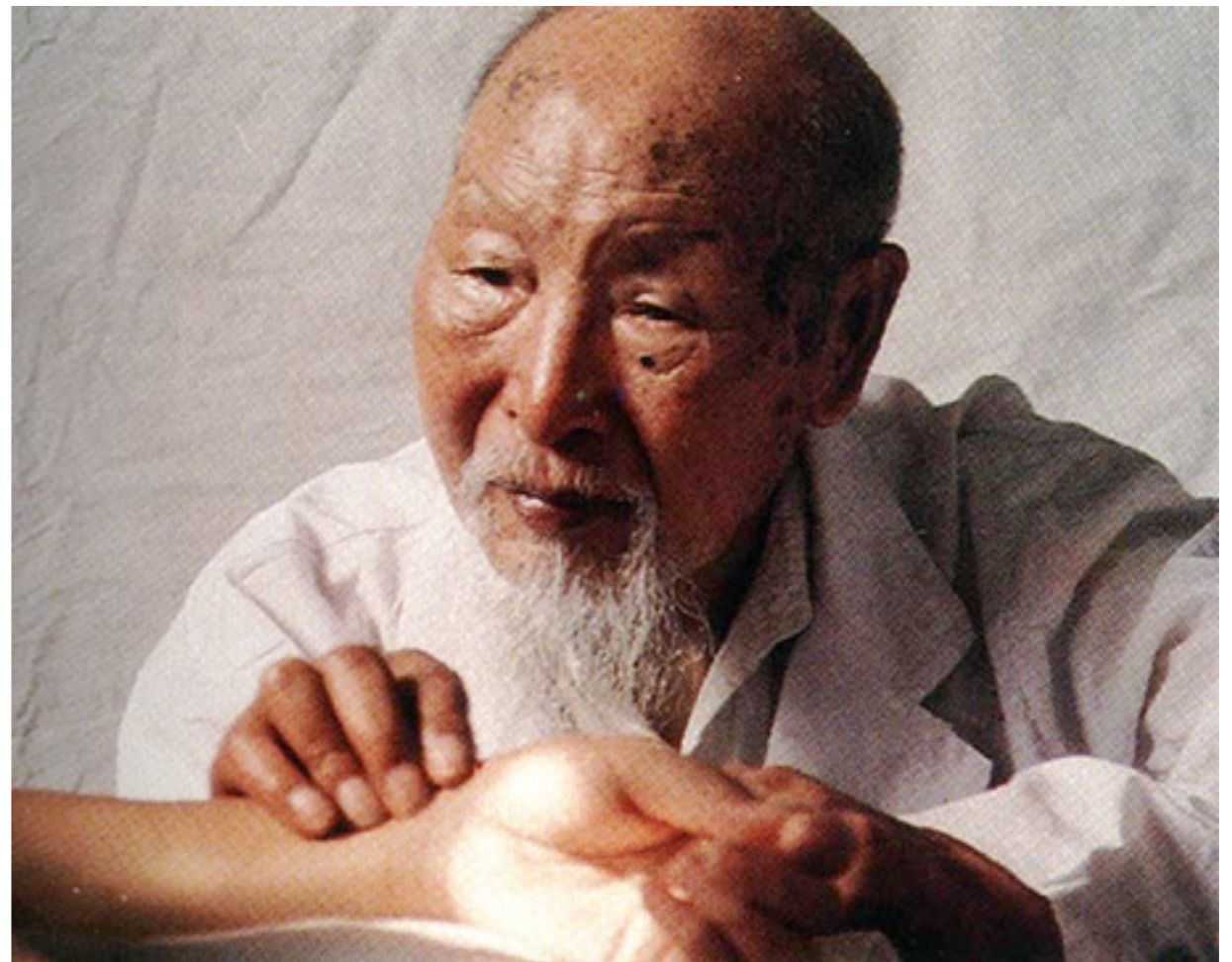


Tagoole

- Understanding various features of information propagation
- How quickly a certain information is propagated?
- How widely ?
- Why ?

Xuan Hau Pham, Jason J. Jung, Dosam Hwang,
"Beating social pulse: Understanding
information propagation via online social
tagging systems," Journal of Universal
Computer Science, Vol. 18, No. 8, pp.
1022-1031, 2012

Building Social Pulse



Folksonomy



Temporal Folksonomy

T+Folksonomy

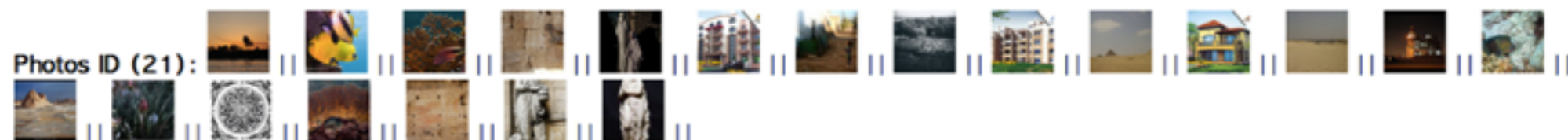
- Temporal distribution of frequencies
- Inducibility, a relationship between two arbitrary tags

tagoole Flickr.com

Tag: **egypt**

Number of tags 1502893

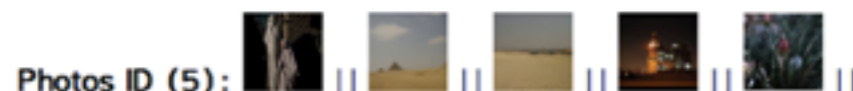
[Egypt](#)



