Contextual Synchronization on Social Collaboration

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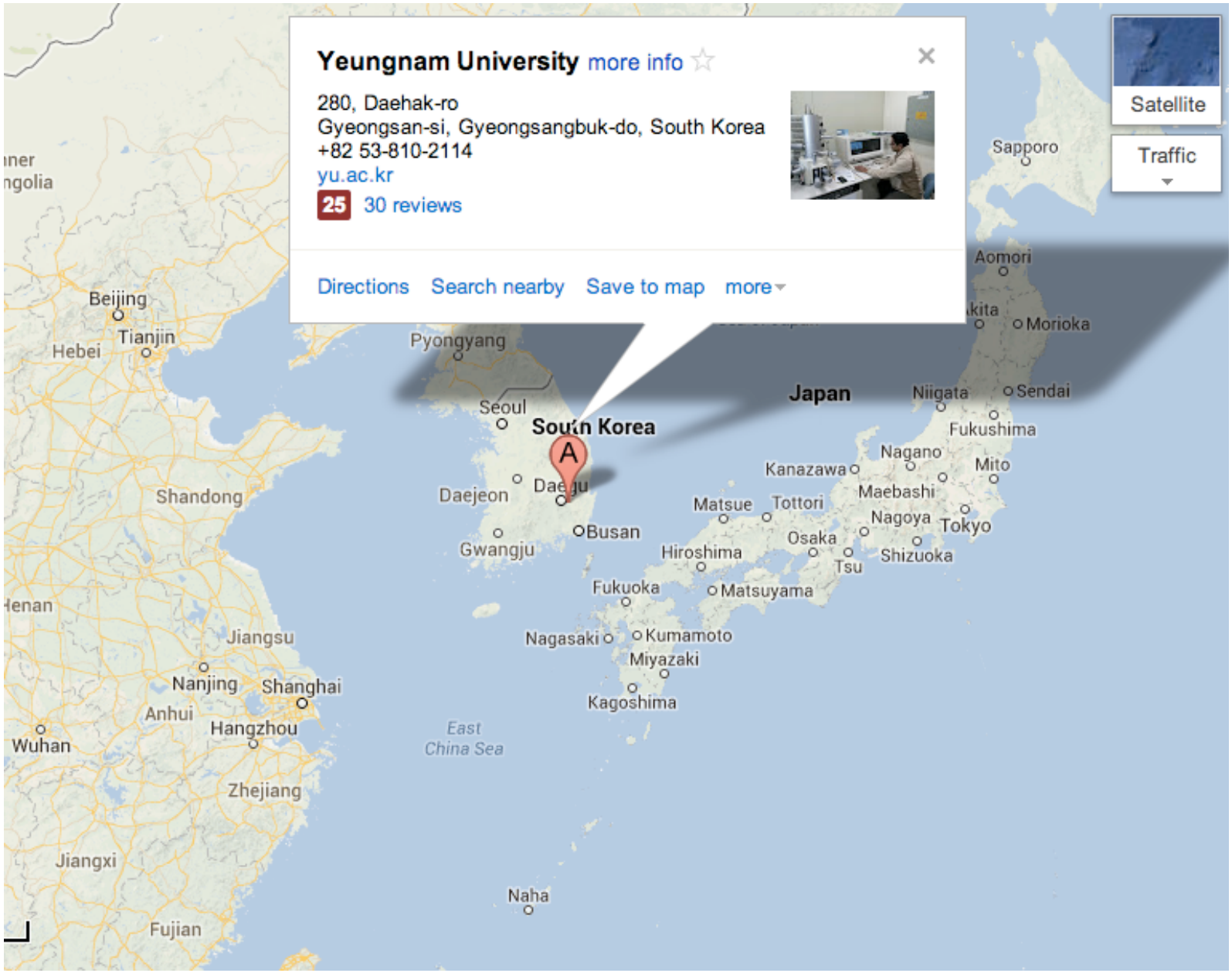
The 3rd International Conference on Web Intelligence, Mining and Semantics (WIMS'13) in Madrid, Spain

Short Introduction

- Yeungnam University, Daegu, Korea
- Nguyen Tat Thanh University, HCMC, Korea
- University of Malaya, Kuala Lumpur, Malaysia



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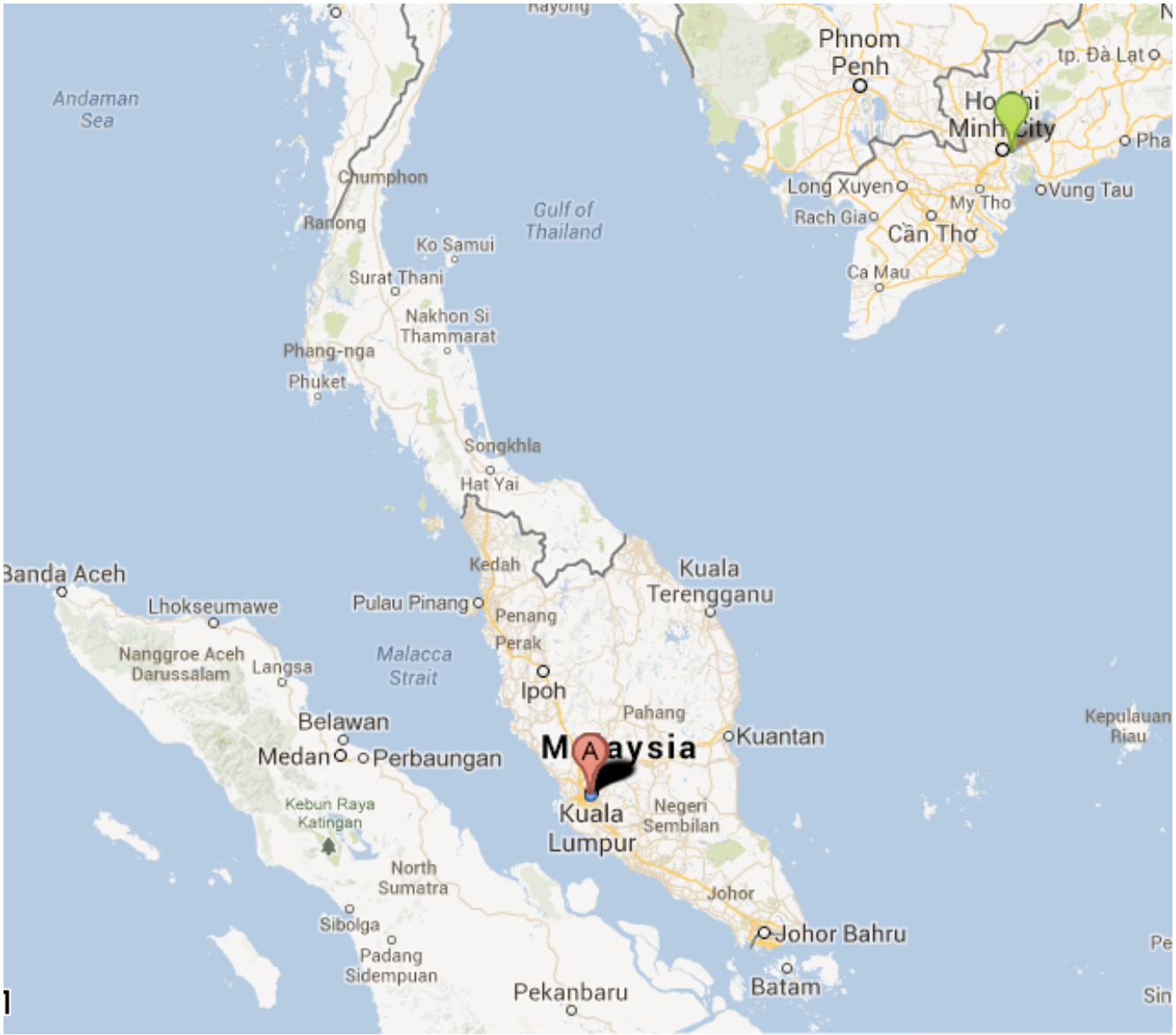

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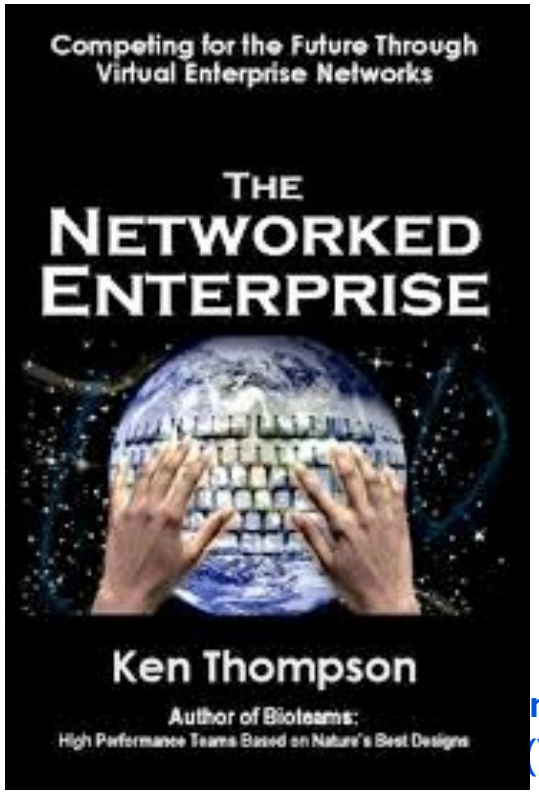
Background

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



nference on Web Intelligence, Mining and
(WIMS'13) in Madrid, Spain

Collaboration tools in enterprise computing environment

The 3rd International Conference
Semantics (WIMS'13) in Madrid, Spain

Agenda

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

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What is contextual synchronization?

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Synchronization

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

Synchronization

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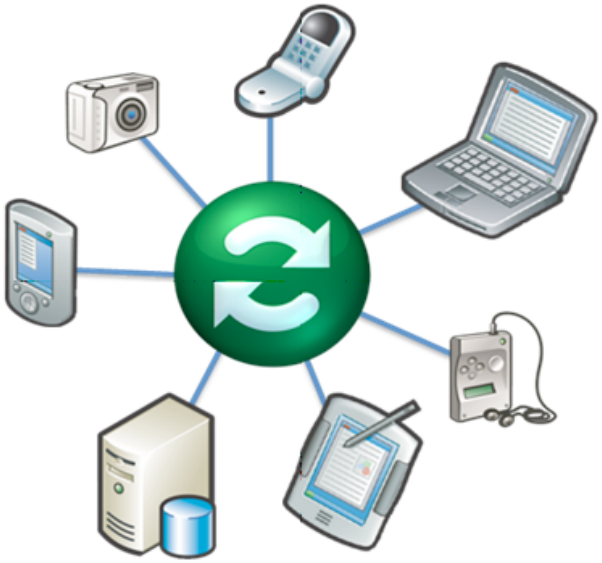
Synchronization

- (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)



Synchronization

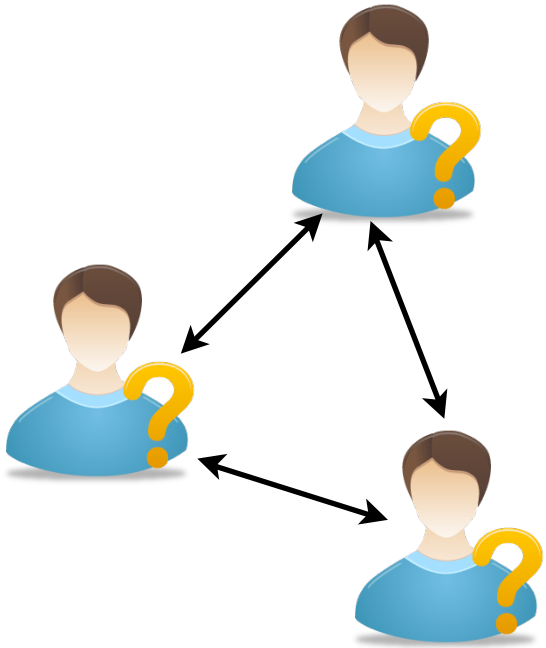
- A set of communication actions in proper order

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

stomp
.com.sg
PHOTO ILLUSTRATION

Behavior Mimicry

Third Party Observation of Mimicry

The 99%
Will Not Be
SILENT!

