

Data for the People, by the People

Mor Naaman
Rutgers SCILS

Flashback: 2007

Discuss:

The Semantic Web is Dead

Welcome to the
Emerging-Semantics Web!

YAHOO!

Mor Naaman - Yahoo Research Berkeley

14



A Semantic Web (could be) Alive!



flickr®

<http://flickr.com/photos/cenz/16128560/>

Academics on Flickr

More crazy people

ADD NOTE SEND TO GROUP ADD TO SET BLOG THIS ALL SIZES ORDER PRINTS ROTATE DELETE X



At the banquet. Wine was flowing, and food was not. This is the result.

Tags

- Michael Fleischman [x]
- Jurgen Scheible [x]
- Brian Bailey [x]
- ACM MM [x]
- ACM MM 2007 [x]
- ACM Multimedia 2007 [x]
- Banquet [x]
- Germany [x]
- zonetag [x]
- cameraphone [x]
- Augsburg [x]
- zip:86199 [x]
- geotagged [x]
- celltagged [x]

Guess the Tags

Zion

Hiking

Mountains

Landscape

Nature

Valley

 <http://flickr.com/photos/oneeighteen/1610814928/>

Guess the Tags

Dog

Puppy

White

Animal

Pet

Sad

Cute

Nepal


flickr


<http://flickr.com/photos/klash/858533852/>

6

Flickr Tag Affordances

Beautiful fog over the Bay Bridge...





Uploaded on July 13, 2006
by [Tom Coates](#)

+ [Tom Coates' photostream](#)

This photo also belongs to:

+ [Some of my favourite pictures \(Set\)](#)

Tags

- Bay Bridge
- zonetag
- cameraphone
- San Francisco
- California
- zip:94105
- USA
- celltagged
- cell:network=Cingu
- cell:mcc=310
- cell:mnc=380
- cell:lac=6023
- cell:cellid=5671
- fog

So, Why We Tag?

- 13 ZoneTag users (23-45, 9m, 4f)
- All “taggers”
- Semi-Structured interviews

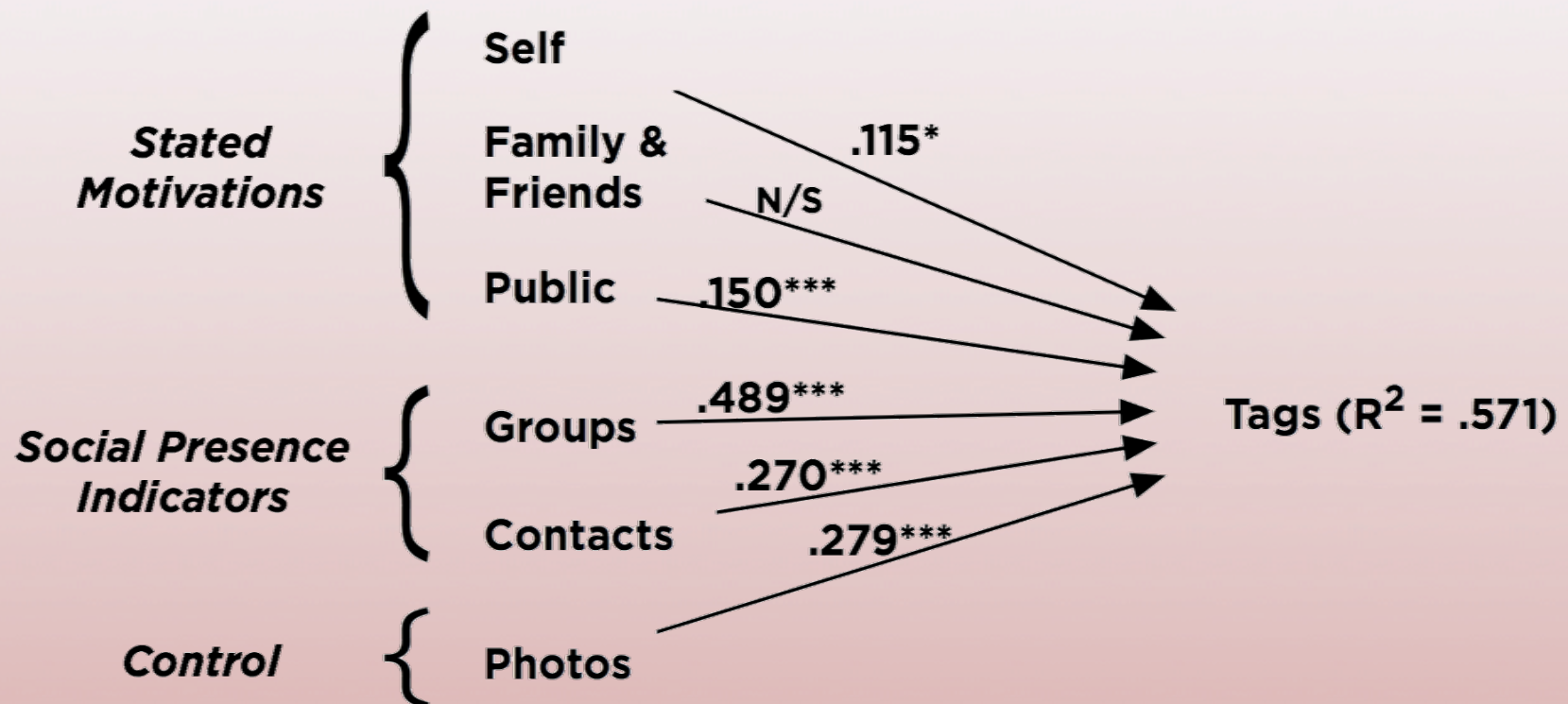


A whole bunch of reasons!

		<i>Function</i>	
		Organization	Communication
<i>Sociality</i> Social	Self	* Retrieval, Directory * Search	

Also by the Numbers

- Motivations operationalized into survey, shown correlation with number of tags



Why *Not* Tag (other's photos)?

- 99% of the tags on Flickr are added by the photo owner

Not Collected

Not Identified

Not prominent

Not aggregated

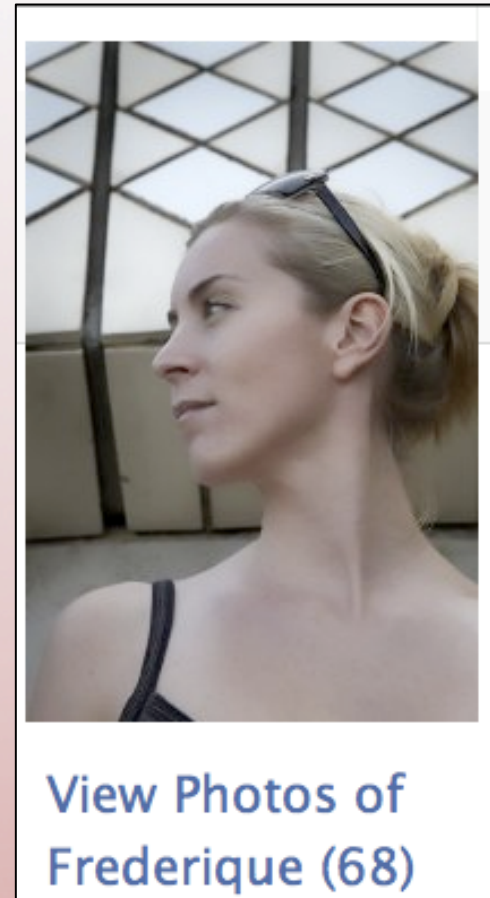
Tagging Systems are not Created Equal

- Source and type of object
- Tagging rights
- Tagging support/suggestions
- Aggregation (set/bag)?
- Display/functionality



Is Facebook Different?

- Yes!
- Social constructs encourage (“semantic”) people tagging
- No other tags to speak of



Tagging, communities, vocabulary, evolution (*toread*)

- Sen et al., CSCW 2006

Movie Tags [\(more about tags\)](#)

Add and edit tags here

My Tags [\[edit\]](#)

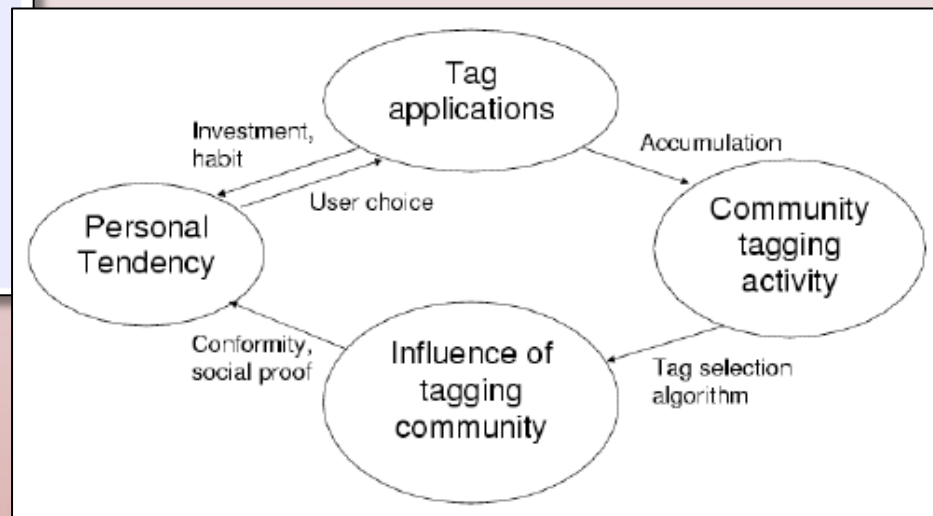
- [phone booth](#)
- [dark](#)
- [carrie-anne moss in tight latex pants](#)
- [power of myth](#)
- [sufficiently explodey to be good](#)

[\[add new tags\]](#)

Popular tags:

Click on this icon (+) to add a tag to your list!