Username (14): [Chris Firth](#) || [Dolphin1932](#) || [Dolphin1932](#) || [Soloegipto](#) || [vanvan](#) || [Coldwell Banker New Homes](#) || [Helen Bailey](#) || [sonofwalrus](#) || [Coldwell Banker New Homes](#) || [GameMusicCompilation](#) || [Coldwell Banker New Homes](#) || [GameMusicCompilation](#) || [Ahmed MK](#) || [Andreas Metz](#) || [jpmis](#) || [AzmirRahman](#) || [FABOLAND](#) || [Dolphin1932](#) || [Soloegipto](#) || [Majaa M](#) || [Majaa M](#)

Timestamp: 2010-02-21 || 2012-03-12 || 2012-03-13 || 2011-10-14 || 2012-03-19 || 2012-02-14 || 2012-01-06 || 2012-02-10 || 2012-02-14 || 2012-02-20 || 2012-02-14 || 2012-02-20 || 2009-08-05 || 2011-07-25 || 2012-02-15 || 2012-03-20 || 2012-03-18 || 2012-03-14 || 2011-10-14 || 2012-03-19 || 2012-03-19 ||

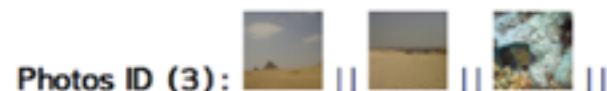
[cairo](#)



Username (4): [vanvan](#) || [GameMusicCompilation](#) || [GameMusicCompilation](#) || [Ahmed MK](#) || [AzmirRahman](#) ||

Timestamp: 2012-03-19 || 2012-02-20 || 2012-02-20 || 2009-08-05 || 2012-03-20 ||

[africa](#)



Username (2): [GameMusicCompilation](#) || [GameMusicCompilation](#) || [Andreas Metz](#) ||

Timestamp: 2012-02-20 || 2012-02-20 || 2011-07-25 ||

Browser tabs: Gmail - Inbox, Gmail - Inbox, Advanced Scien, 165.229.229.1, adm12.agentr, Gmail - Inbox, Gmail - Inbox, Special Issue of

Address bar: 165.229.229.159/socifolk/tagoole.php?key=egypt&key2=Libya&opt=c1

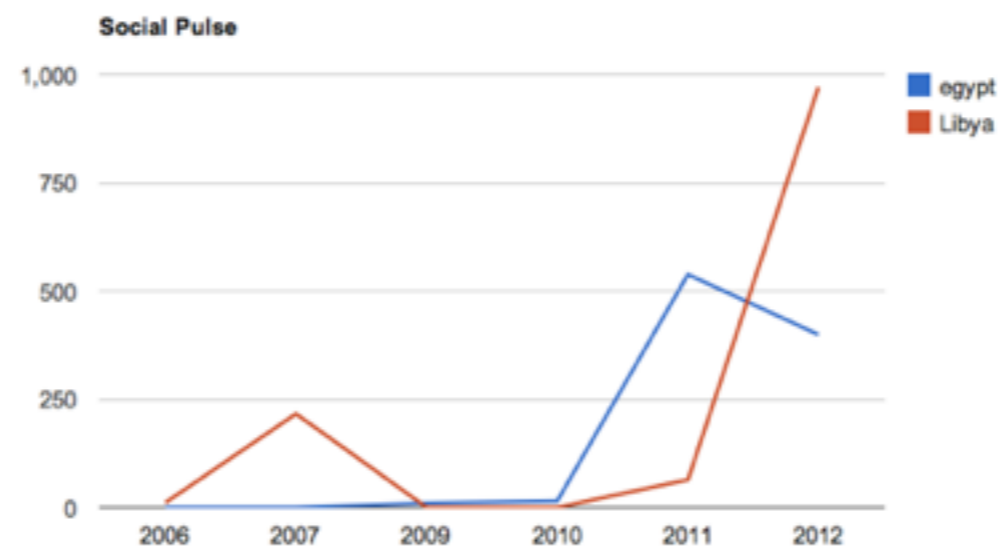
Bookmarks: m.google, m.intelligent, Elsevier-Author Trac, Web of Knowledge, 기타 북마크