The 99%
Will Not Be
SILENT!

The 99%
Will Not Be
SILENT!

Tagoole

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

Tagoole

- Understanding various features of information propagation

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

Tagoole

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

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

Tagoole

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

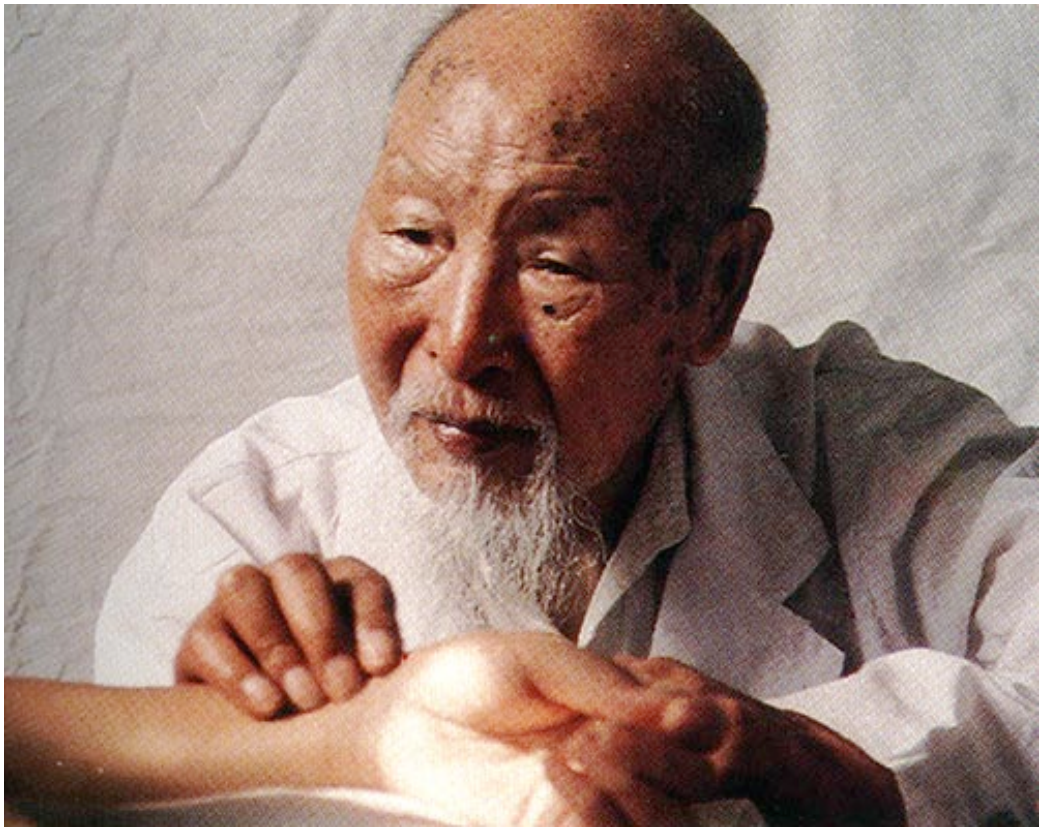
Xuan Hau Pham, Jason J. Jung, Dosam Hwang, "Beating social pulse: Understanding information propagation via online social tagging systems," Journal of Universal Computer Science, Vol. 18, No. 8, pp. 1022-1031, 2012

Tagoole

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

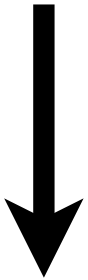
Xuan Hau Pham, Jason J. Jung, Dosam Hwang, "Beating social pulse: Understanding information propagation via online social tagging systems," Journal of Universal Computer Science, Vol. 18, No. 8, pp. 1022-1031, 2012

Building Social Pulse



Folksonomy

Folksonomy



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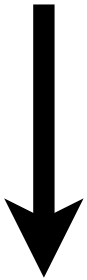