- [+ Great heroics \(1\)](#)
- [+ smart \(1\)](#)
- [+ lots of kicking \(1\)](#)
- [+ Brilliant \(1\)](#)
- [+ Pure action \(1\)](#)



Sen et al. Controlled Tagging Experiment

- Treatments:
 - Private tags
 - Shared tags (various treatments)

Tag Group	Subjective	Factual	Personal
Unshared	24%	38%	39%
Shared	9%	82%	9%

SSS Factors in Social Media

- Self
 - Psychological, cognitive, motivational
- Social
 - Social psychology, social network, communication, interaction
- System
 - Application design, system affordances, functionality

A Social Media Science?

“research by Oded Nov of the Polytechnic Institute of New York University is beginning to ascertain why Wikipedians post entries and what motivates their activity; the psychological drivers that are revealed will help us understand how to encourage people to contribute to the Semantic Web.” TBL.



<http://flickr.com/photos/dooptheory/372807360/>

Where am I going with this?

- The motivations

- The data

- The multimedia

- A semantic web?

Where am I going with this?

- The motivations
- The data
 - Semantics from unstructured data
 - Tag Maps / World Explorer
- The multimedia
- A semantic web?

Throw Location into the Mix

More crazy people

ADD NOTE SEND TO GROUP ADD TO SET BLOG THIS ALL SIZES ORDER PRINTS ROTATE DELETE X



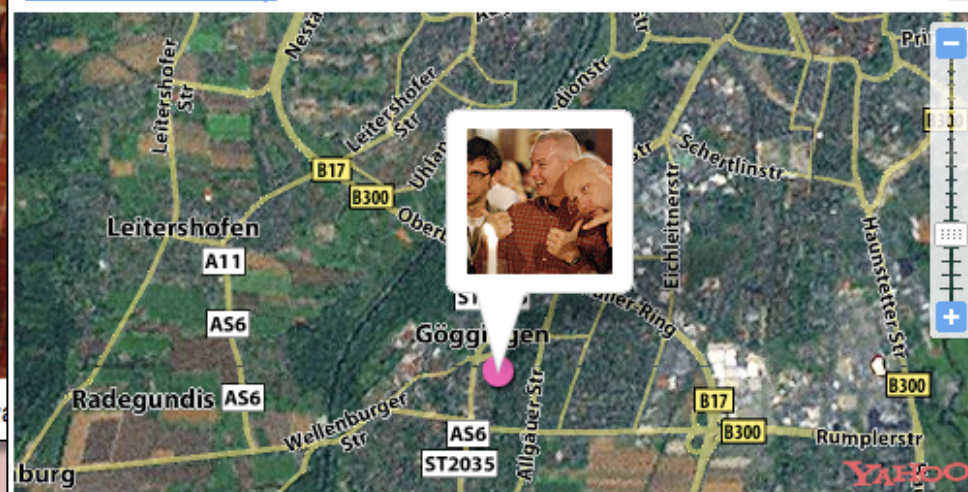
At the banquet. Wine was flowing, and food was

Tags

- Michael Fleischman [x]
- Jurgen Scheible [x]
- Brian Bailey [x]
- ACM MM [x]
- ACM MM 2007 [x]
- ACM Multimedia 2007 [x]

View Flickror's map

Close [x]

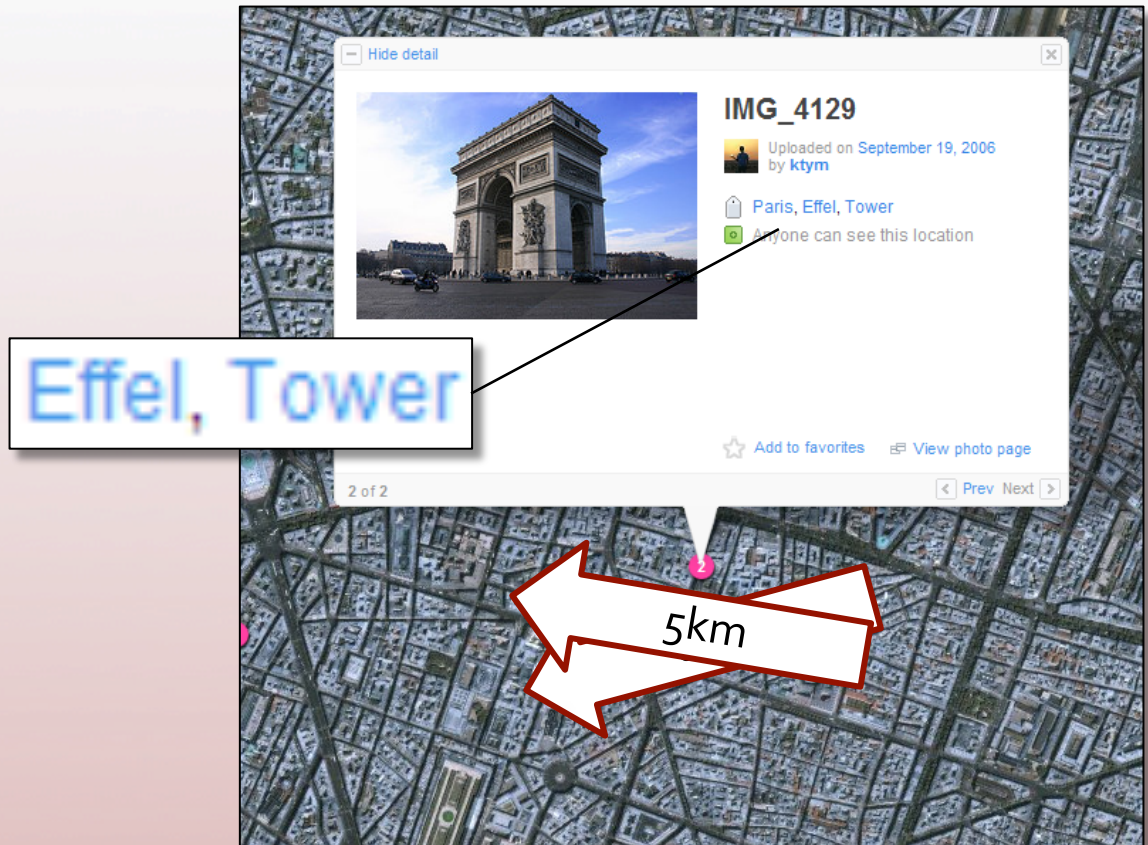


Taken in Augsburg, Bavaria (See [more photos here](#))