tagoole Flickr.com

Compare two tags: **egypt** and **Libya**

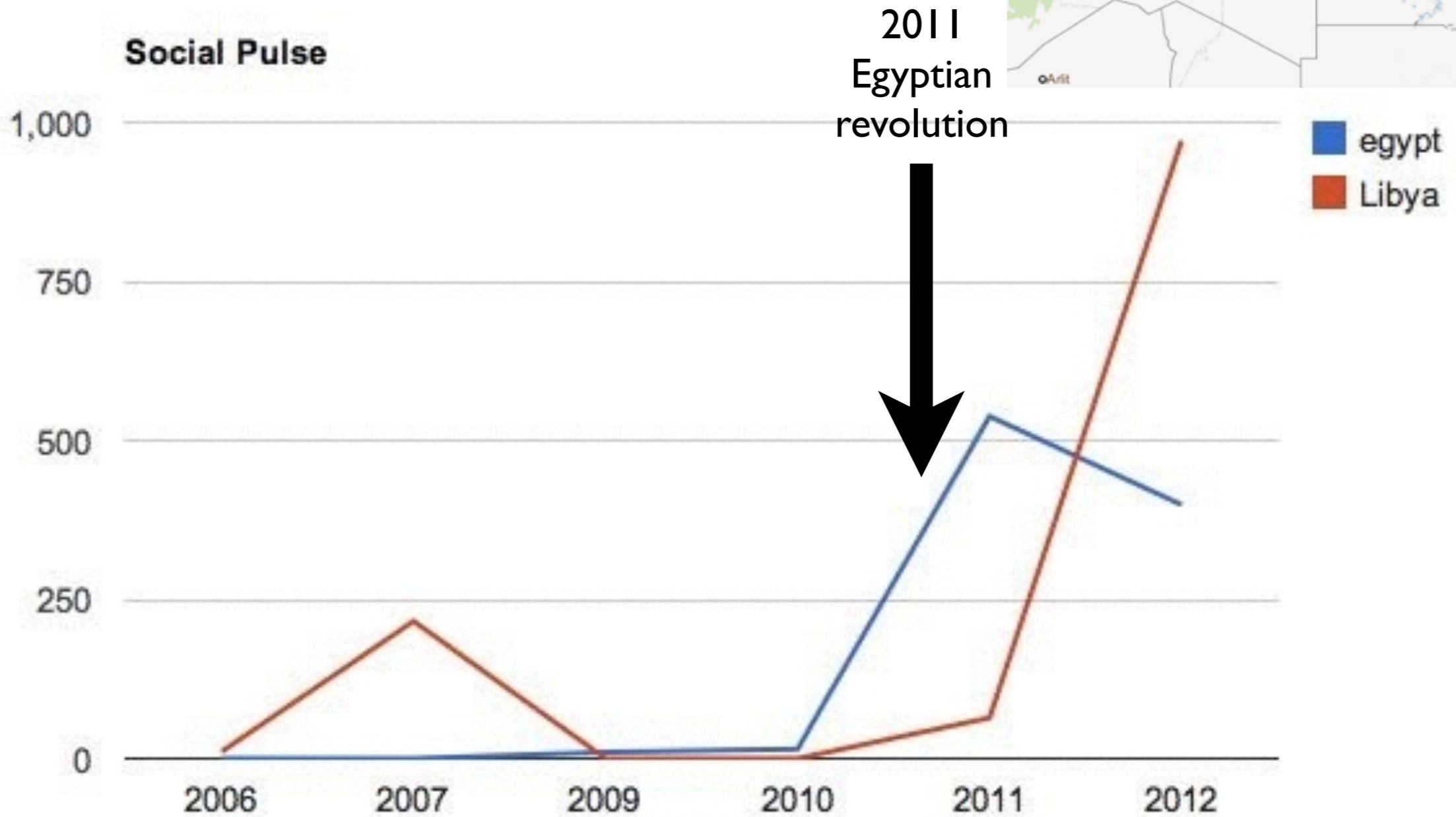
Inducibility: 18.341245530321

egypt	Libya