Temporal Folksonomy

T+Folksonomy

T+Folksonomy

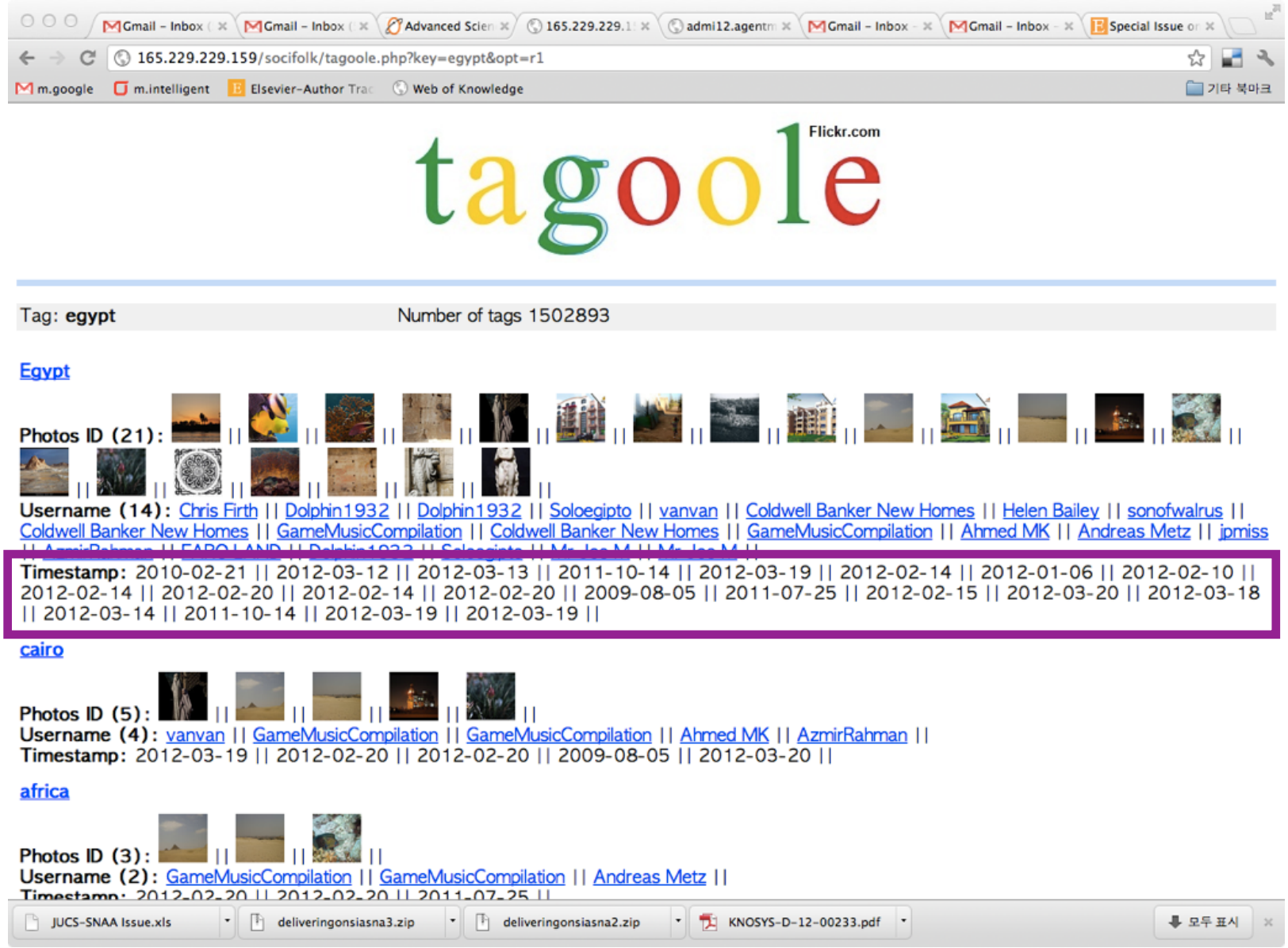
- Temporal distribution of frequencies

T+Folksonomy

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

Demo

http://165.229.229.159/tagoole/tagoole.php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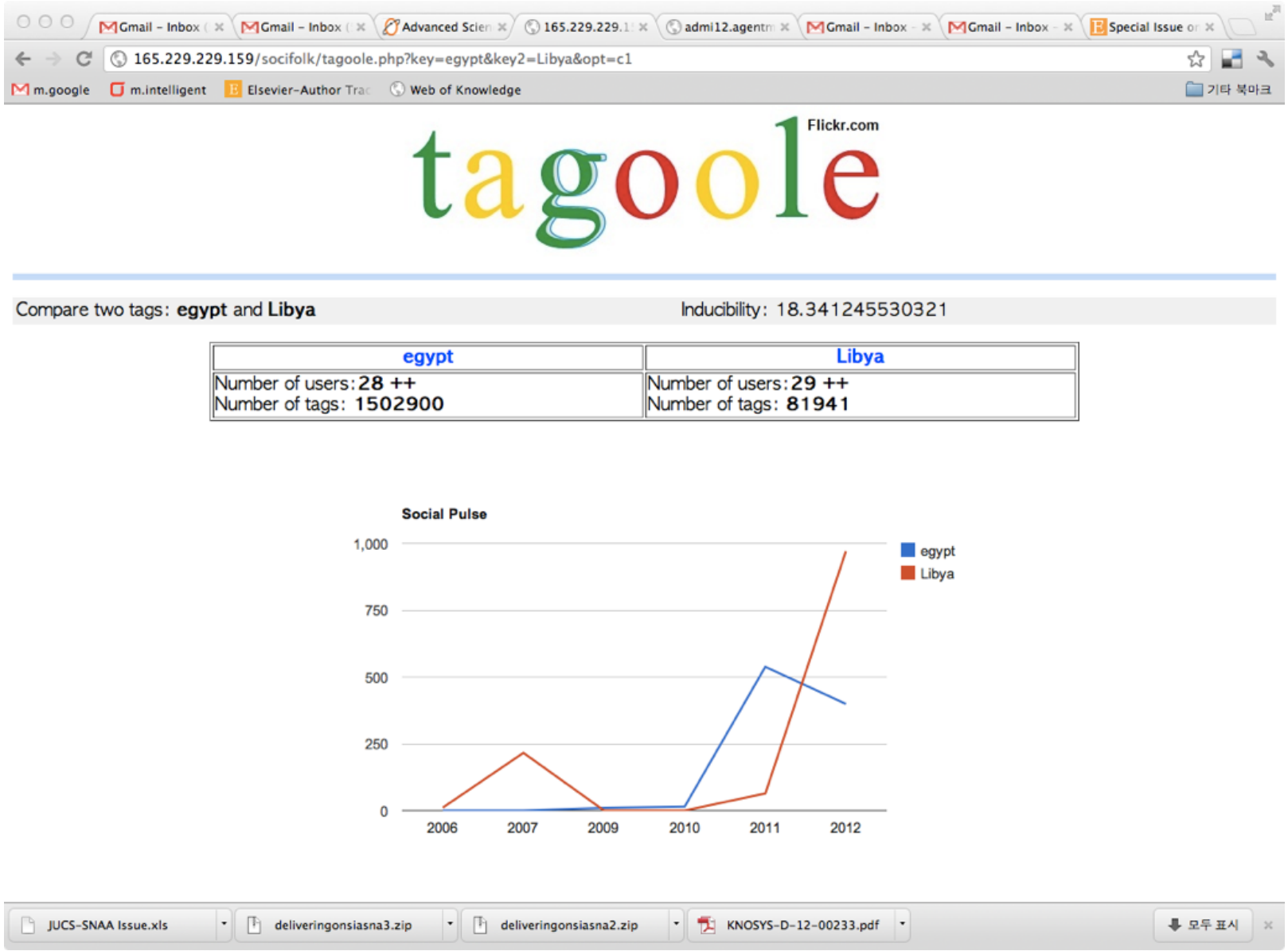
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Compare two tags: egypt and Libya
Inducibility: 18.341245530321
egypt
Number of users: 28 ++
Number of tags: 1502900
Libya
Number of users: 29 ++
Number of tags: 81941
Social Pulse
1,000
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2006
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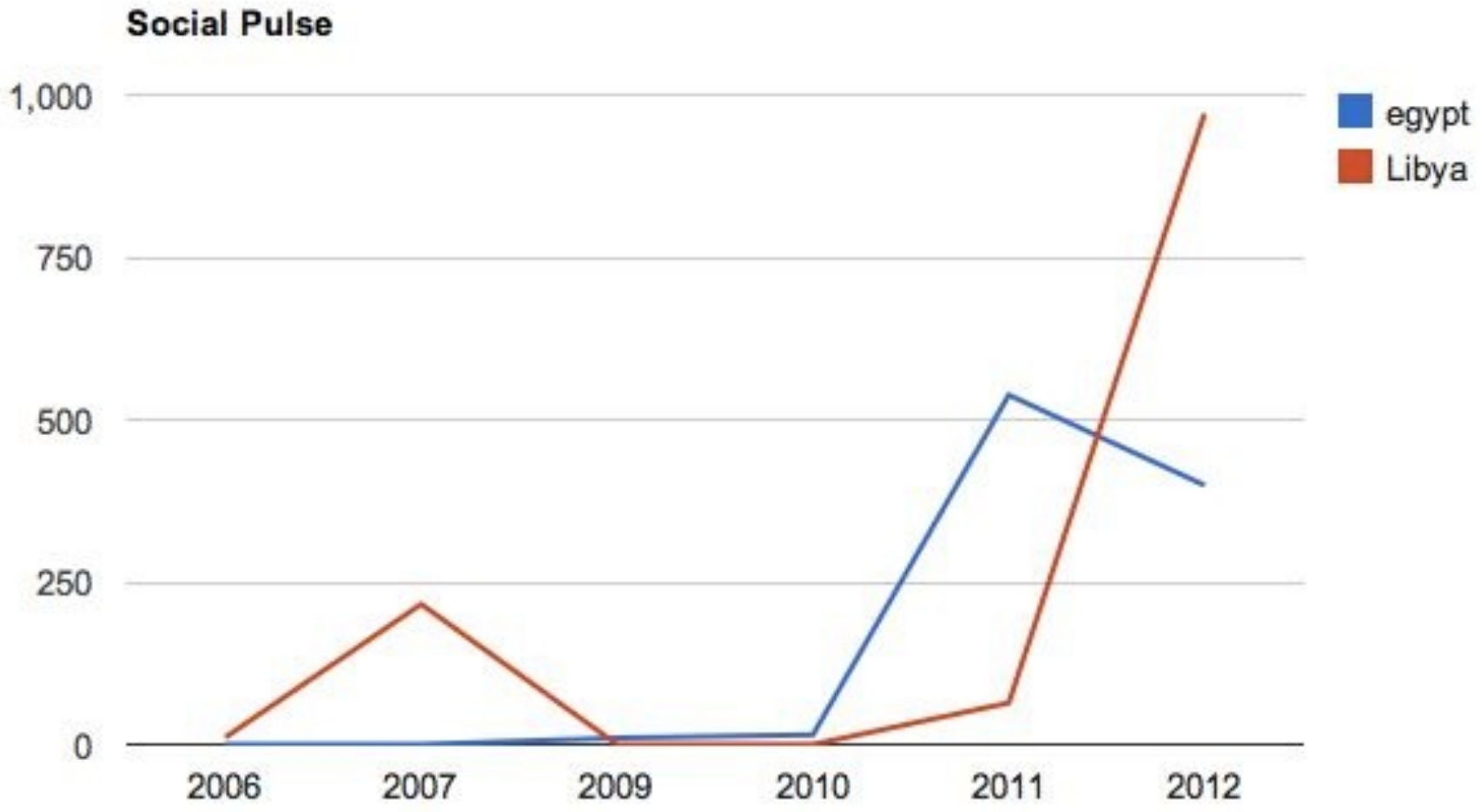
모두 표시

Arab Spring


Social Pulse
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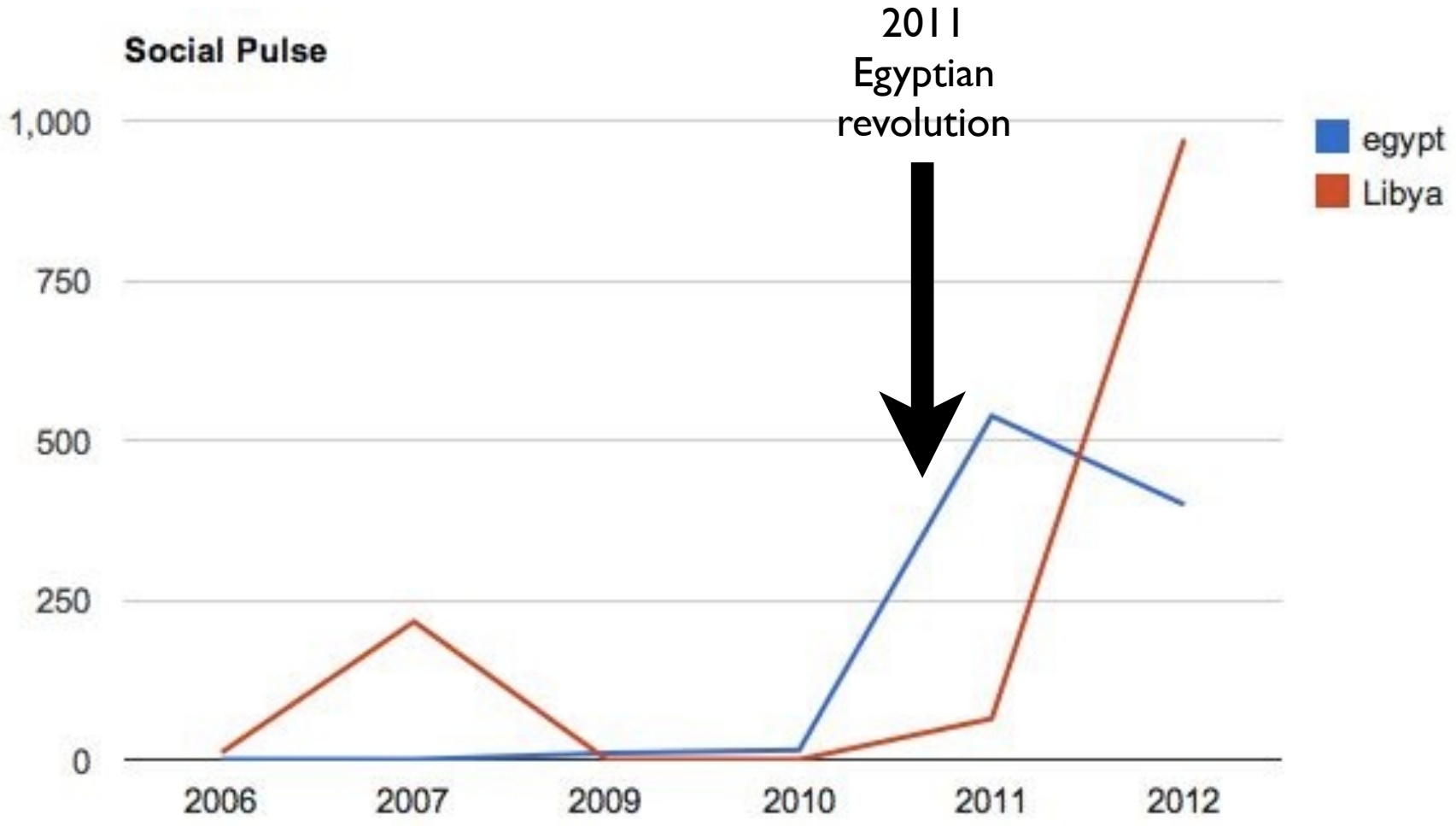
750
500
250
0
2006
2007
2009
2010
2011
2012
egypt
Libya

