

Tagging *Work in progress!* Ability

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Joint ***PLEASE INTERRUPT!!*** Singla

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Image Tagging on Flickr

flickr

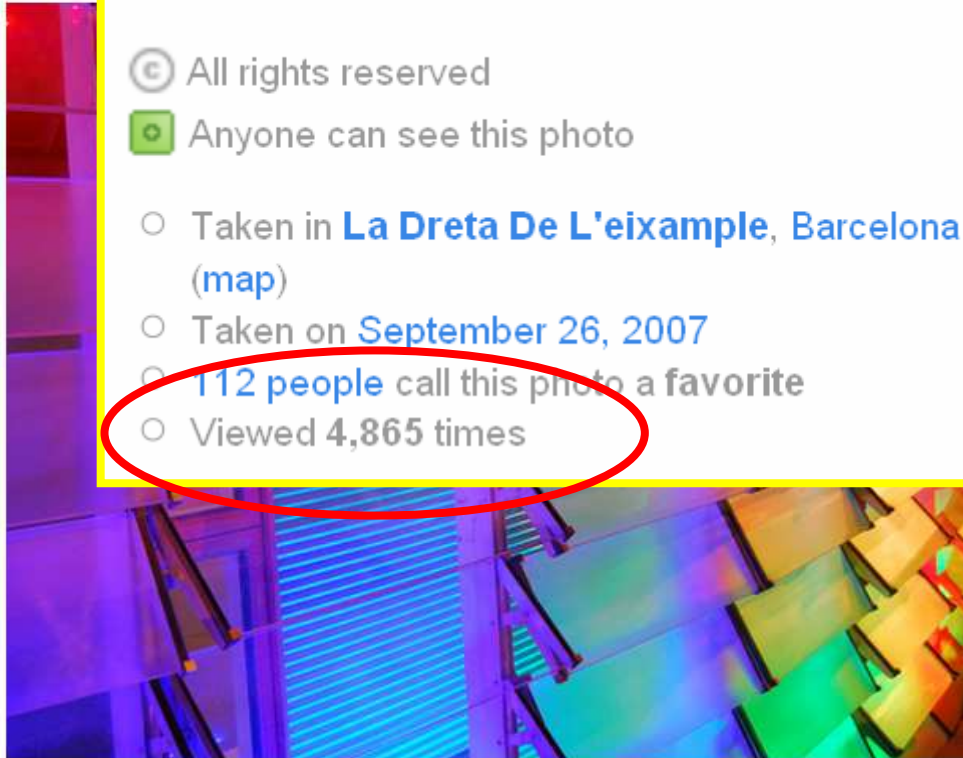
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Detail of LEDs and shutters at the at the Torre Agbar, Barcelona (II)

Additional Information

- All rights reserved
- Anyone can see this photo
- Taken in [La Dreta De L'eixample, Barcelona \(map\)](#)
- Taken on [September 26, 2007](#)
- [112 people](#) call this photo a favorite
- Viewed **4,865** times



See my website [Tilted Image](#) for more photos and contact details.

More nice colours from the LEDs of the Torre Agbar, Barcelona.

Comments

Tags

- torre
- agbar
- Barcelona
- barcelone
- spain
- new
- jean
- nouvel
- shutter
- led
- lights
- shutters
- glass
- modern
- architecture
- september
- 2007
- rainbow
- ColourArtAward

torre agbar

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Why People Tag Images

		<i>Function</i>	
		Organization	Communication
<i>sociality</i>	Self	<ul style="list-style-type: none">* Retrieval, Directory* Search	<ul style="list-style-type: none">* Context for self* Memory
	al	<ul style="list-style-type: none">* Contribution,	<ul style="list-style-type: none">* Content

**Use text search on tags to navigate to a *particular* item.
Private image collection gets *bigger and bigger*.
Linear scan of all items too slow.
Want to “zoom in” to a *small result set*.**

Part 1

- A model for tagging and navigability
- Asymptotic growth of
 - number of tags applied
 - vocabulary size

What are Possible Tagging Strategies

- Great precision:
 - a unique label per image suffices (“ID_3485”)
 - vocabulary size increases linearly
 - difficult to remember
- Great recall:
 - easy to remember labels (“photo”)
 - vocabulary size increases slowly/not at all
 - large result set

How to Model Navigability

- Perfect Memory Model:

t is a term

– The user remembers *all* the tags applied

$p(t)$ probability of remembering t $\forall t: p(t) = 1/n$

$f(t)$ fraction of images labeled with t

n collection size
– the user remembers *frequent tags* more easily

– $\forall t: p(t) = f(t)$

– Leads to definition of *Navigational Power (NP)*

Optimistic assumption 1:
• Hybrid Model:

Only remembers tags which were **actually applied!**

– higher λ = better memory

Definition: Navigational Power

Expected “removed” fraction due to term t

$$NP(t) = p(t) \cdot (1 - f(t))$$

NP maxi **Plausible *qualitative* behavior.**

$f(t) = (1-2\lambda)/(2-2\lambda)$ if $\lambda < \frac{1}{2}$ (poor memory)

$f(t) = 0$ otherwise (good memory)

Not too specific (else forgotten)

Not too general (else no zooming in)

How to Maintain a Small Result Set

- (Temporary) optimistic assumption 2:
 - m tags are applied *independently*

We want: $n \cdot \prod_t (1 - NP(t)) \leq k$

product over m factors \leftarrow result set size

If $NP(t) \leq NP_{\max} < 1$ then $m = \Omega(\log(n))$

Vocabulary growth: $|V| = \Omega(\log(n))$

If perfect memory, then $NP_{\max} \rightarrow 1$

Don't need full independence to obtain bounds...