Number of users: 28 ++	Number of users: 29 ++
Number of tags: 1502900	Number of tags: 81941

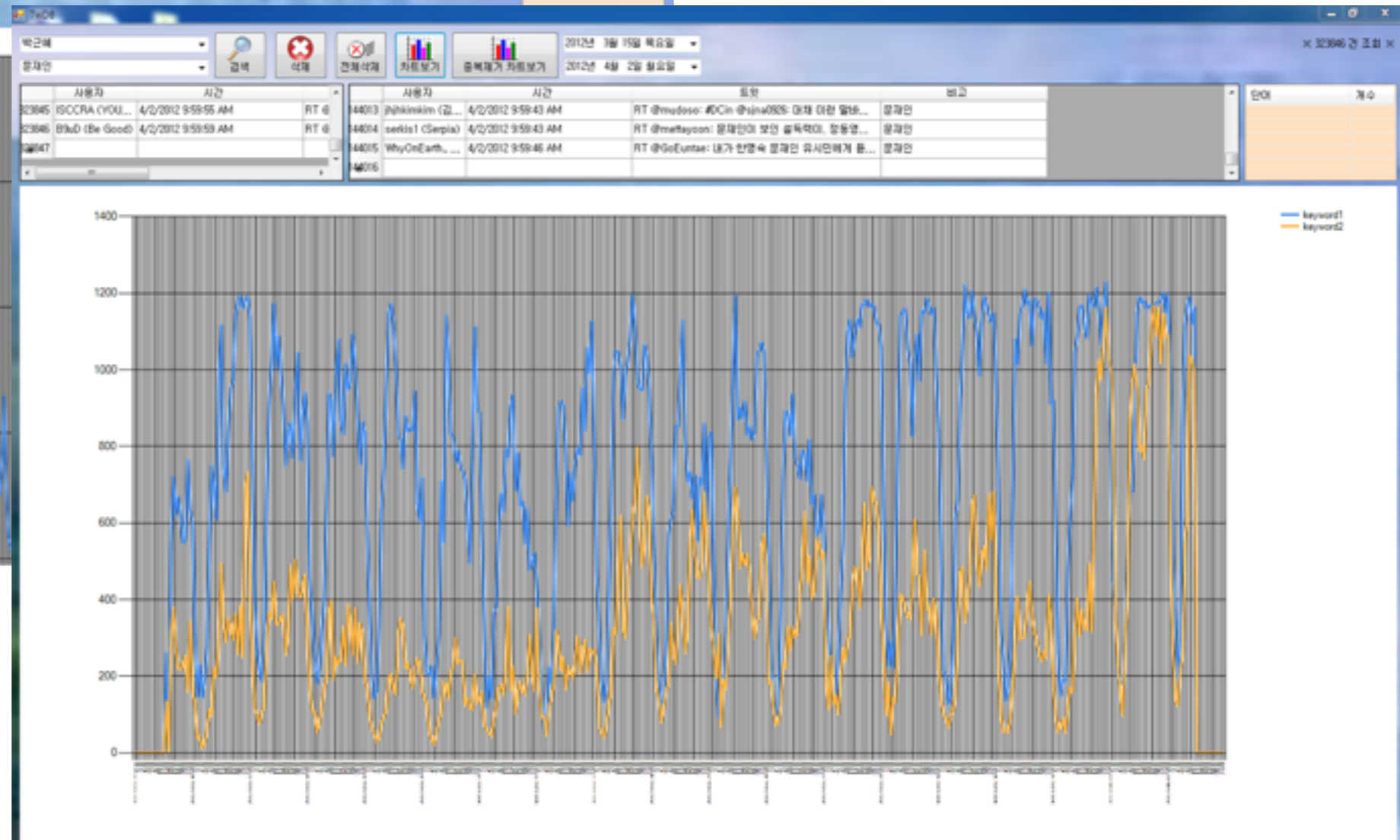
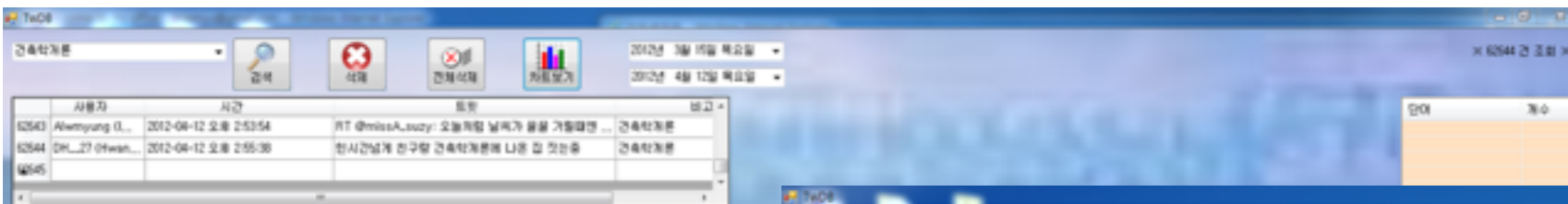