Arab Spring


Social Pulse
2011
Egyptian
revolution
egypt
Libya
1,000
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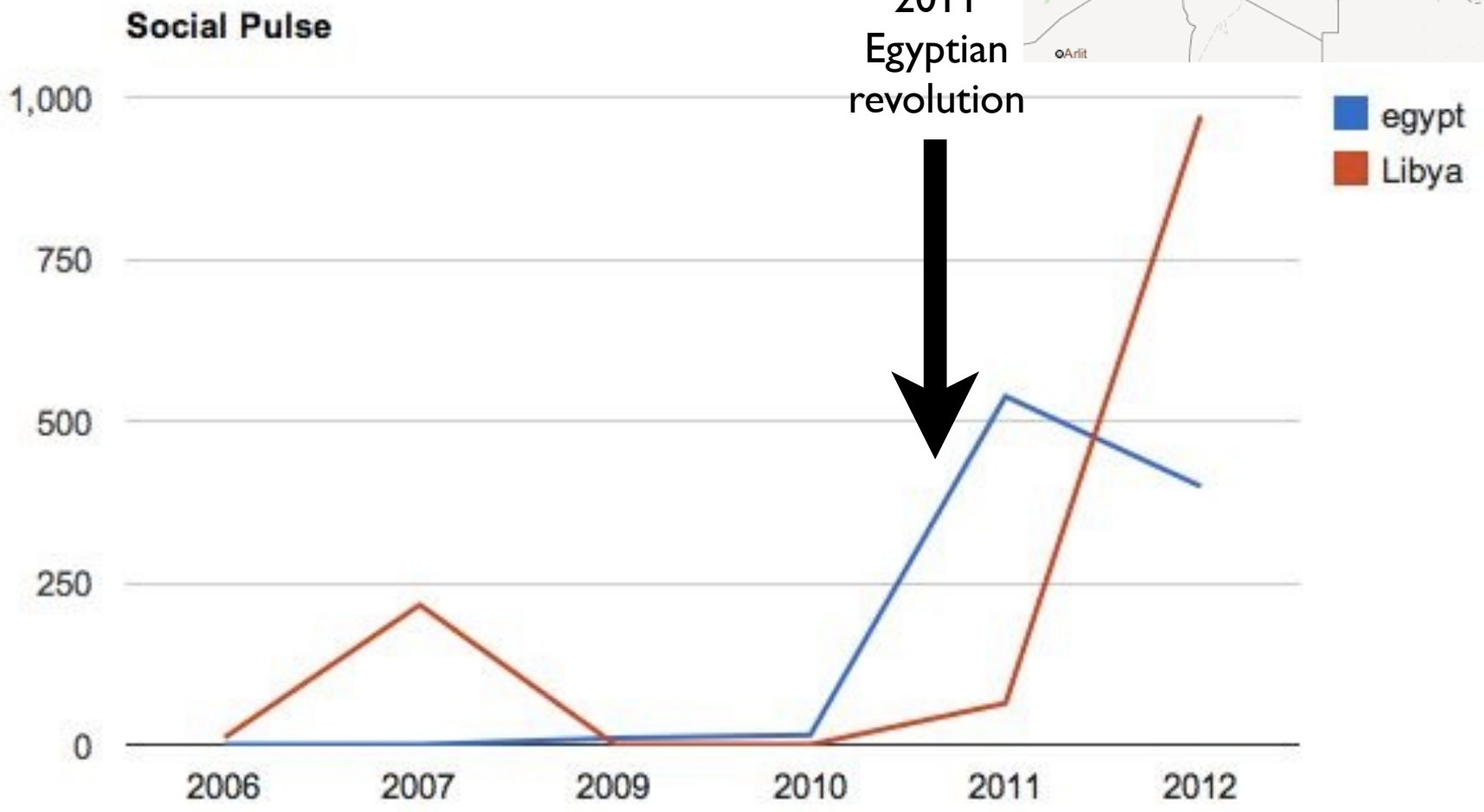
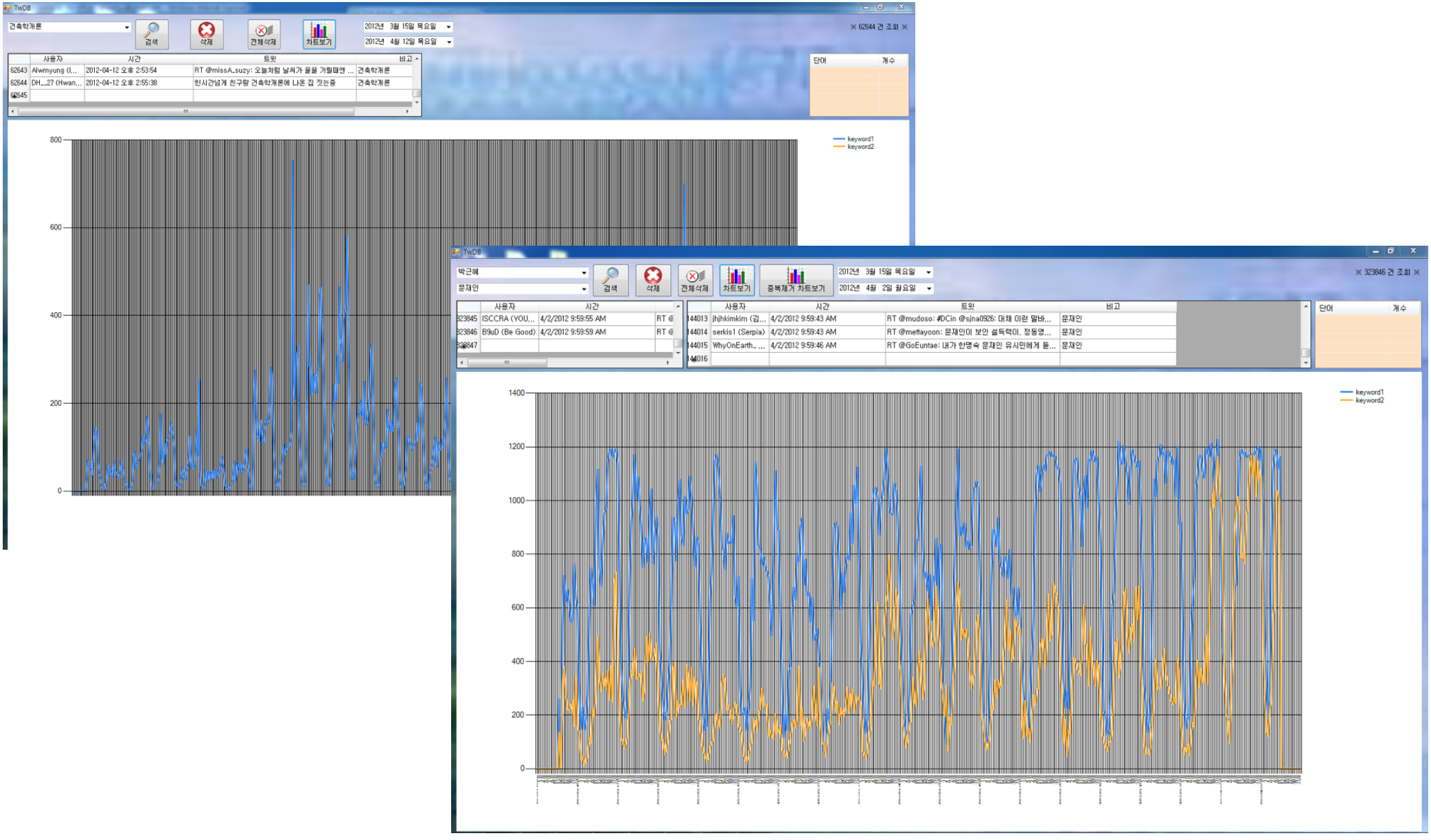
2006
2007
2009
2010
2011
2012

Arab Spring

2011
Egyptian
revolution



TweetPulse


TwDB
검색
삭제
전체삭제
차트보기
keyword1
keyword2
800
600
400
200
0
1400
1200
1000
800
600
400
200
0

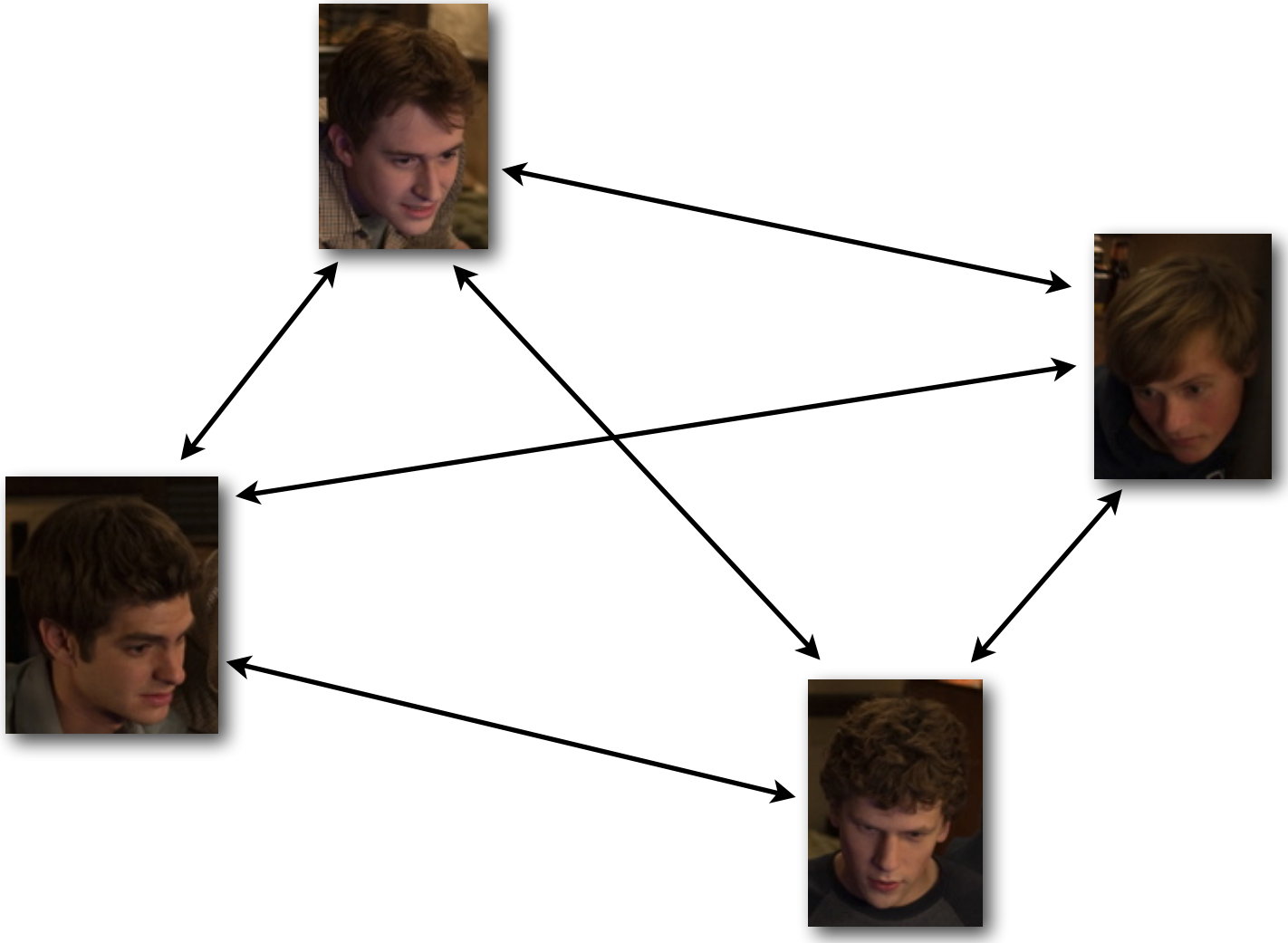
Agenda

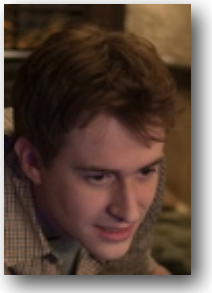
- Contextual Synchronization
- **Social contextualization**
- Social media communication
- Examples
- Conclusion

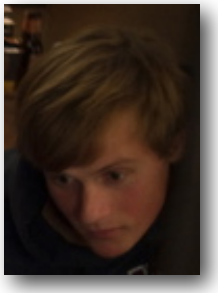
Context-aware services

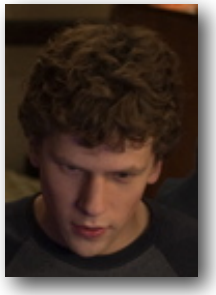
- Location
- Time
- Any other context?