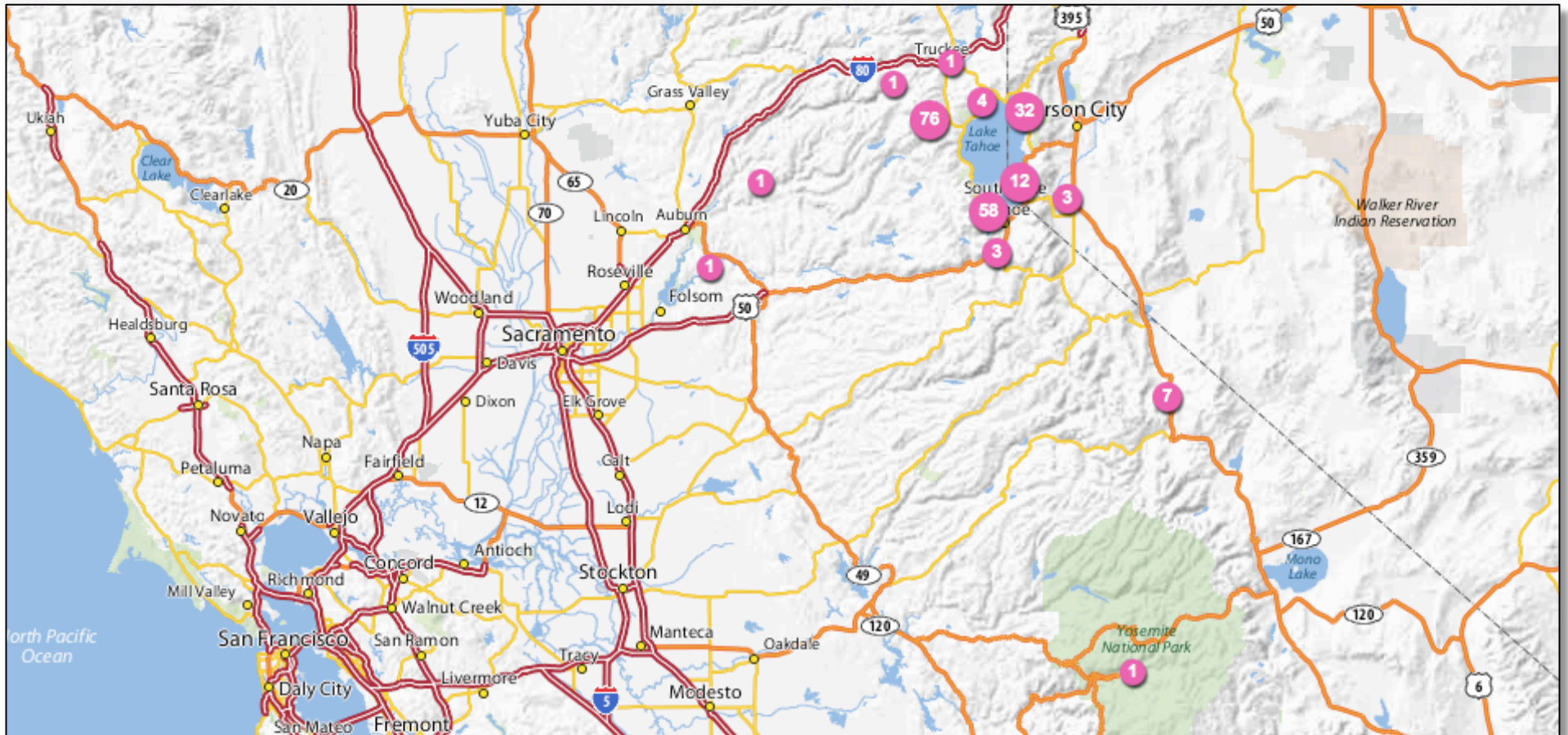
48°20' 28" N, 10°52' 15" E

This is not an Arch

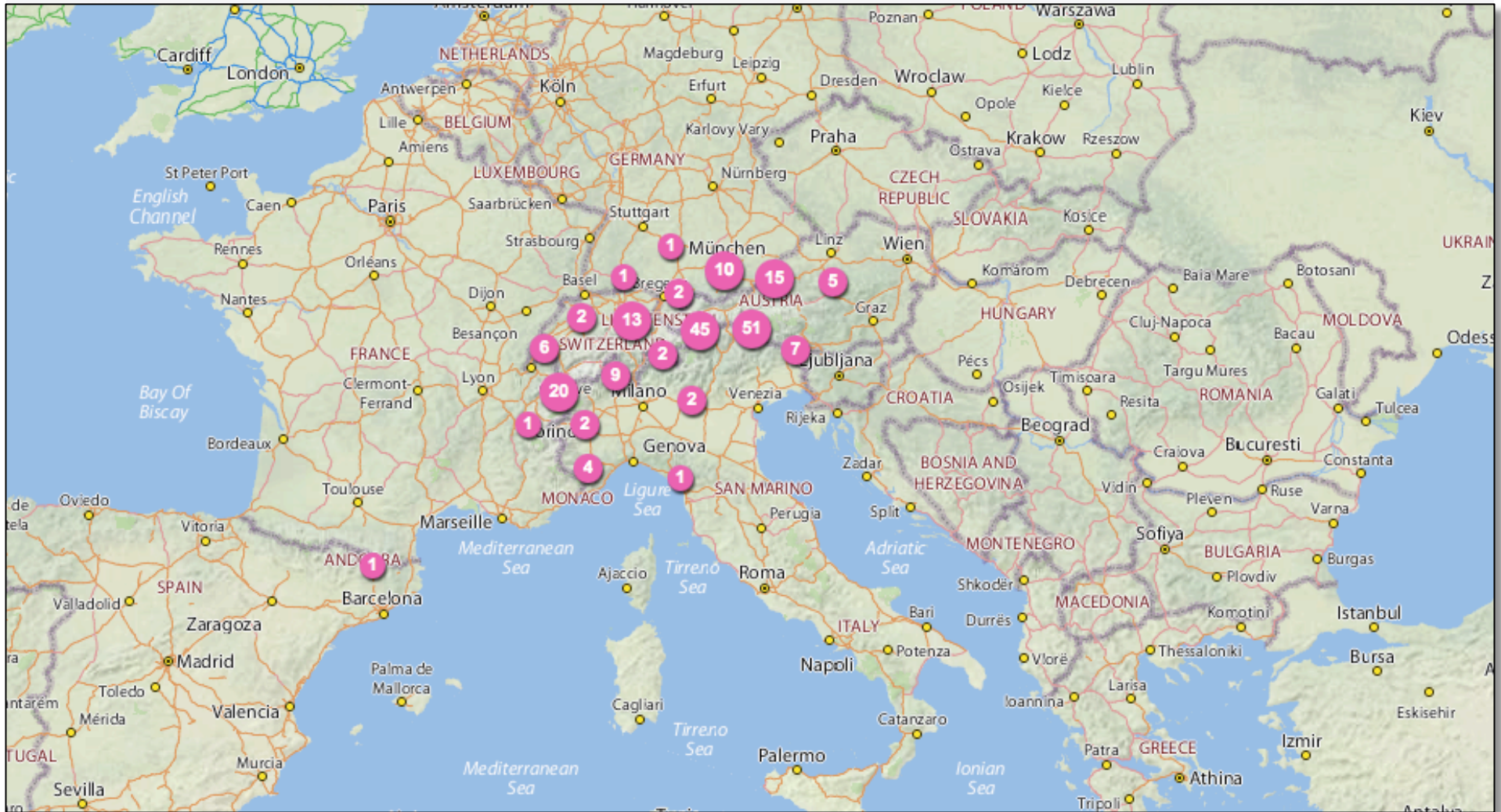
- Errors
- Noise
- Bias
- ...