File bar: JUCS-SNAA Issue.xls, deliveringsnana3.zip, deliveringsnana2.zip, KNOSYS-D-12-00233.pdf, 모두 표시

Arab Spring



TweetPulse



Agenda

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- **Social contextualization**
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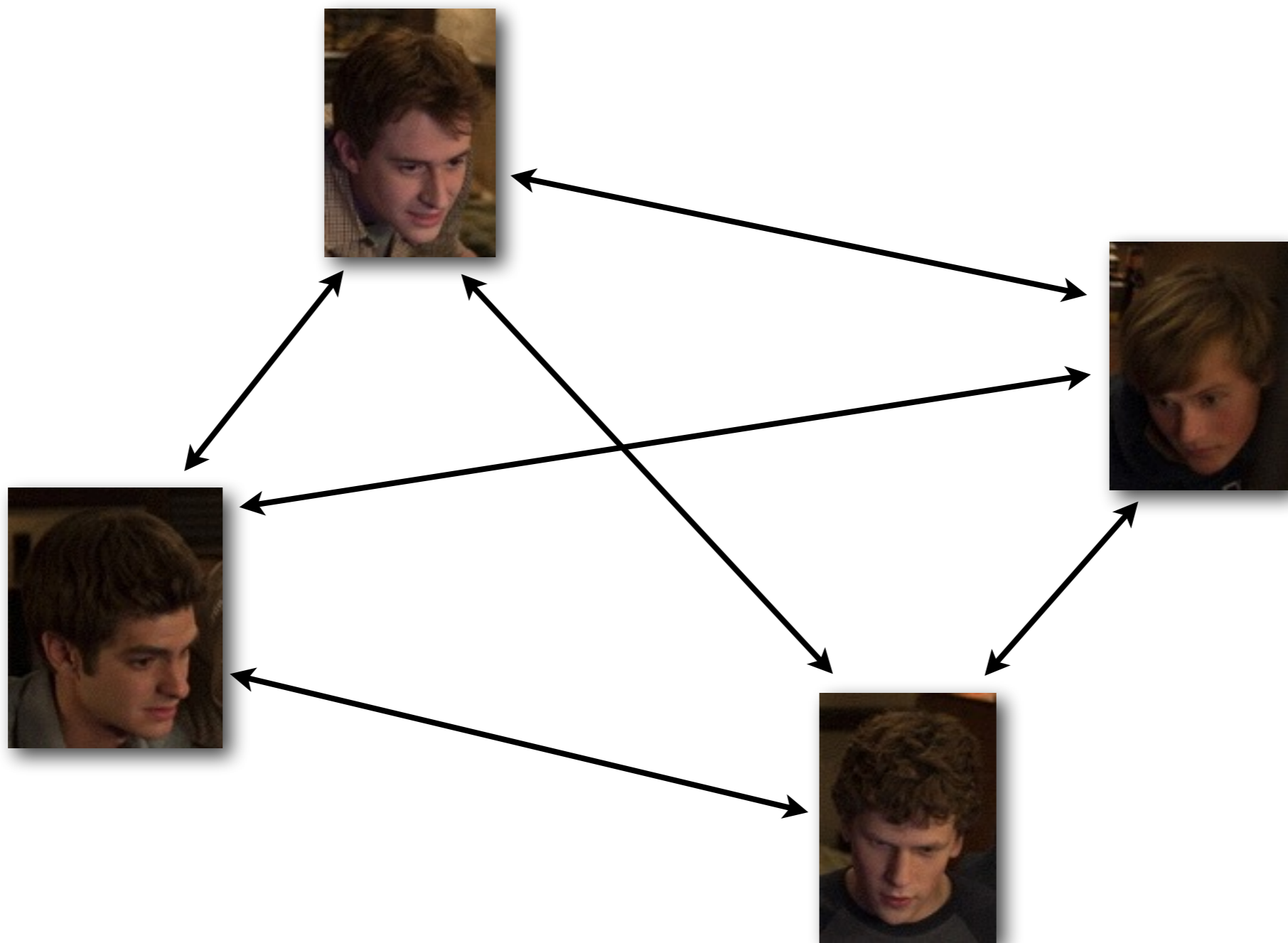
Context-aware services

- Location
- Time
- Any other context?