Social networks (2010)

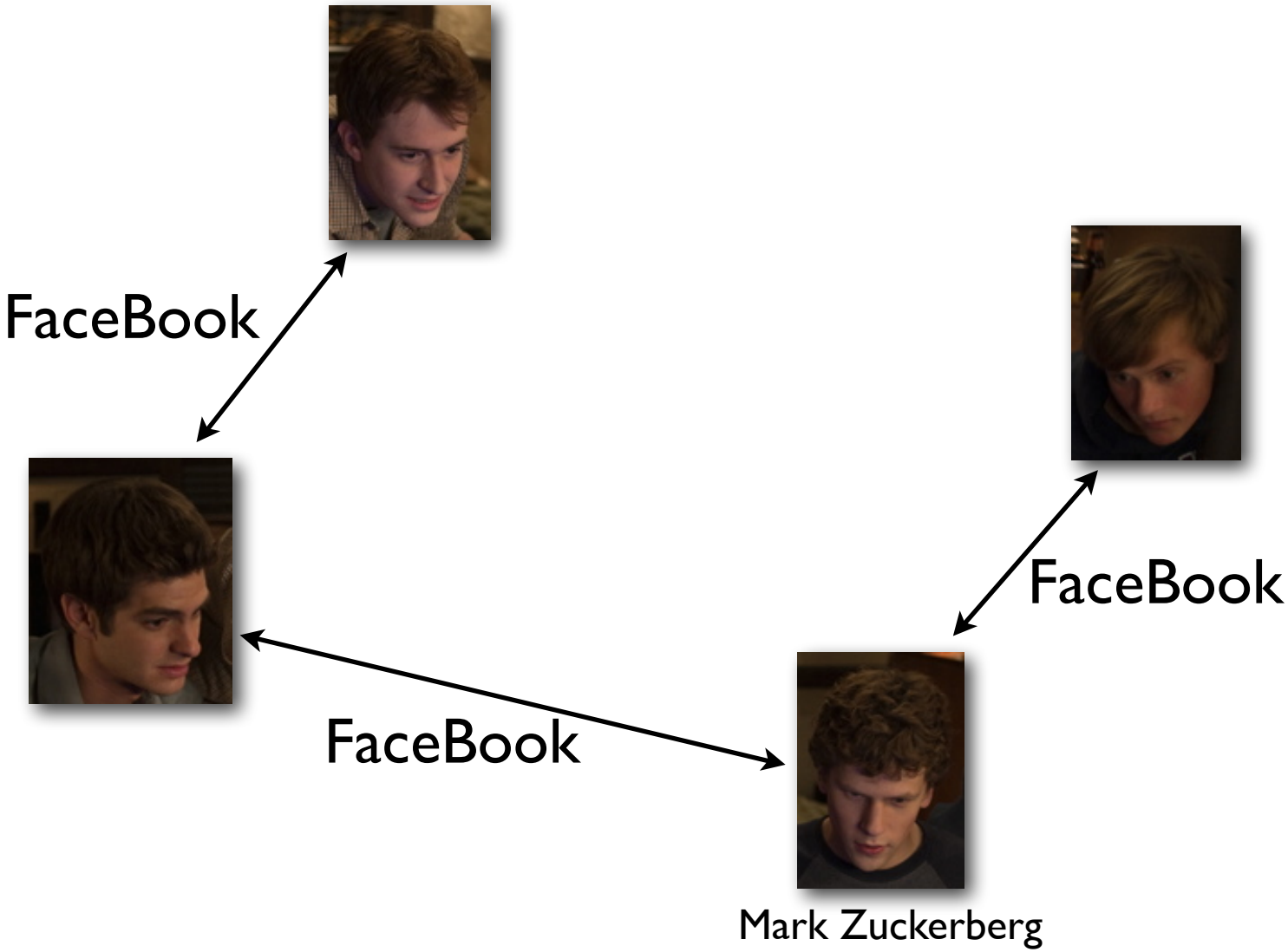

Mark Zuckerberg

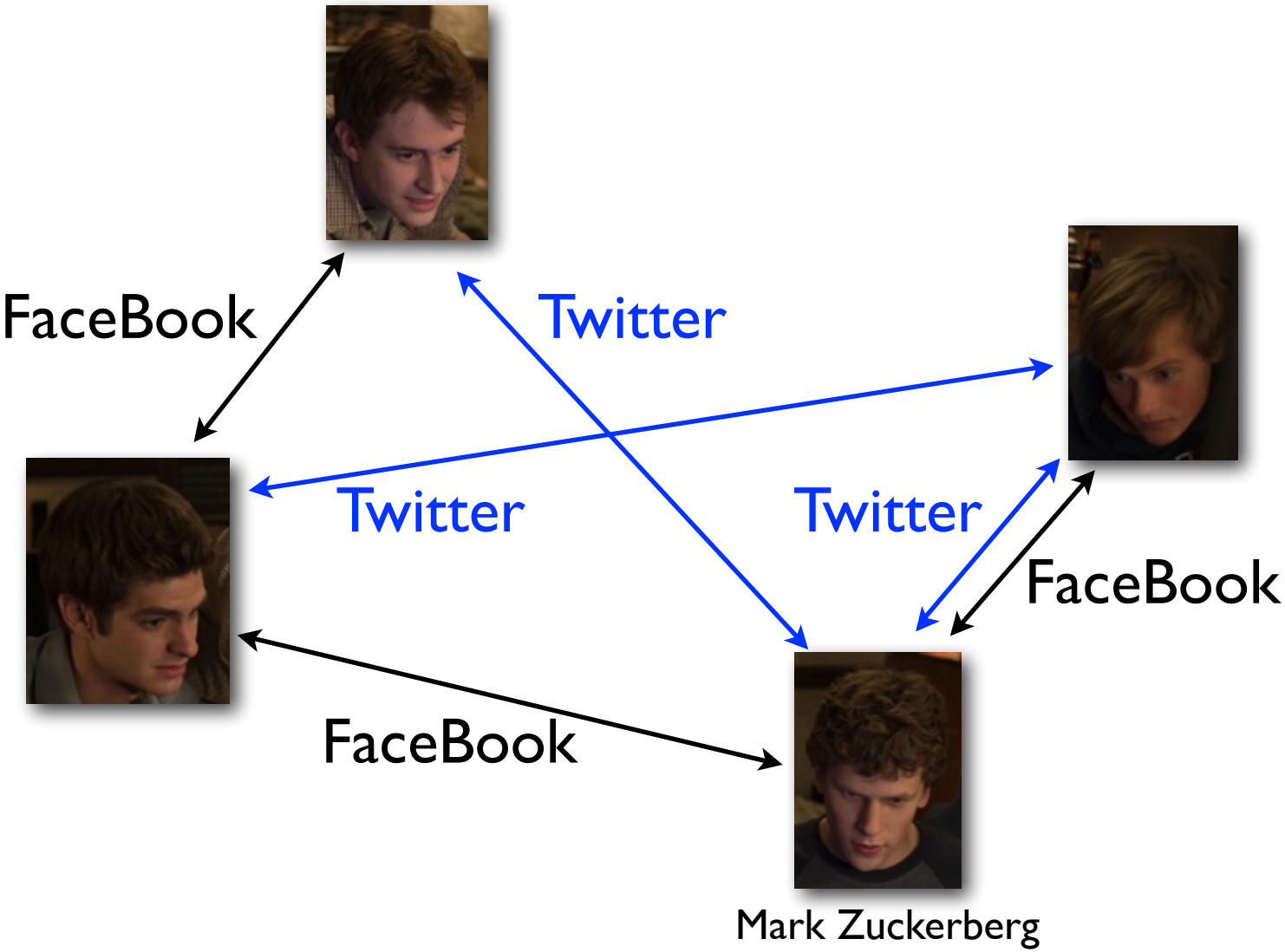






Mark Zuckerberg


FaceBook
FaceBook
FaceBook
Mark Zuckerberg


FaceBook
Twitter
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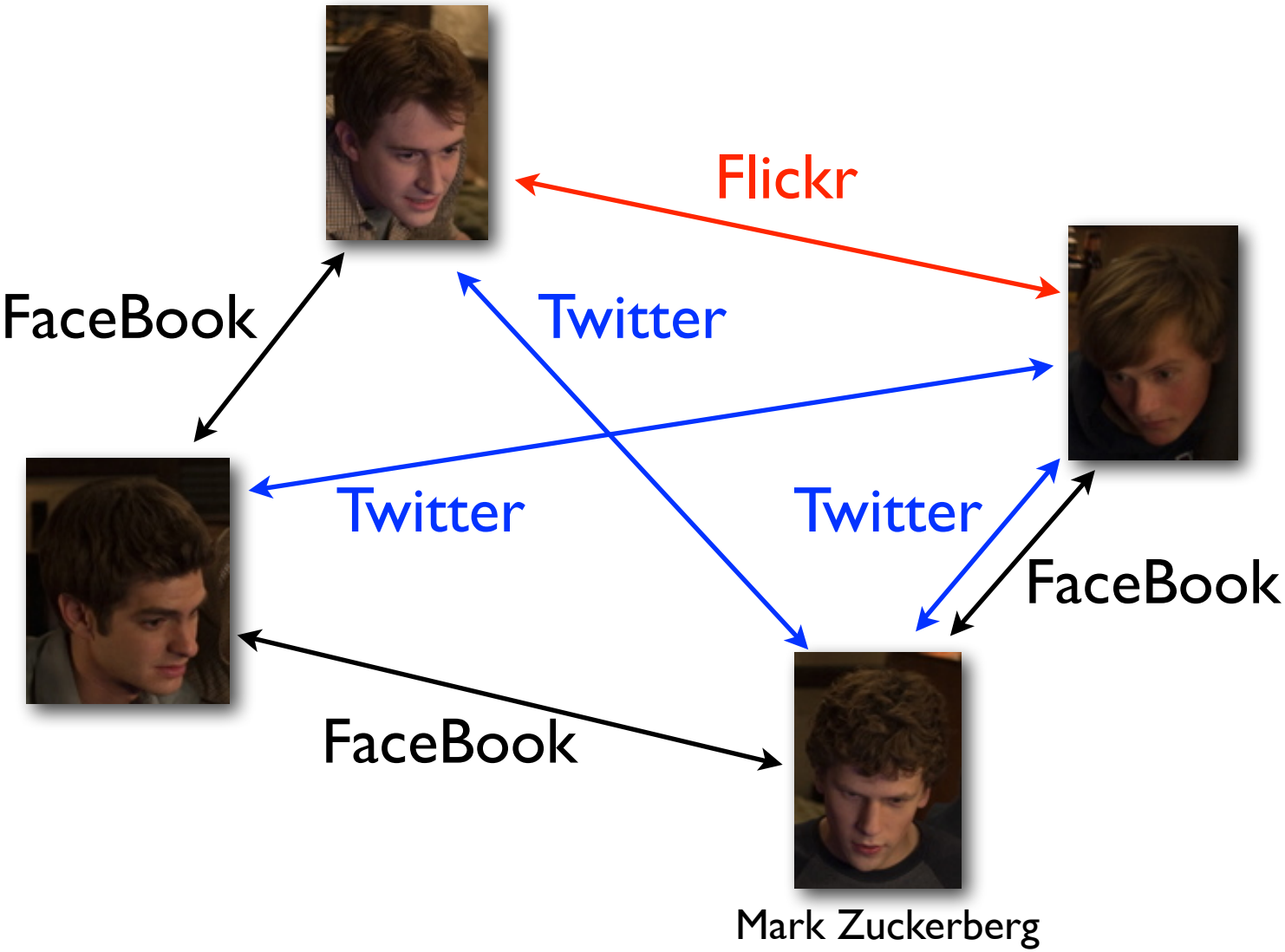
FaceBook
Mark Zuckerberg