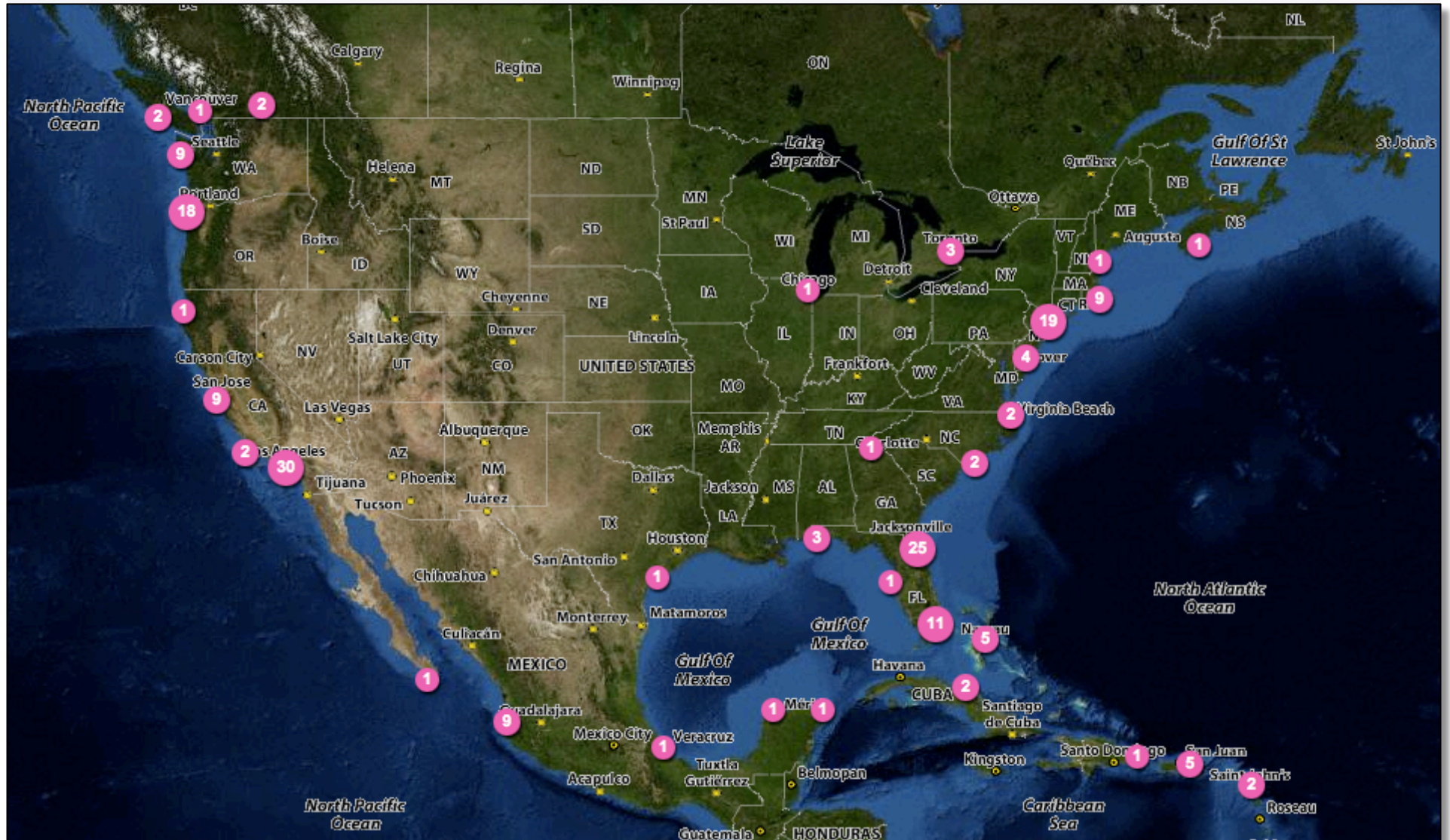
Tag Patterns



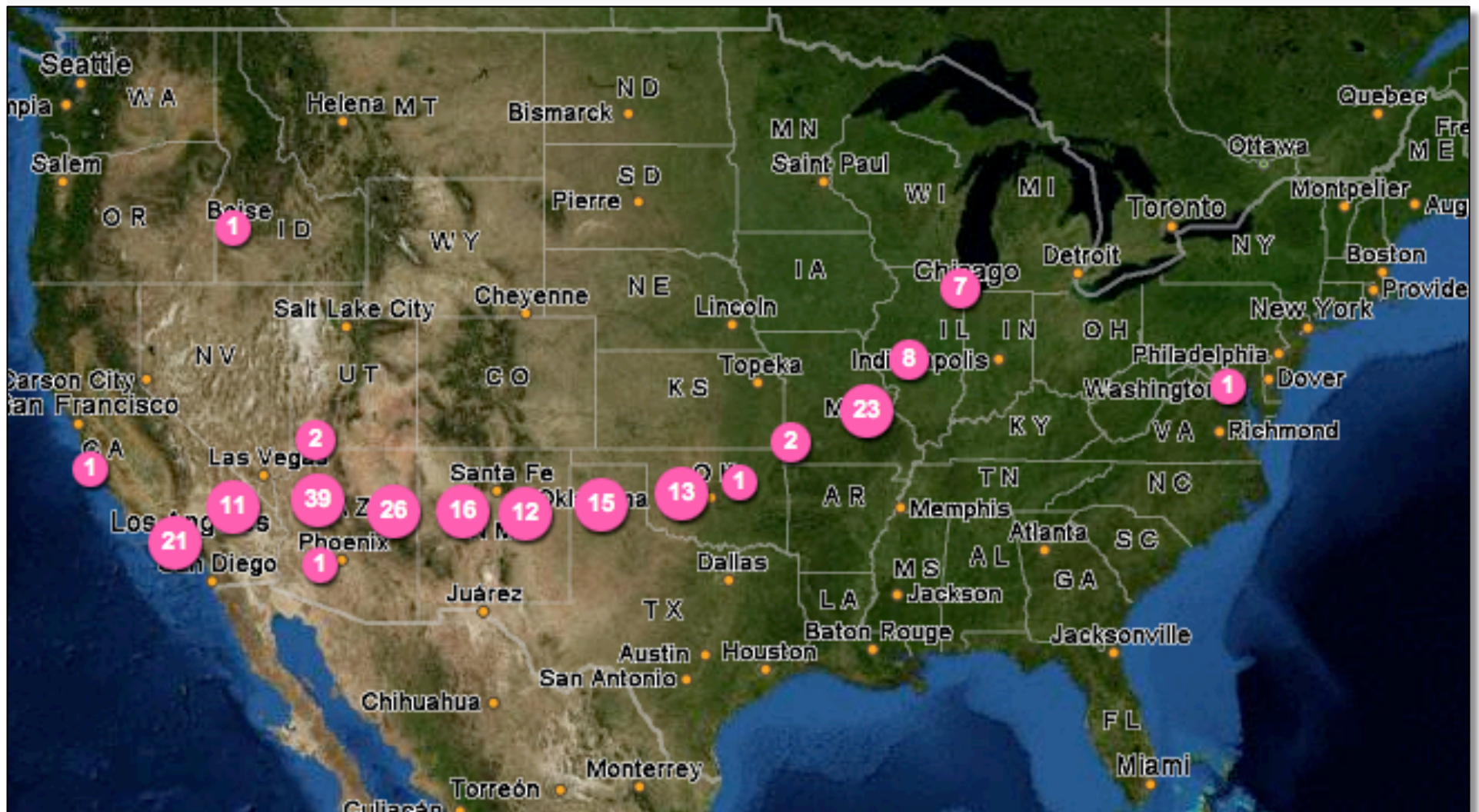
Tag Patterns



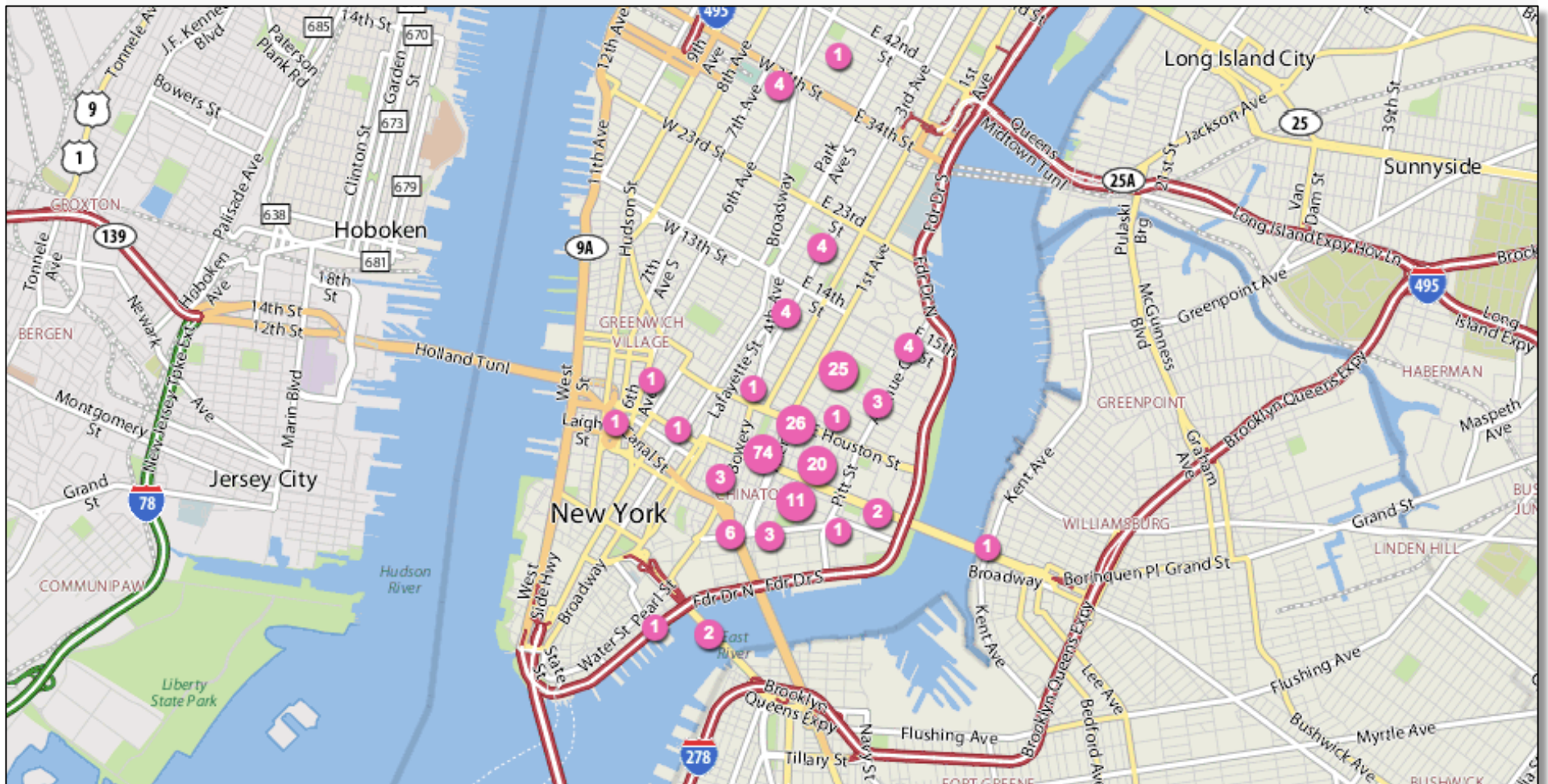
Tag Patterns



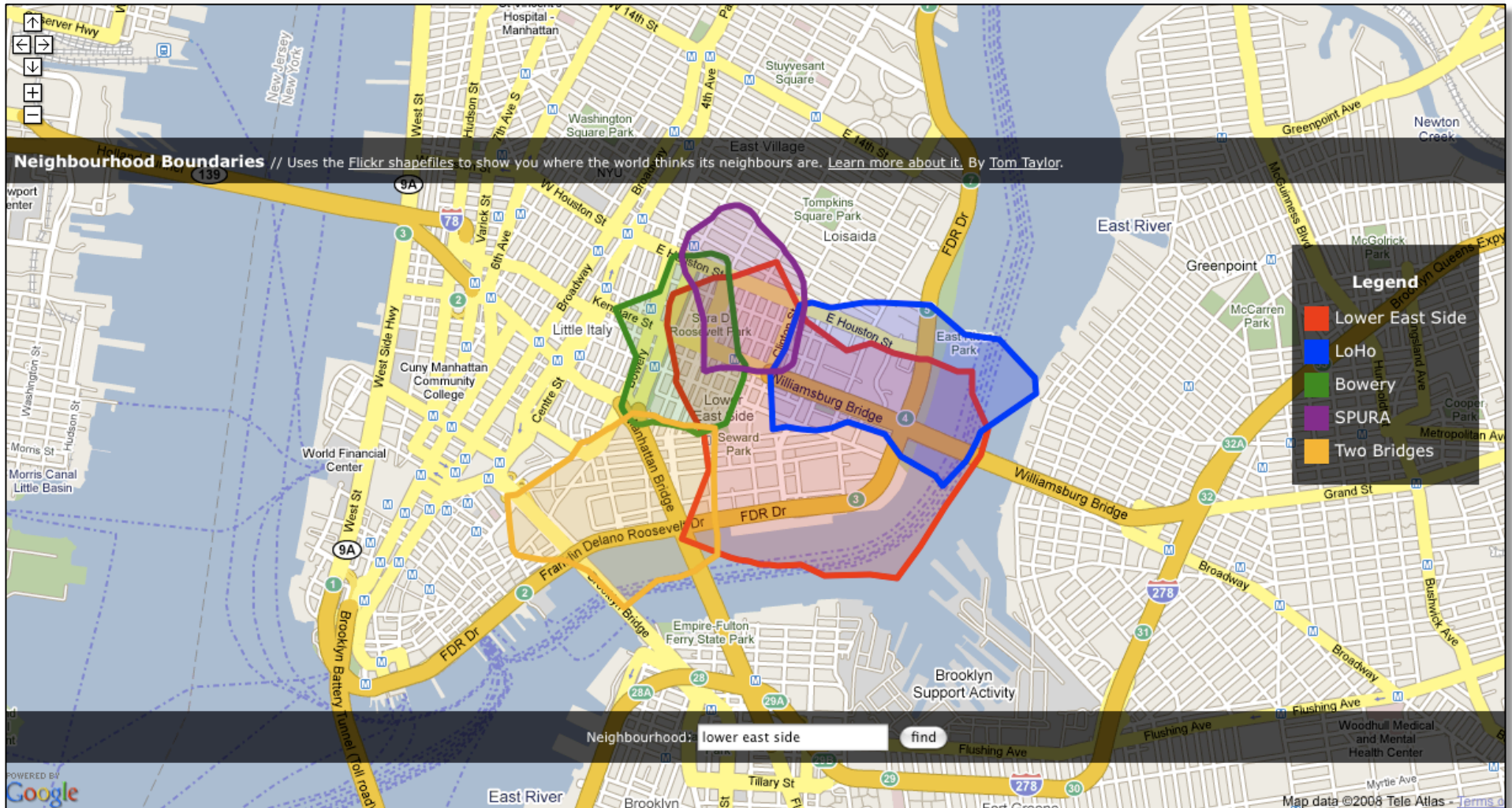
Tag Patterns



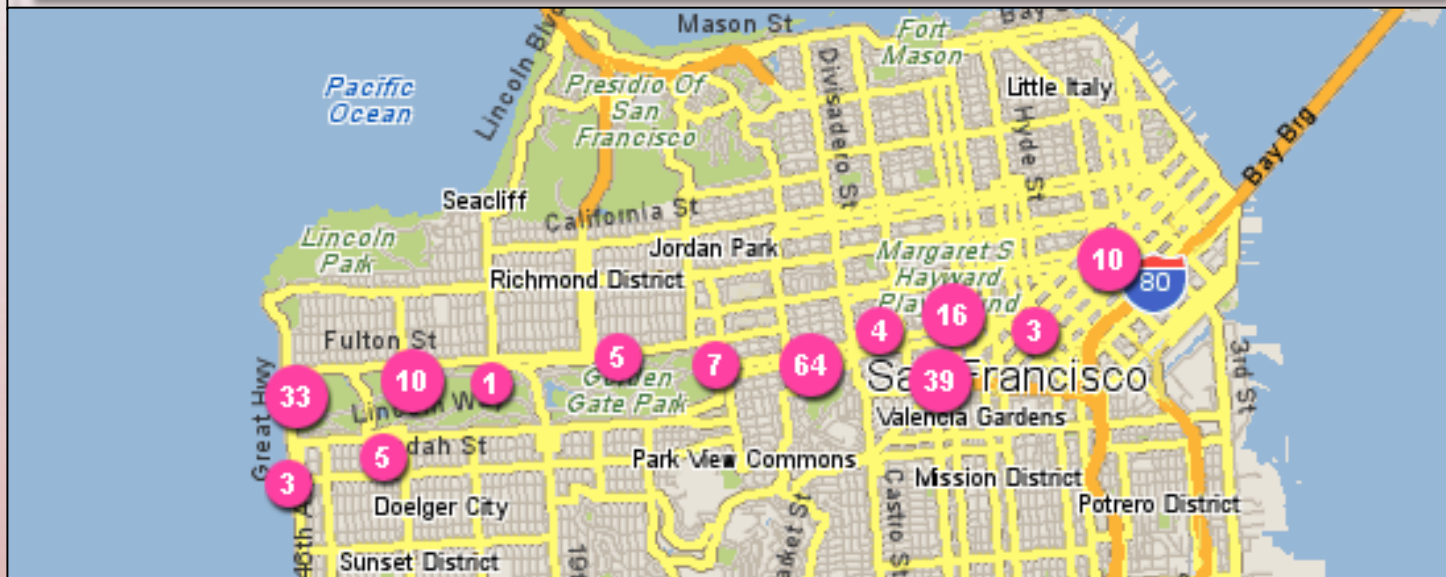
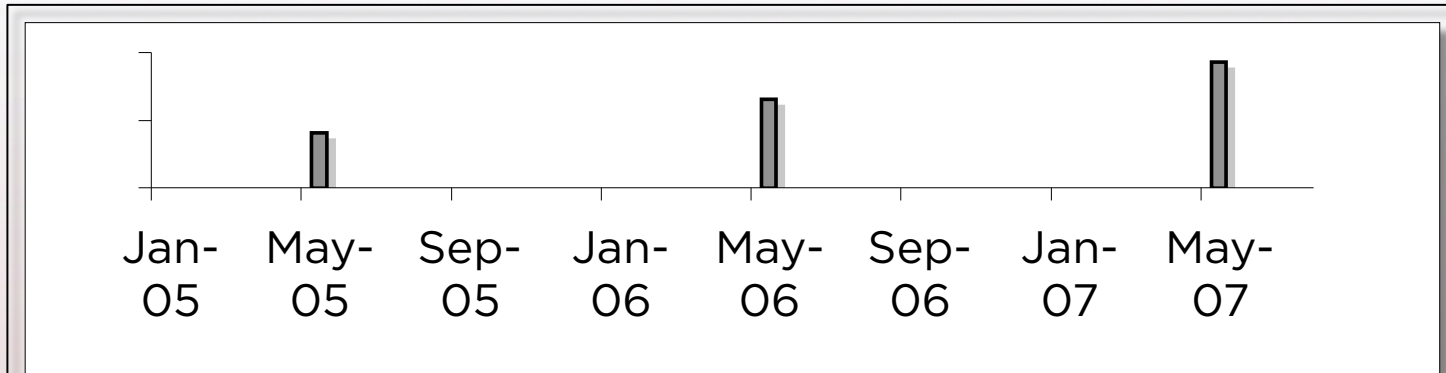
Tag Patterns



Folkpolygons