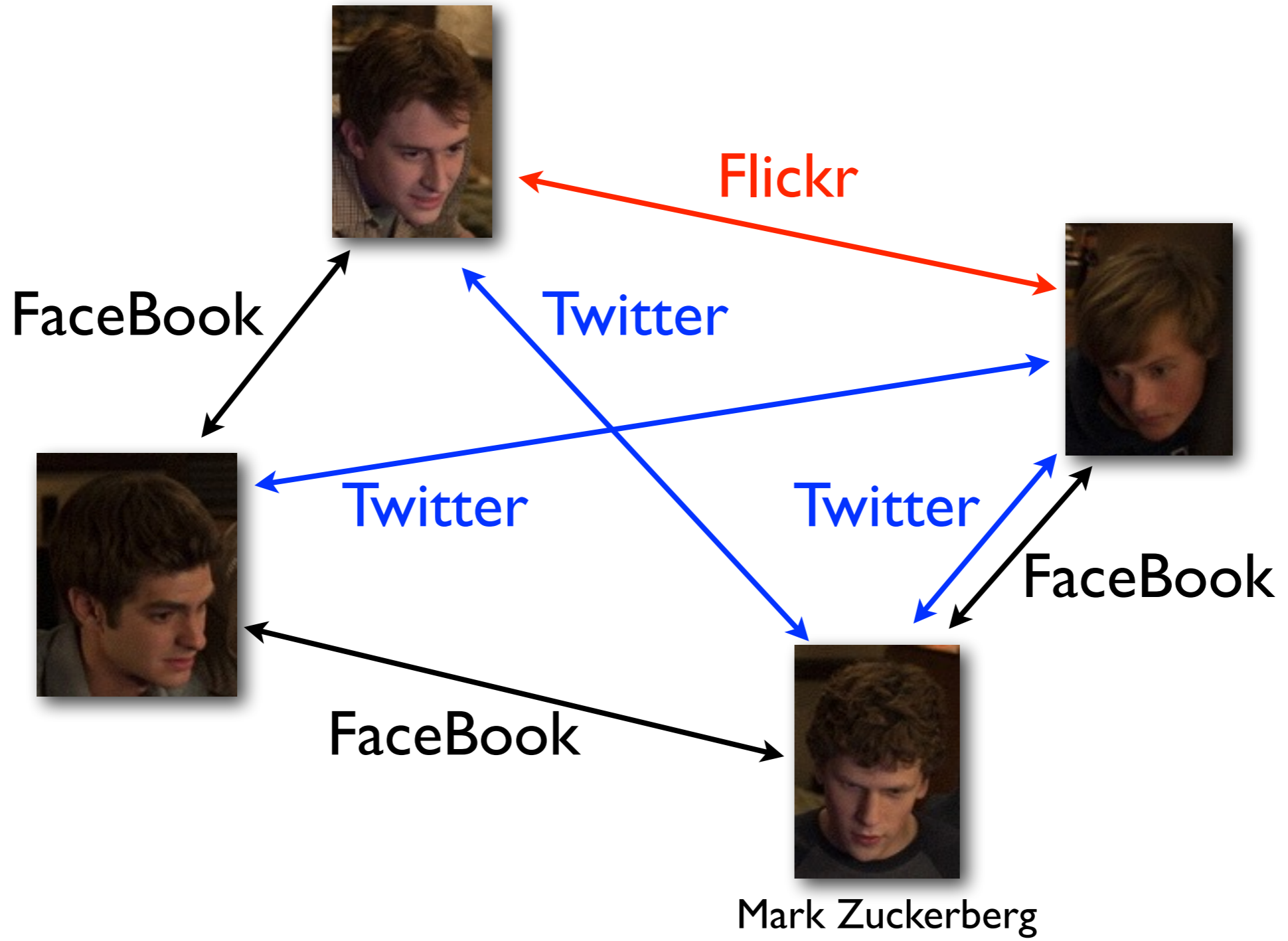




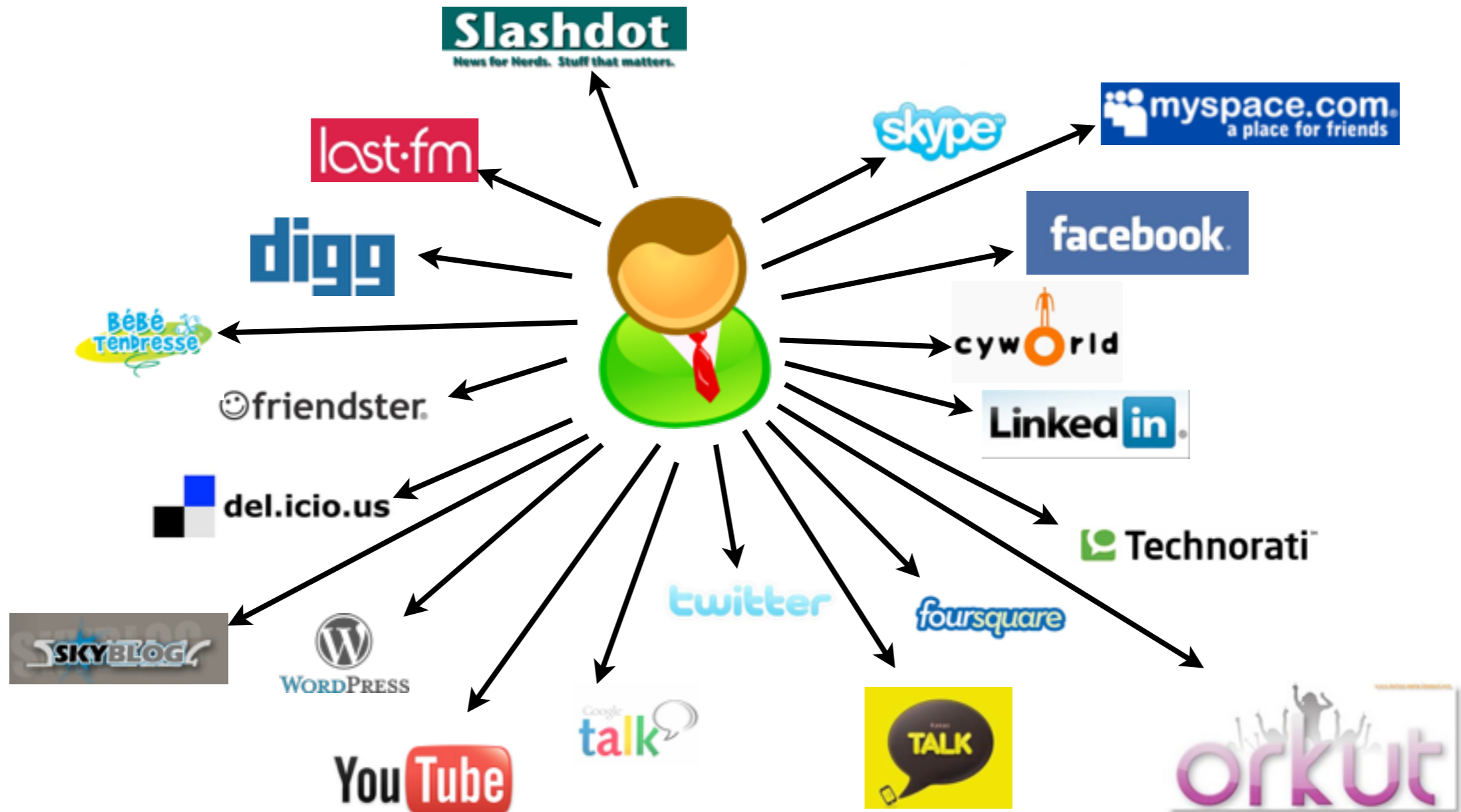
Social networks (2010)