Flickr
FaceBook
Twitter
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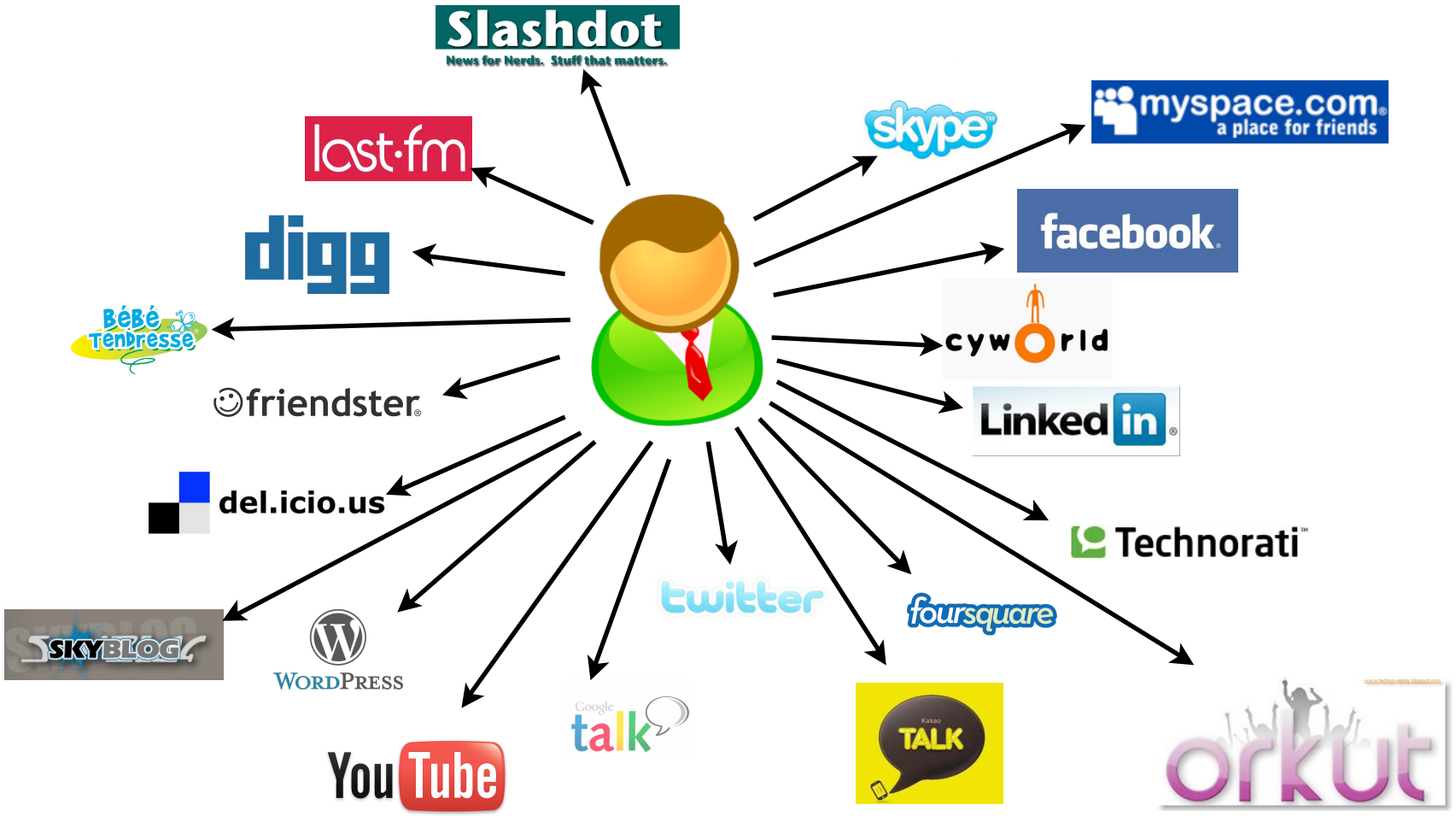
FaceBook
Mark Zuckerberg

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



Ego-centric Social Network (e-SN)

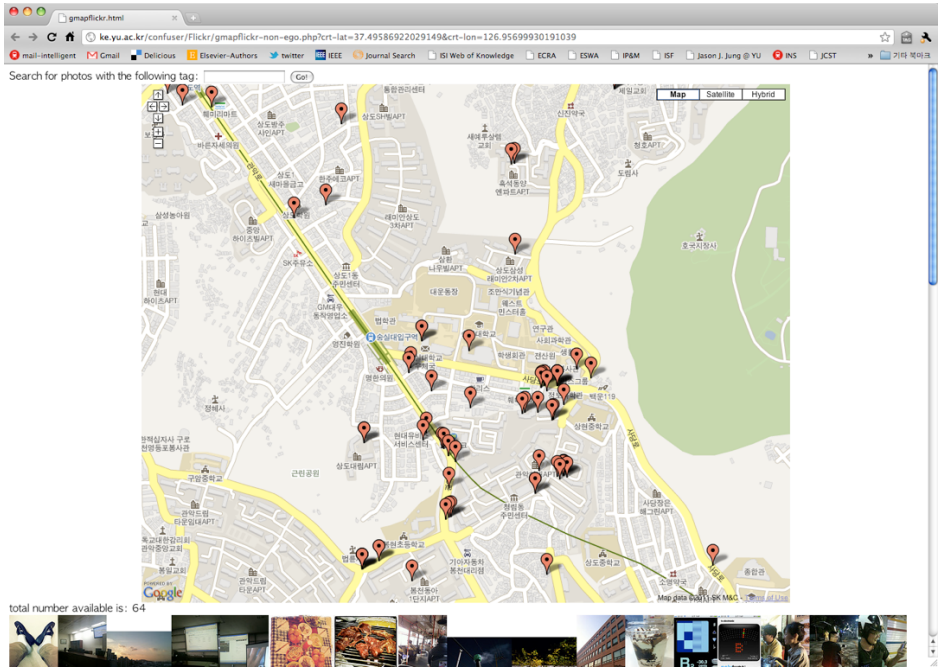
- Social networks are distributed in many different applications, e.g., Facebook and Twitter.
- Thus, the partial social networks have to be integrated to build an ego-centric social network.

Why e-SN?

- Personalized filtering

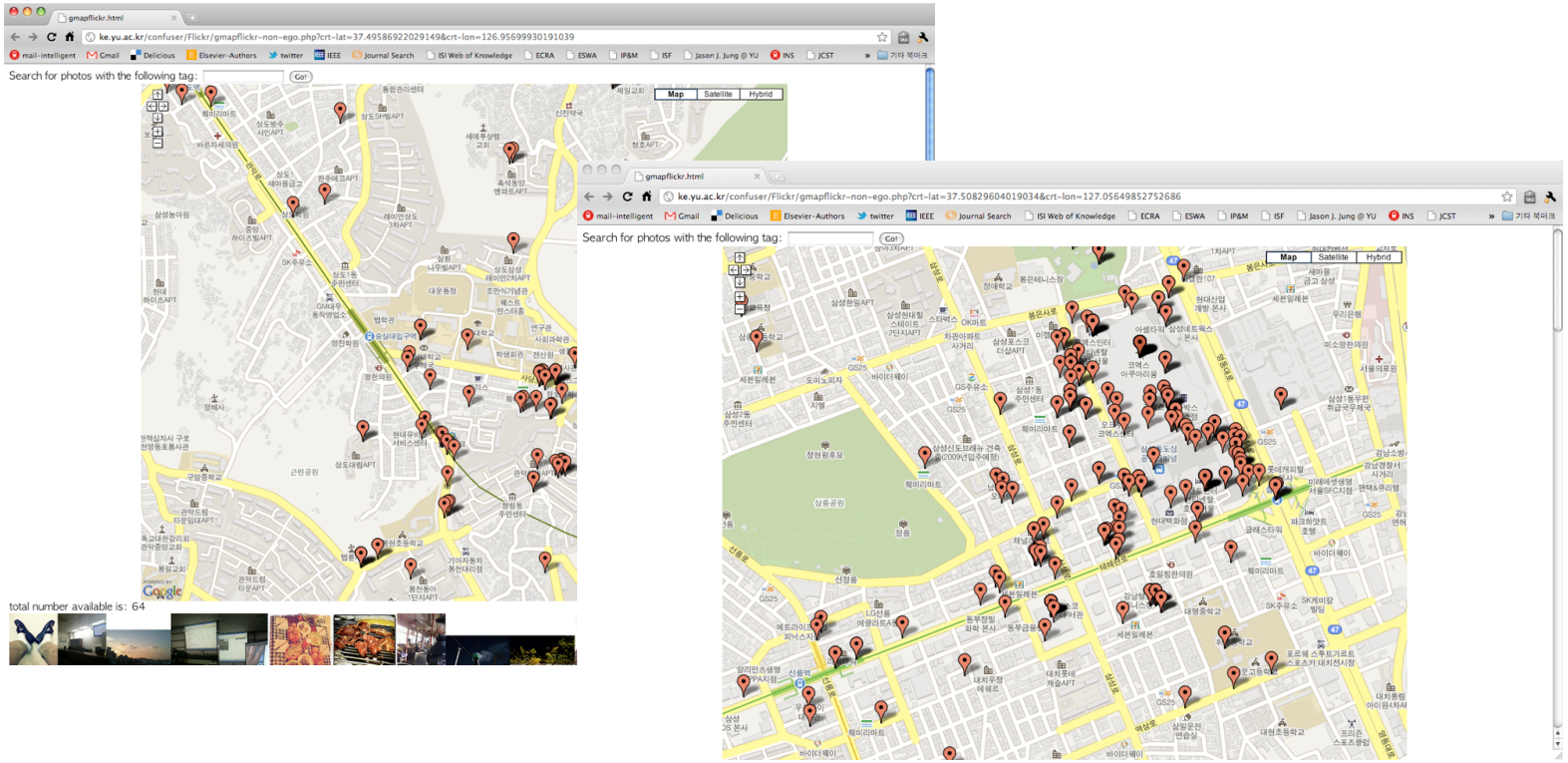
Why e-SN?