Also: Time



Extracting “Semantics”

- Examine all the photos associated with a tag
- Does the tag describe a place? An event? Neither?
- Using scale-structure clustering and measures of entropy





Tag: BYOBW

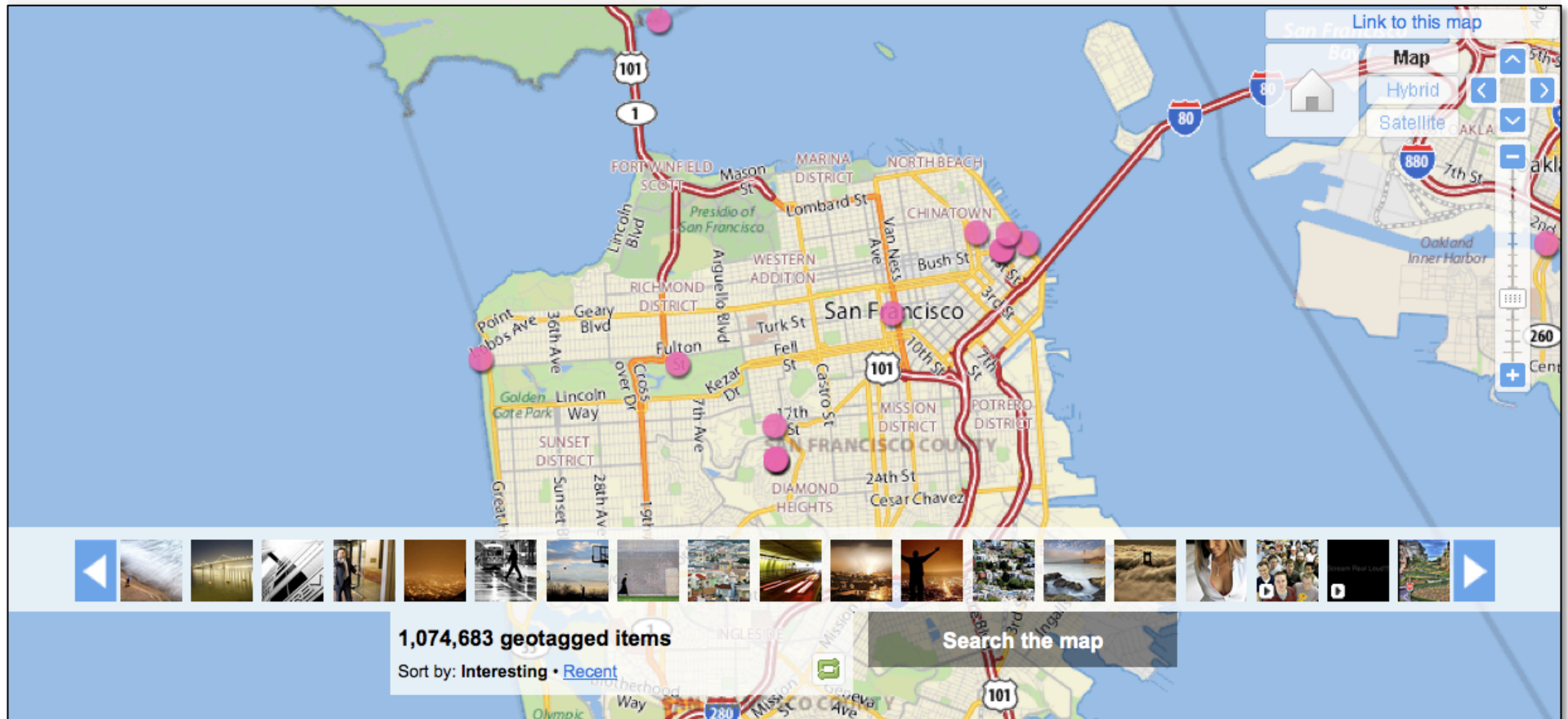
flickr

<http://flickr.com/photos/statico/2359648441/>

Where are we going?