Mark Zuckerberg



With a number of online social media, our social networks are distributed

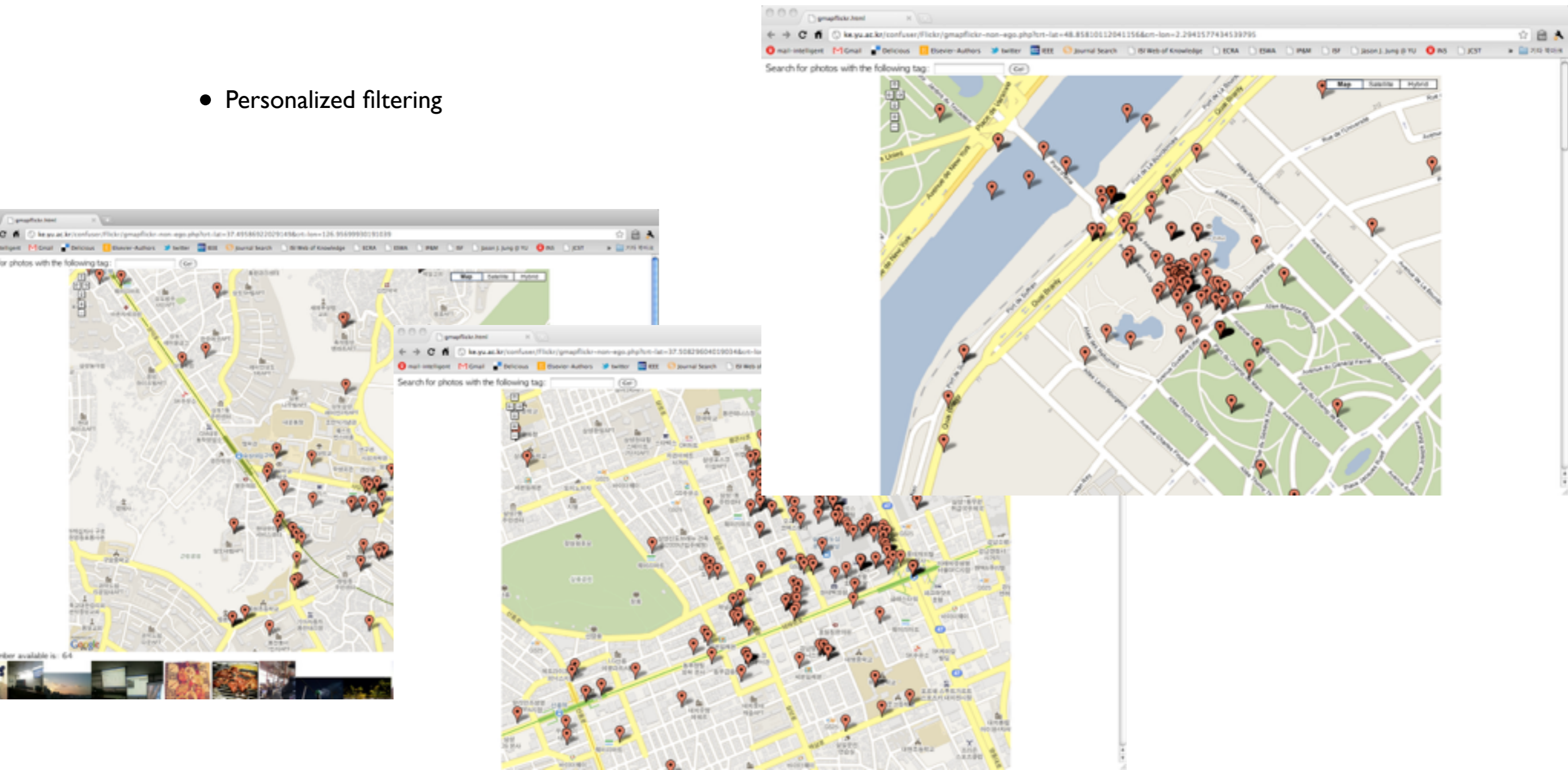


Ego-centric Social Network (e-SN)

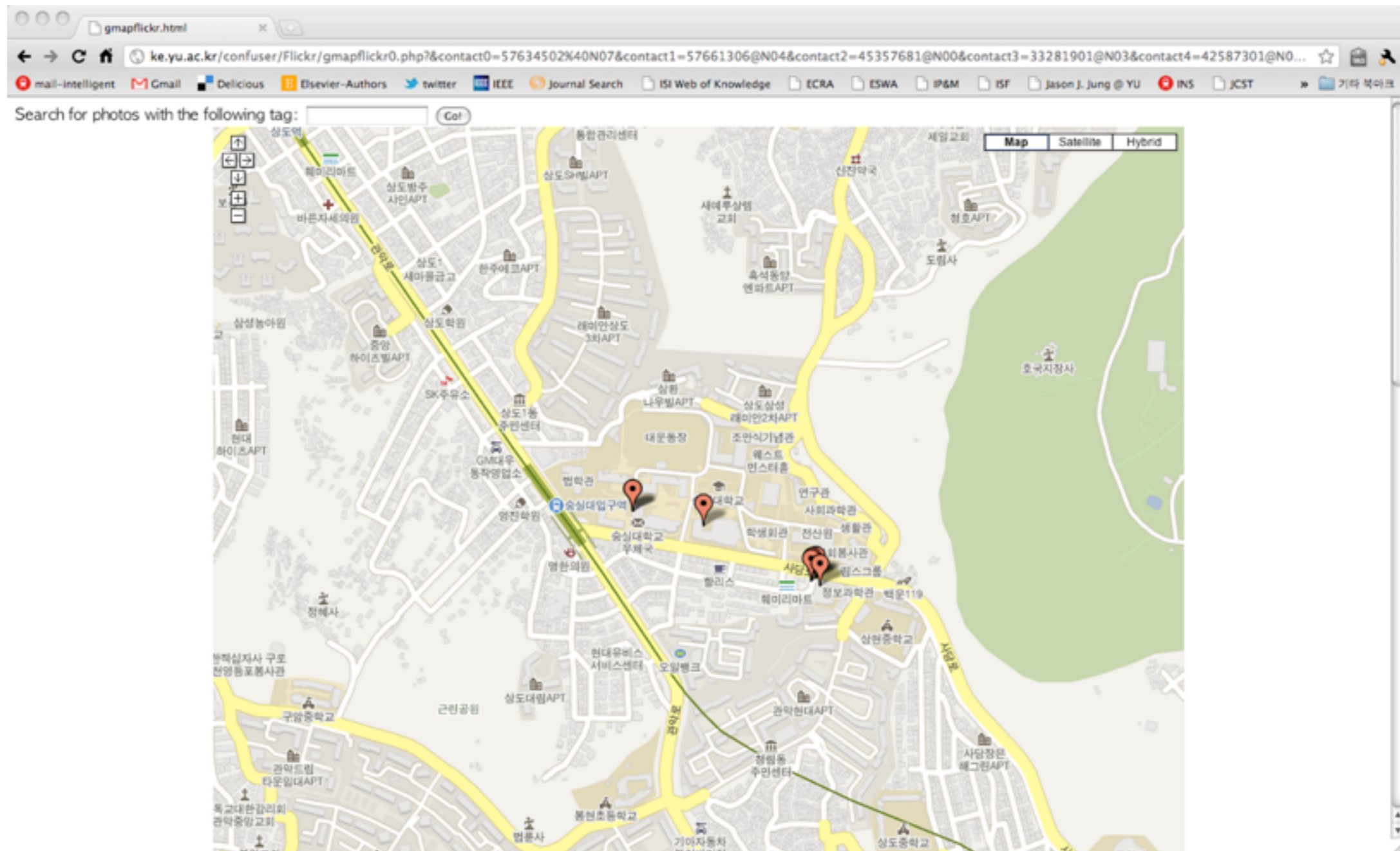
- Social networks are distributed in many different applications, e.g., Facebook and Twitter.
- Thus, the partial social networks have to be integrated to build an ego-centric social network.