- Personalized filtering



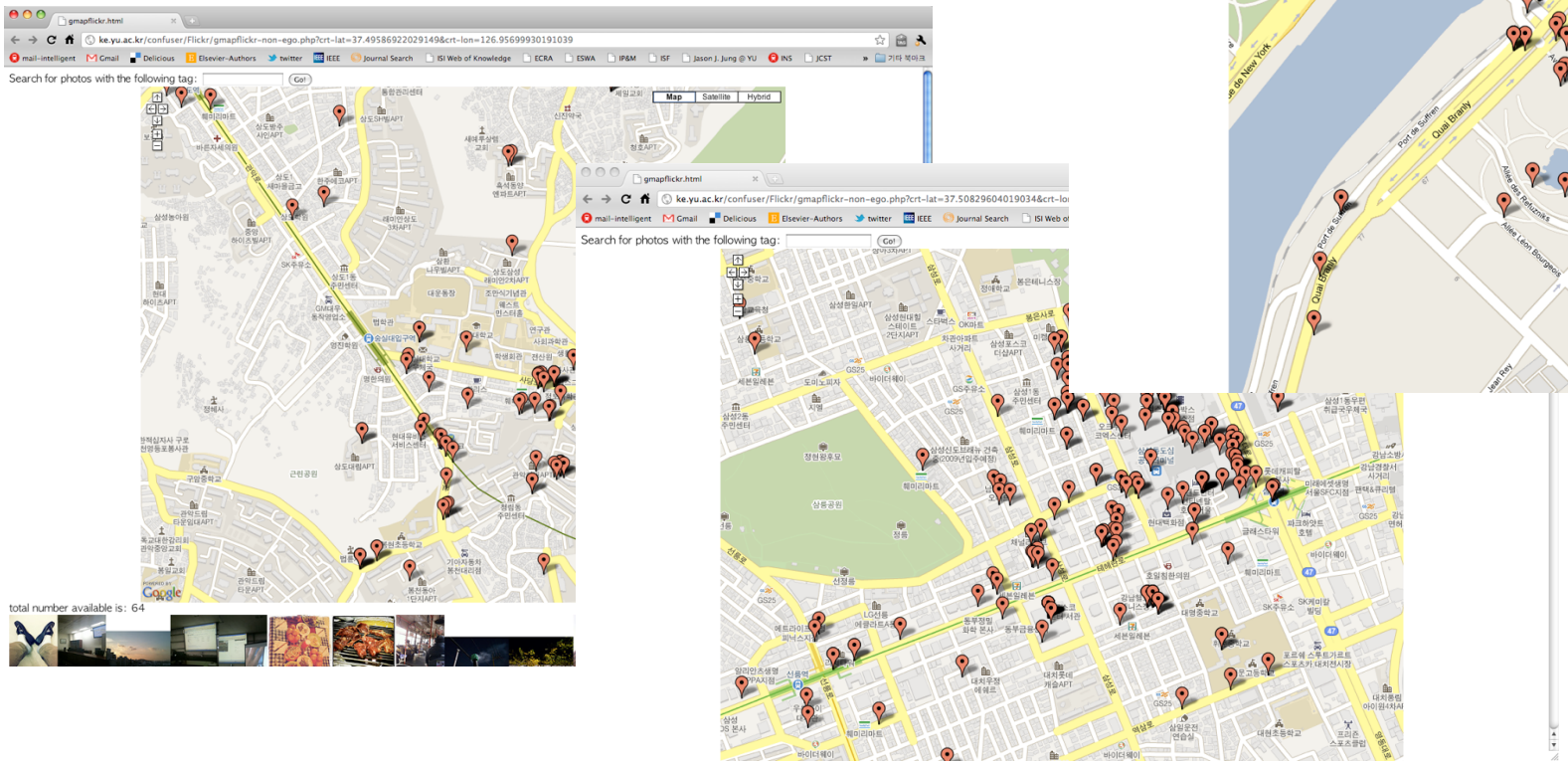
Why e-SN?

- Personalized filtering

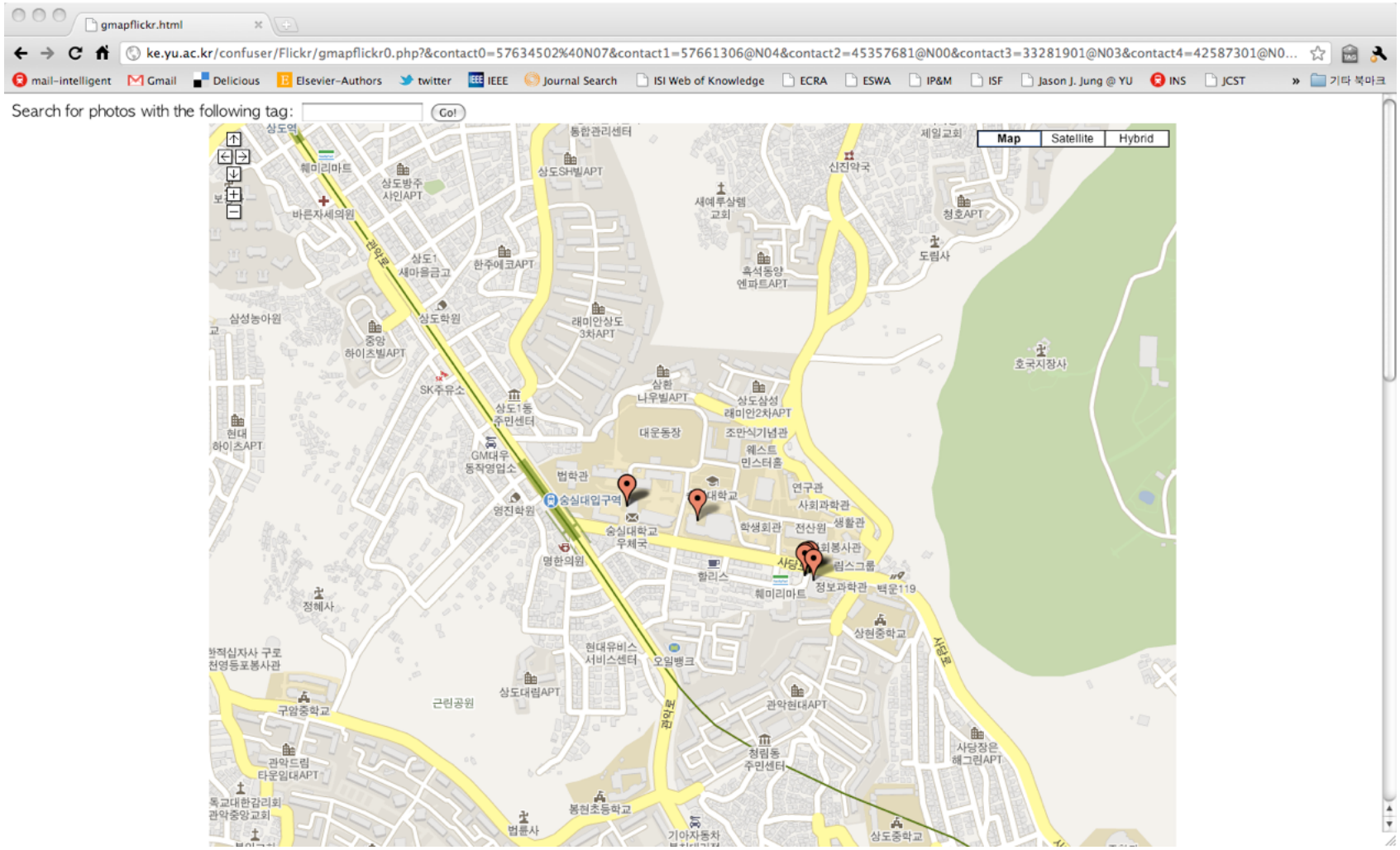


Why e-SN?

- 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

skype

My wife's favorite movies

facebook

cyworld

LinkedIn

Recommendation

twitter

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

foursquare

Restaurants and Cafes
near Current location

Reality mining for TelCon

- Building a social network by mobile phone usage patterns
  - How ofter (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

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

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

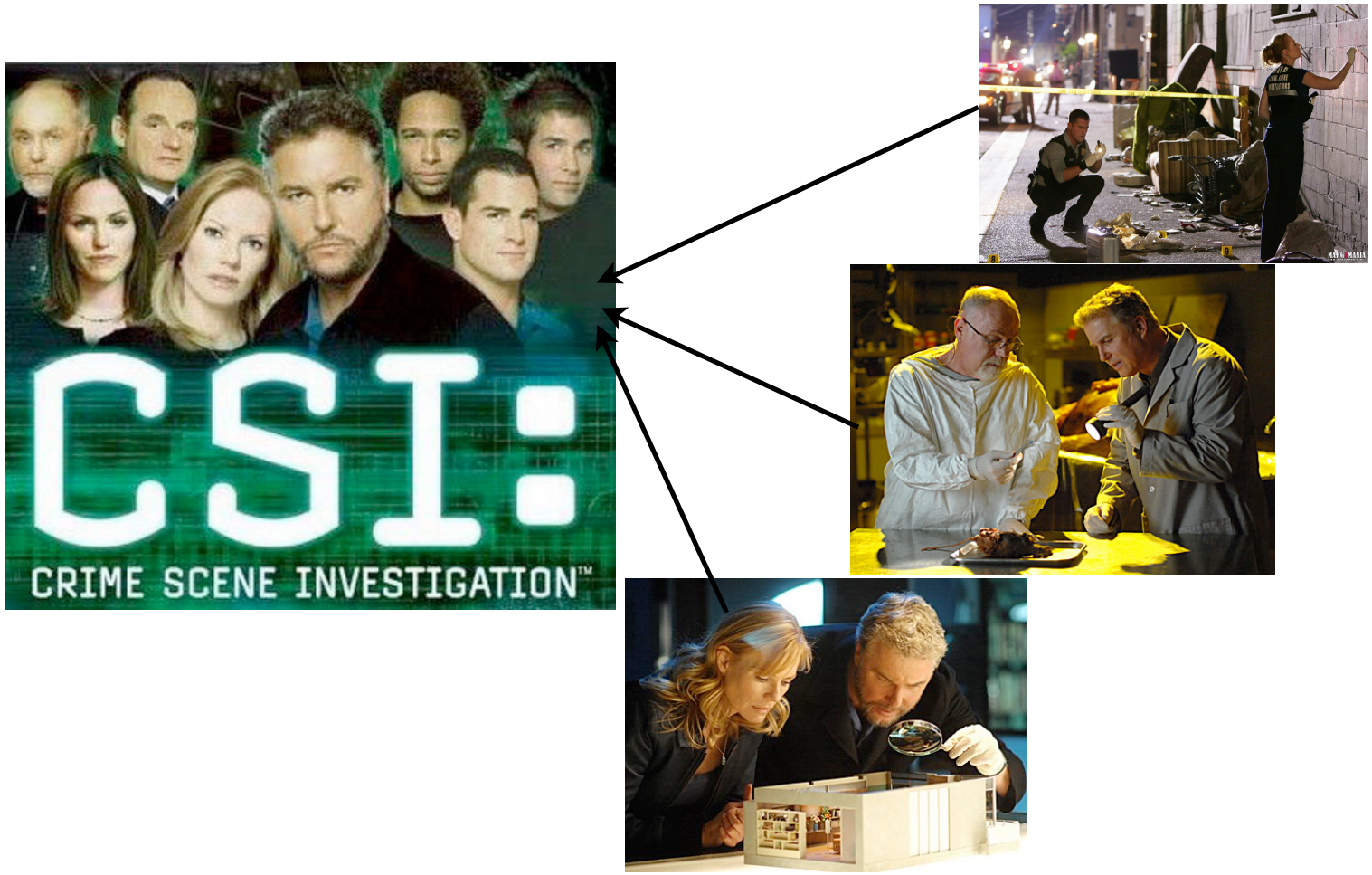
Task characteristics

- Urgency (e.g., "Find the answer right now")
- Complexity (e.g., "Explain what is the capital of Spain" 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
- Weight(email) > Weight(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
Catherine Willows
CSI Asst. Night-Shift
Supervisor
Nick Stokes
CSI Level 3
Hair and fiber analysis
Greg Sanders
CSI Level 2