- The motivations
- The data
 - Semantics from unstructured data
 - Tag Maps / World Explorer
- The multimedia
- A semantic web?

A Better Representation of Place



Intuition

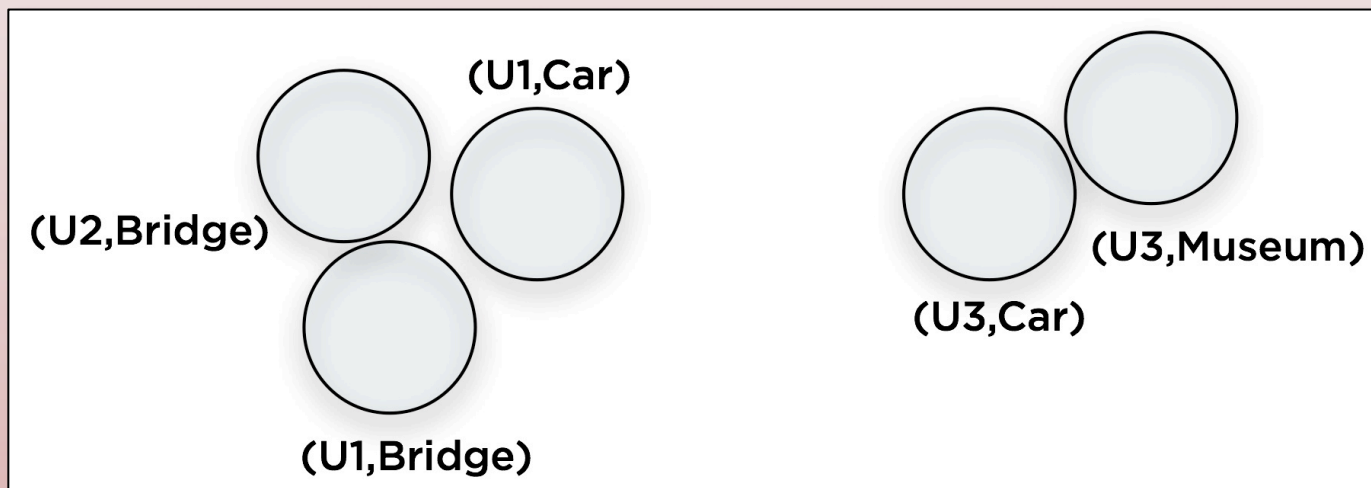
More “activity” in a certain location indicates the importance of that location

Tags that are unique to a certain location can be used to represent the location

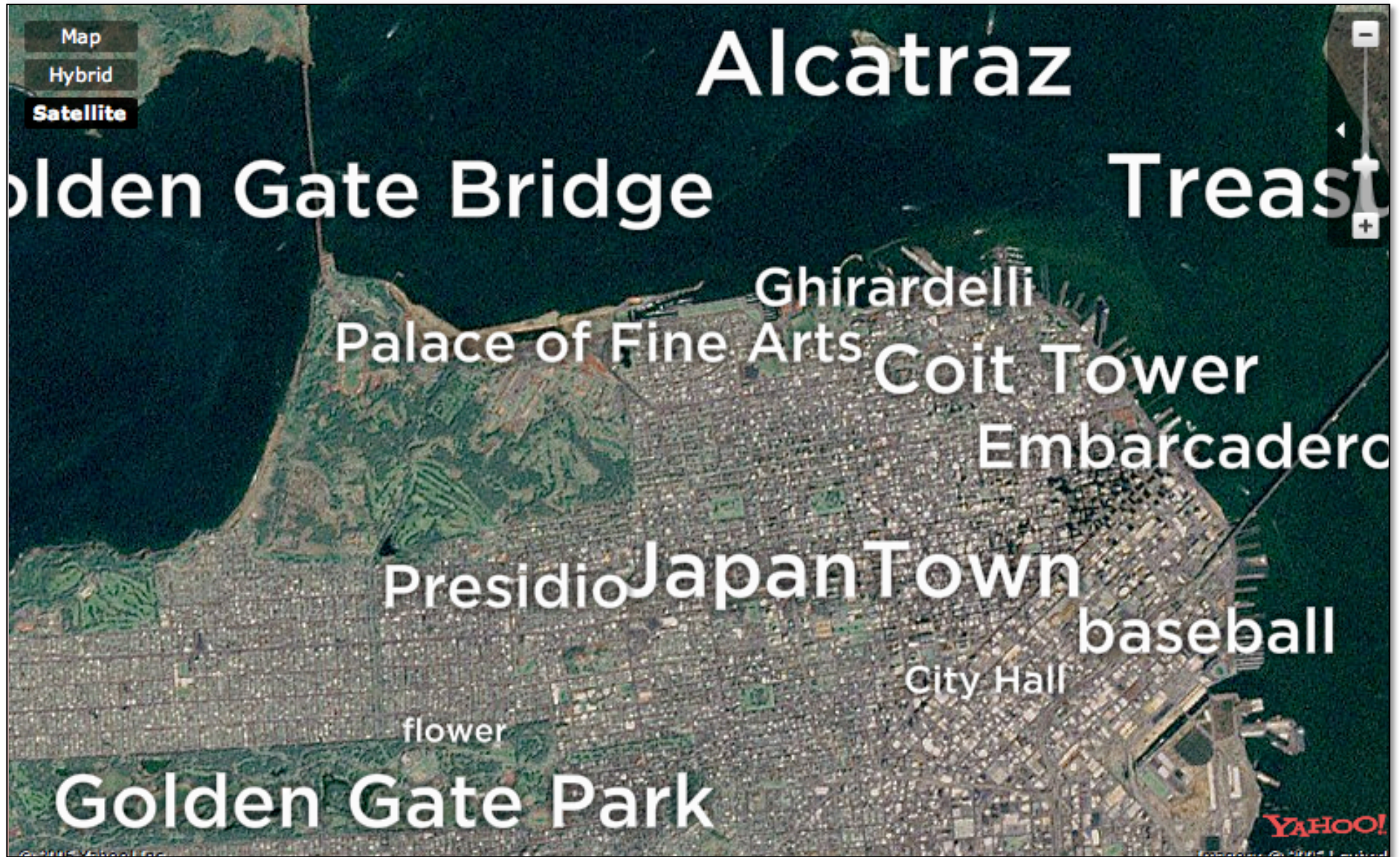


Algorithm

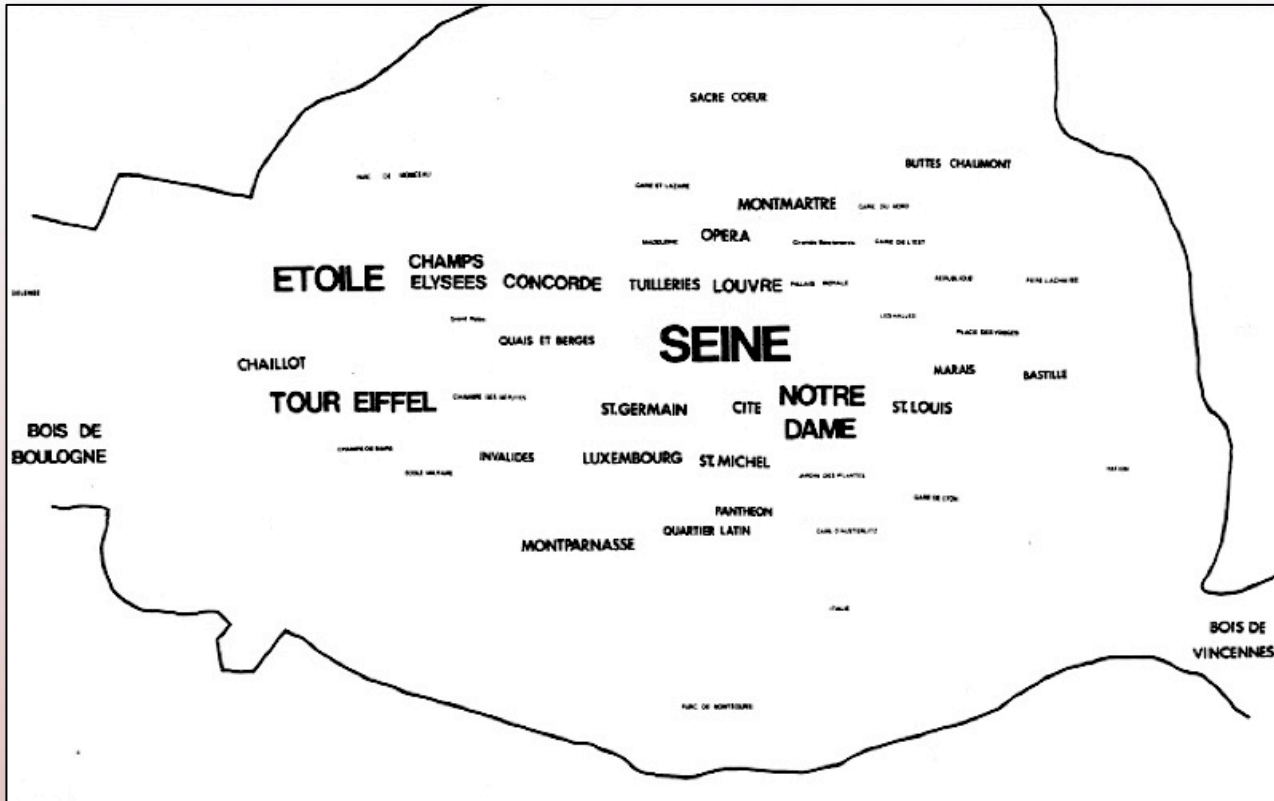
- Document are clusters of photos
- Simple, tf-idf scoring of each tag based on clusters (document)



++40,000,000 photos:



Side note from 1976



Stanley
Milgram, 1976.
"Psychological
Maps of Paris"

We can do Paris too!