Why e-SN?

- Personalized filtering



Only from my neighbors



Social contextualization

- Context fusion
 - We need to collect all possible information (e.g., resources and knowledge) from our neighbors.
 - Fusing contextual information around target users

Contextualization

- To provide context-aware services, e-SN should be contextualized with
 - location
 - time
 - context of my neighbors
- Need to consider to exploit the planner module

Scenario on Context Fusion

- It is my wife's birthday, tomorrow.
- I am in “Puerta del Sol” for a technical meeting.



Current Location
"Puerta del Sol"



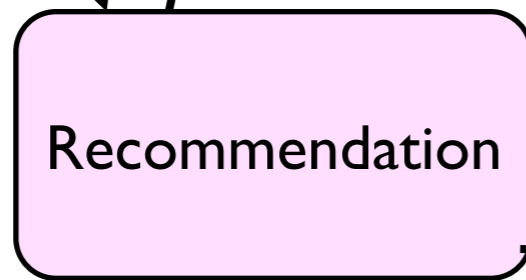
My Wife's Birthday
Tomorrow



My wife's favorite movies



Recommendation



Promotion news
from "El Corte Inglés"
<https://twitter.com/elcorteingles>



Restaurants and Cafes
near Current location



Reality mining for TelCon

- Building a social network by mobile phone usage patterns
- How often (or how long) has Ua called Ub?
- Inferring semantics of each social links between users
- What is the relationship between Ua and Ub?

Jason J. Jung, Hojin Lee, Kwang Sun Choi, "Contextualized Recommendation Based on Reality Mining from Mobile Subscribers," *Cybernetics and Systems*, Vol. 40, No. 2, pp. 160-175, 2009.

Agenda

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- Social contextualization
- **Social media communication**
- Examples
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Social media communication

- A number of communication media among users
- E-mail, Telephone, SMS, Video conferencing, Instant messaging, and so on.

Chulmo Koo, Yulia Wati, Jason J. Jung, "Examination of how Social Aspects Moderate the Relationship between Task Characteristics and Usage of Social Communications Technologies (SCTs) in Organizations," International Journal of Information Management, Vol. 31, No. 5, pp. 445-459, 2011.

Question: How (and Why)
people choose the SCTs?

Social affinities (context)

- Vertical vs. Horizontal
- e.g., “Ask **your boss** to answer.” and “Ask **your students** to come”
- Also, cultural differences

Task characteristics

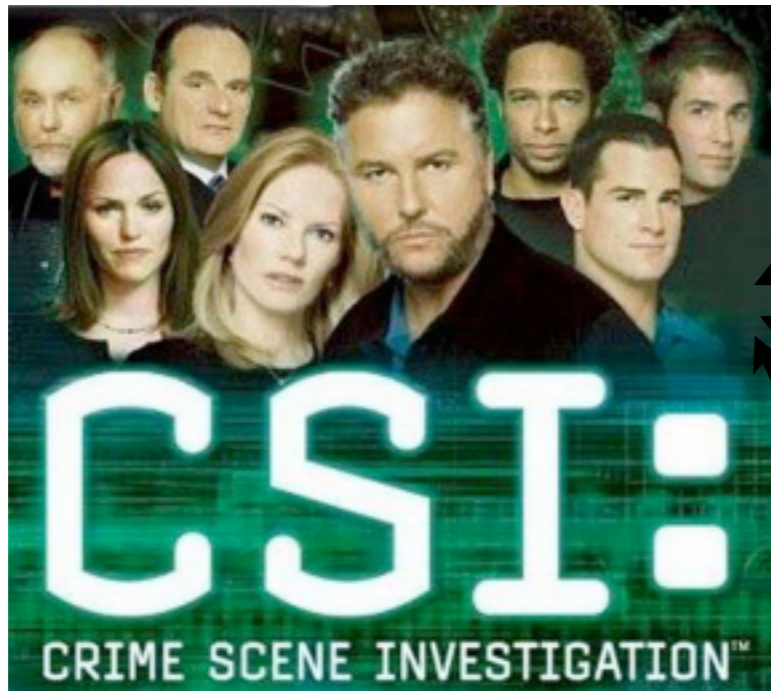
- Urgency (e.g., “Find the answer **right now**”)
- Complexity (e.g., “Explain what is the **capital of Portugal**” and “Tell me what is **contextual synchronization**”)
- Multiplicity (e.g., 1:1, 1:N, and M:N communications)

Media richness



- Need to weigh a SCT
- $\text{Weight}(\text{email}) > \text{Weight}(\text{SMS})$

Example



Jason J. Jung, "Boosting Social Collaborations Based on Contextual Synchronization: An Empirical Study," *Expert Systems with Applications*, Vol. 38, No. 5, pp. 4809-4815, 2011.



Capt. Jim Brass
LVPD Homicide
Detective

Al Robbins
Chief Medical
Examiner

Warrick Brown
CSI Level 3

Gil Grissom
CSI Night-Shift
Supervisor

Sara Sidle
CSI Level 3

Nick Stokes
CSI Level 3
Hair and fiber analysis

Greg Sanders
CSI Level 2

Catherine Willows
CSI Asst. Night-Shift
Supervisor









Vision

Cross-media Communication

Ask @Gil and @Robbin who the murderer is.

Google Search

I'm Feeling Lucky



Wrap-up

- The main research question is
 - “How to support users to efficiently collaborate with each other?”
- Ontologies? Linked Data?
- Any questions & comments