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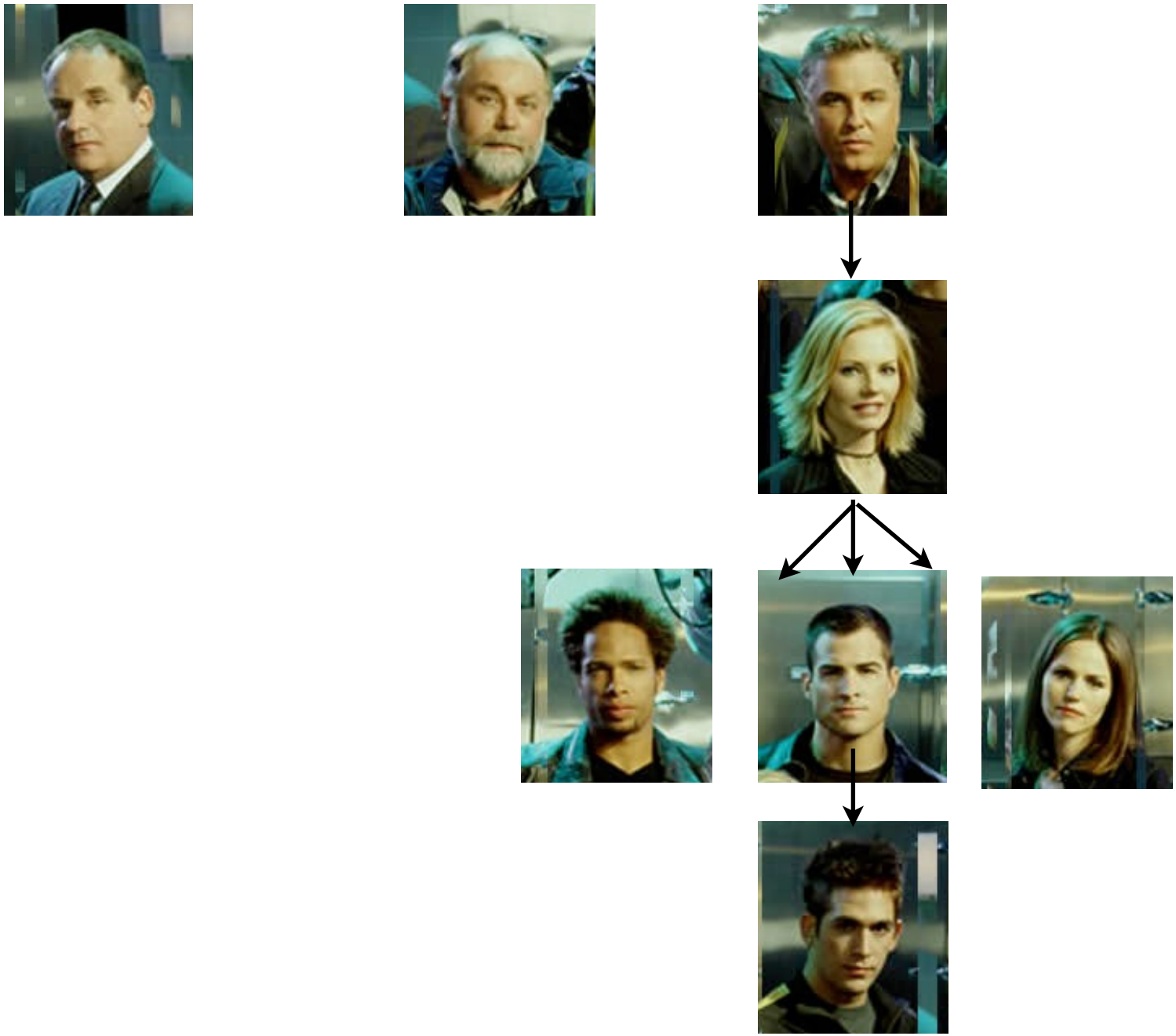

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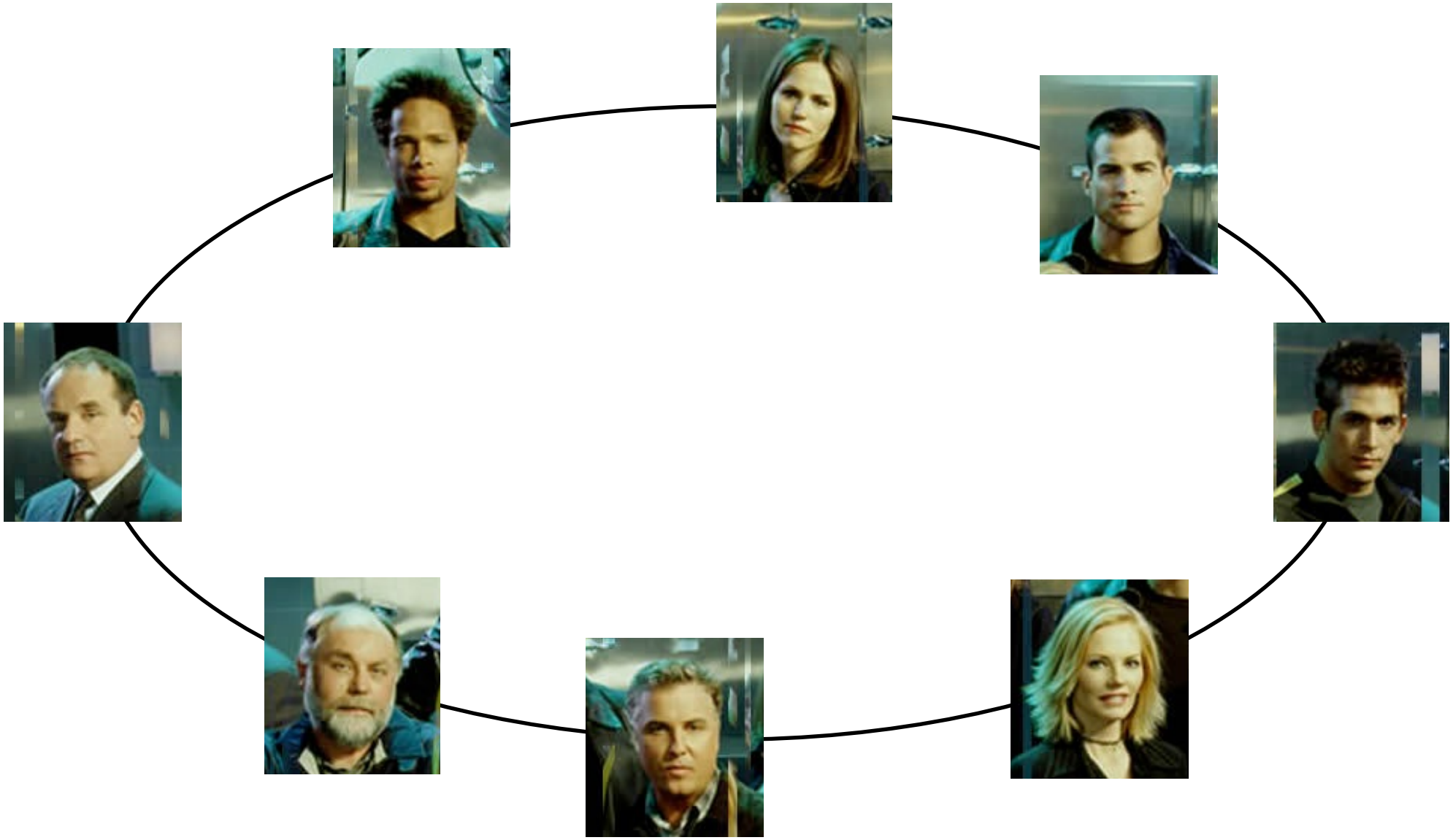

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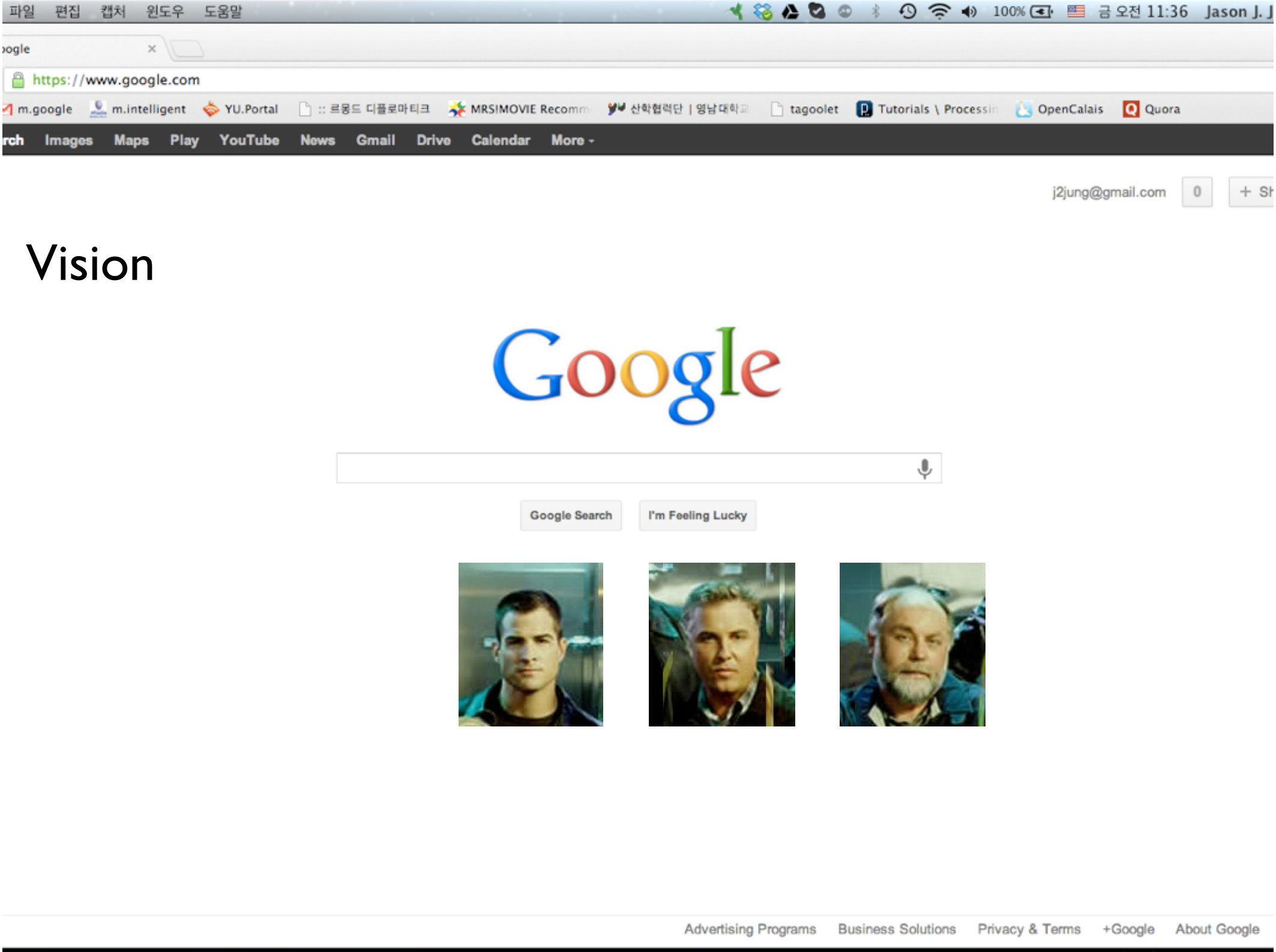
MARGMANIA

Vision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Vision

Cross-media Communication

Ask @Gil and @Robbin who the murderer is.

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Wrap-up

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

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- National Research Foundation (NRF) in Korea
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CFP

- Special Issue on Information Fusion
  - "Social Big Data" (http://www.journals.elsevier.com/information-fusion/call-for-papers/the-context-of-social-big-data/)
- International Conference on Computational Collective Intelligence 2014 at Jeju Island, Korea
- International Conference on Information Scalability 2014 (InfoScale 2014) at Seoul, Korea