Y!RB, 2006.
"Tag Maps:
World Explorer"

Live demo: World Explorer

The screenshot displays the World Explorer interface. At the top, there is an input field for "Enter location" and a "Take me there!" button. Below this, a navigation bar includes "Map", "Hybrid", and "Satellite" options. The main map area shows San Francisco with various landmarks labeled, including Alcatraz, Golden Gate Bridge, and Coit Tower. A search box on the left contains the text "Also see here:" and lists related terms like "bridge", "Golden Gate", and "San Francisco". On the right side, a gallery of photos is shown, with a prompt: "See irrelevant photos? Click 'x' to close them!". The bottom of the map area features the Flickr logo and a URL: <http://flickr.com/photos/wynandvanpoortvliet/264171197/>.

<http://tagmaps.research.yahoo.com>

Ahern et al. [JCDL 2007]



Where am I going with this?

- The motivations

- The data

- The multimedia

- A semantic web?

Where am I going with this?

- The motivations
- The data
- The multimedia
 - Flickr landmark representation
 - YouTube audio synchronization (if time)
- A semantic web?

Multimedia Opportunity!

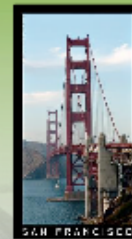
- We used social media to identify semantics of various tags
- Can we apply *targeted* image analysis methods in a *robust* way?

Challenges

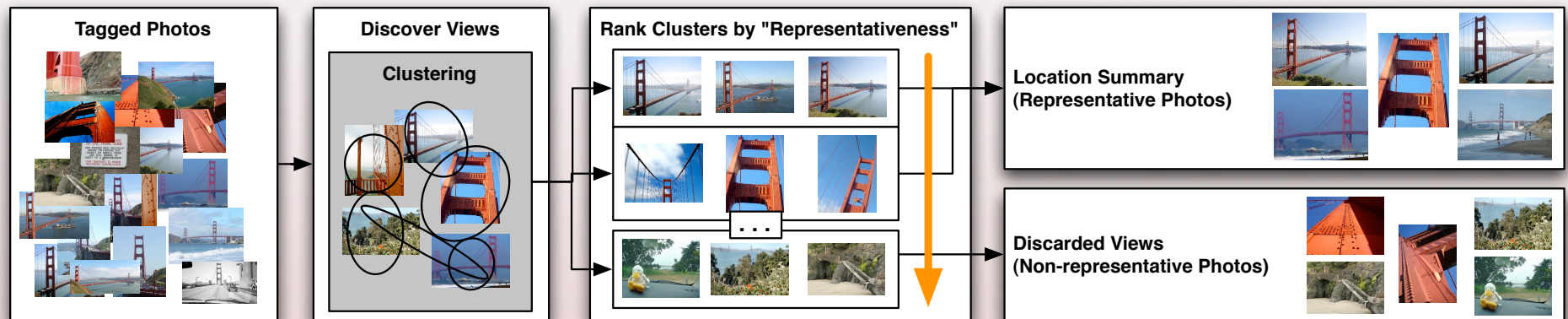
- Content is still hard...
- Unstructured data (no semantics)
- Tags, not ground truth labels
- Noise
- Scale
 - Computation
 - Long tail means no supervised learning

Representative Content

- We identified the “landmark” tags
- We know where their photos are taken
- Can we select the most representative photos?

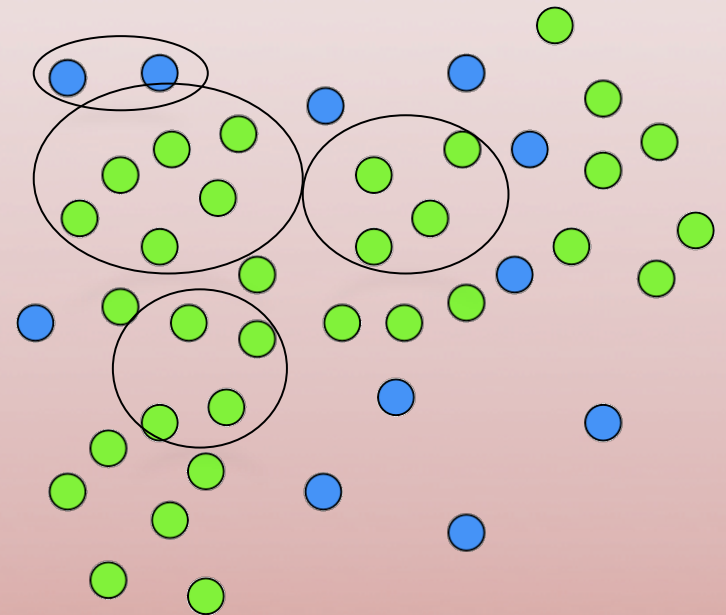


1000000 photos overview



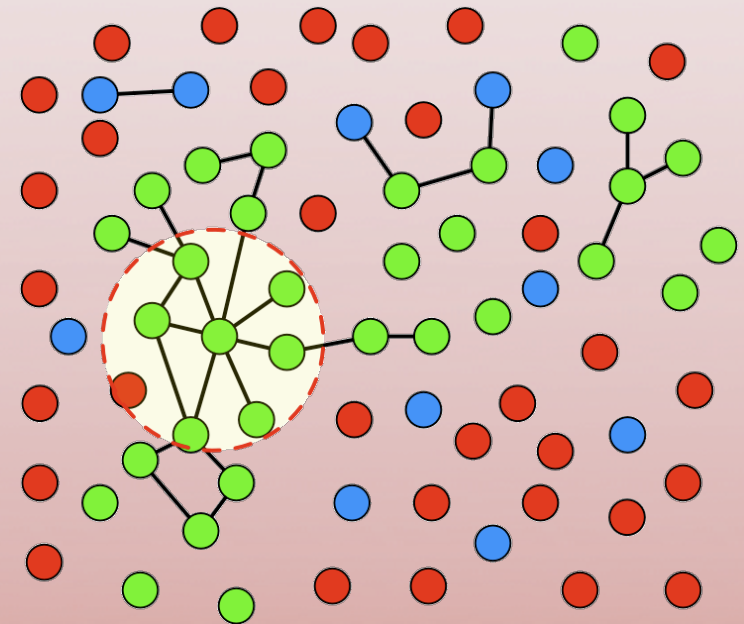
Technology: Clustering

- Visual clusters predict similar views
 - Color, texture
 - Simple k-Means



Technology: Ranking

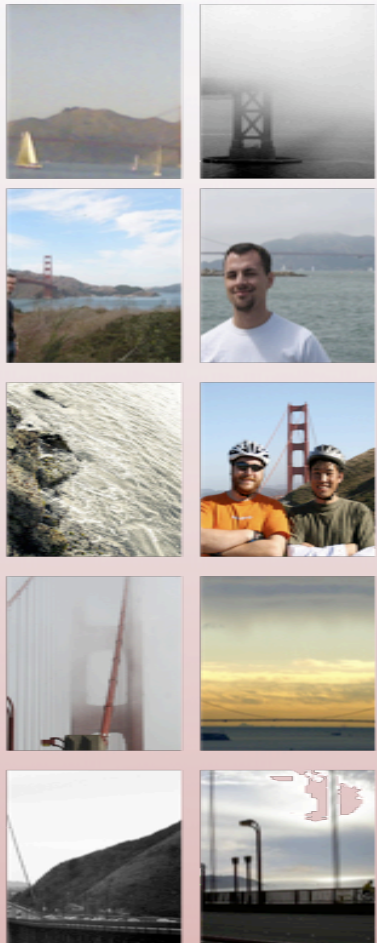
- Repeated features suggest relevance/representativeness
 - SIFT



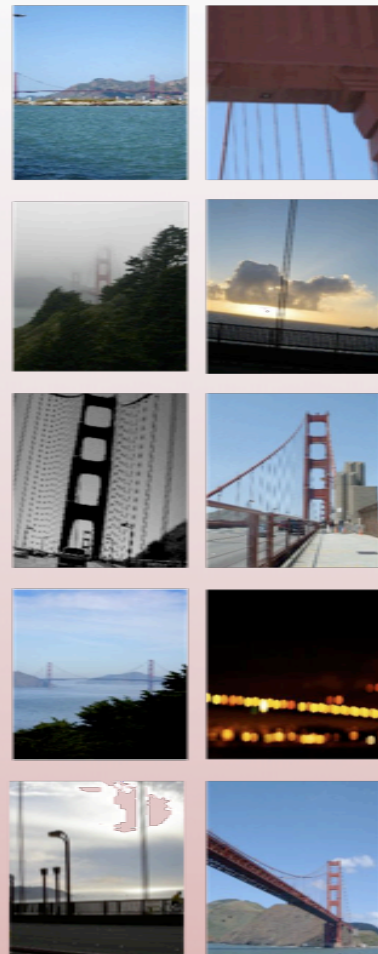
Ranking Considerations

- Number of users
- Temporal spread
- Inter vs. Intra-cluster similarity
- Visual coherence
- Visual connectivity

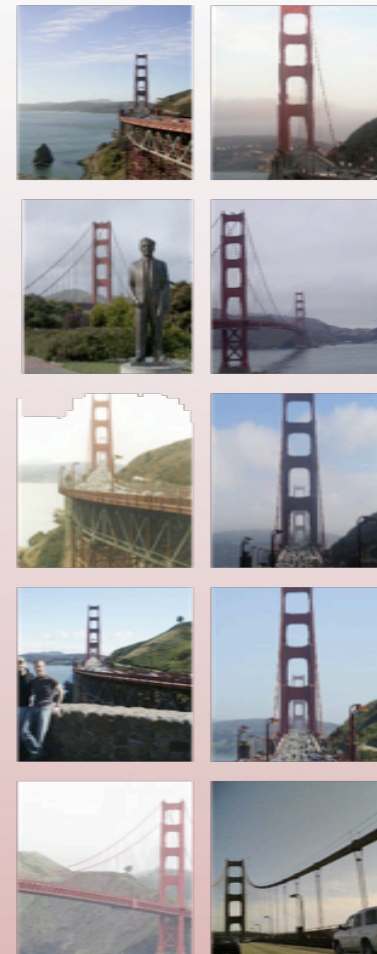
Sample Results - GG



Tag only



Tag + Location

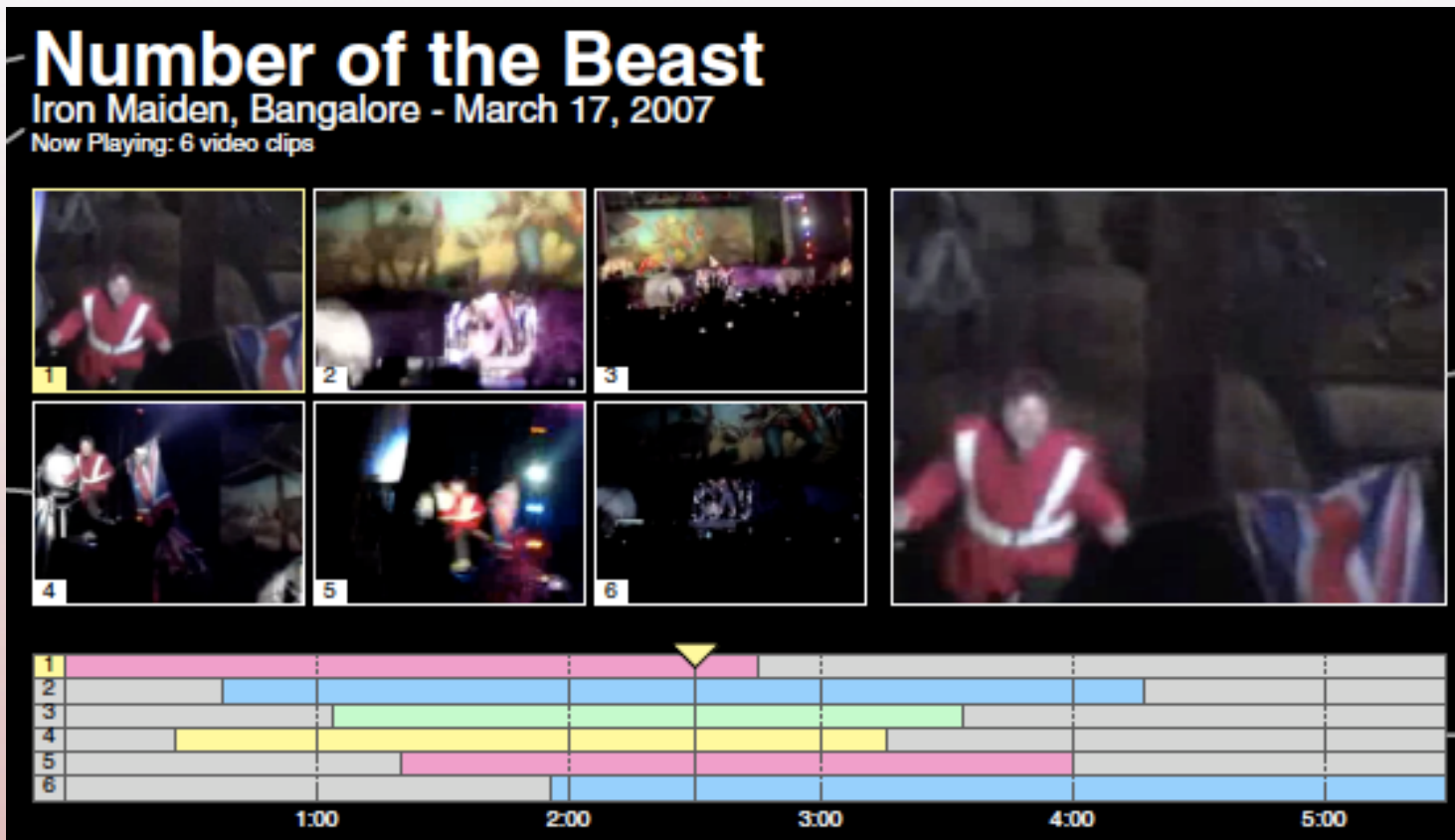


Tag + Location + Visual

Onto YouTube

- Tons of content
- Used context tools to crawl all videos taken at the same event
- Audio Fingerprints to find/sync overlapping videos

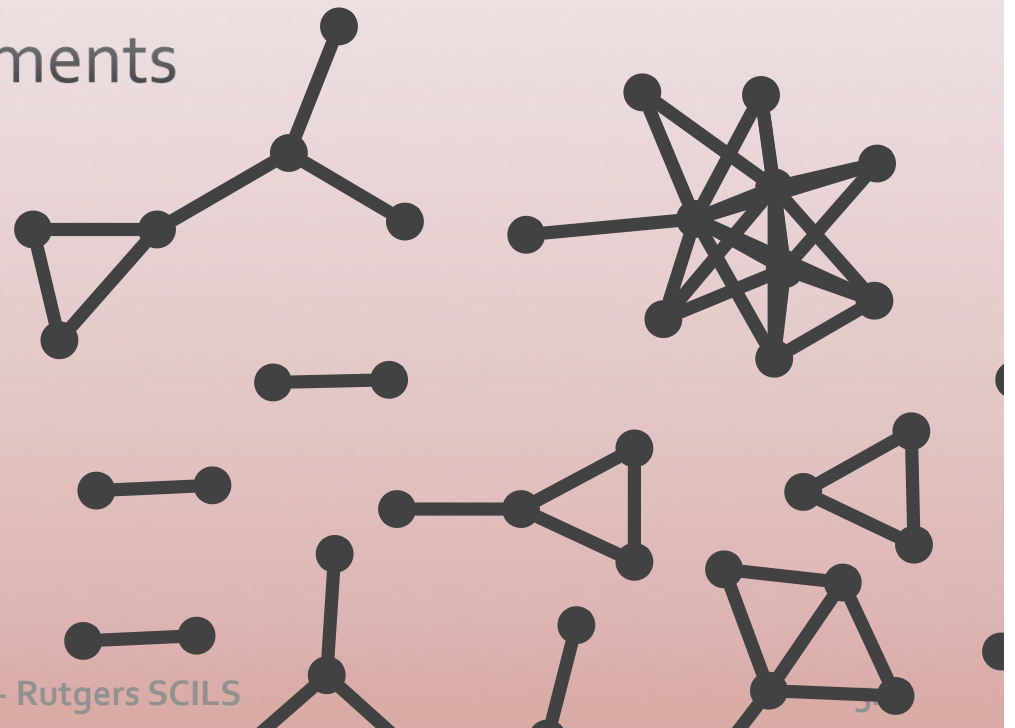
Better Access



W/ Lyndon Kennedy, in submission

Better Metadata

- Grouping based on link graph
 - Emerging concepts
 - Significant moments of interest
 - Quality audio segments



Where am I going with this?

- The motivations
- The data
- The multimedia
- A semantic web?

Machine tags – Emerging Semantics

“Machine tags are not RDF... but they can play RDF on TV”

– Aaron Cope, Hackr



- Lastfm:event=352444
- Camera:lens=35mm
- ...

Folk semantics

- xCal, Location, vCard, microformats
- GeoNames, openSocial, Facebook IDs, Email (identity, kind of)
- Twitter #
- Addressable leading platforms of content: Wikipedia, Amazon, iTunes

Driven By Major Players

- Yahoo! Search Monkey
- Outside.in location-based aggregator
- What if Google did it?

- Thinking about motivations...

Summary

- Self-Social-System motivation
 - When building new user-driven applications and designing new systems
- Can apply content analysis to social media when domain is clear despite scale and noise

Notes

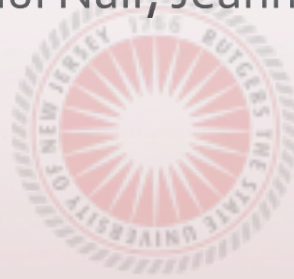
- All photos CC or with permission
 - <http://flickr.com/photos/cenz/16128560/>
 - <http://flickr.com/photos/oneeighteen/1610814928>
 - <http://flickr.com/photos/klash/858533852/>
 - <http://flickr.com/photos/dooptheory/372807360/>
 - <http://flickr.com/photos/statico/2359648441/>
- Didn't talk about: ZoneTag, Zurfer (for your Nokia phone) – just look for them...

That Last Slide

- Thanks: Lyndon Kennedy, Tye Rattenbury, Alex Jaffe, Shane Ahern, Simon King, Rahul Nair, Jeannie Yang @ Y!

mor@scils.rutgers.edu

<http://mornaaman.com>



RUTGERS

- Faculty: SCILS is looking for *you*:
 - Health information, Global Democracy, Social Media
 - <http://scils.rutgers.edu>
- PhD students: yes, you too.
- ***[HTTP://MULTIMEDIAGRANDCHALLENGE.COM](http://MULTIMEDIAGRANDCHALLENGE.COM)***