Punchlines – Part 1

- Perfect memory:
 - constant number of tags per objects suffice
 - vocabulary grows linearly
- Imperfect memory:
 - number of tags has to increase at least logarithmically
 - vocabulary grows at least logarithmically

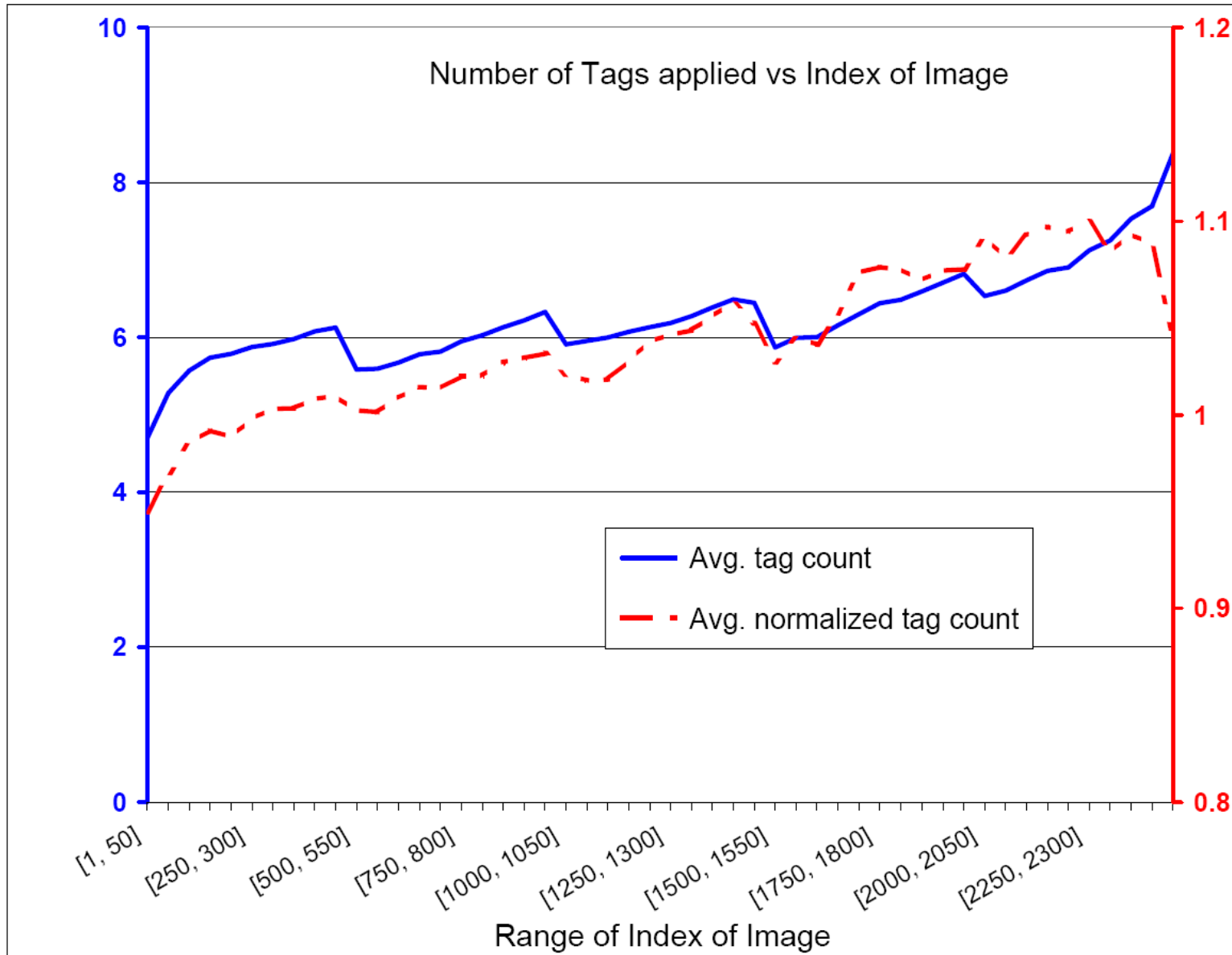
Part 2

- Do users tag more *as their collection grows*?
- Do “large” users tag better than small users?
- Is it more difficult for large users to navigate?

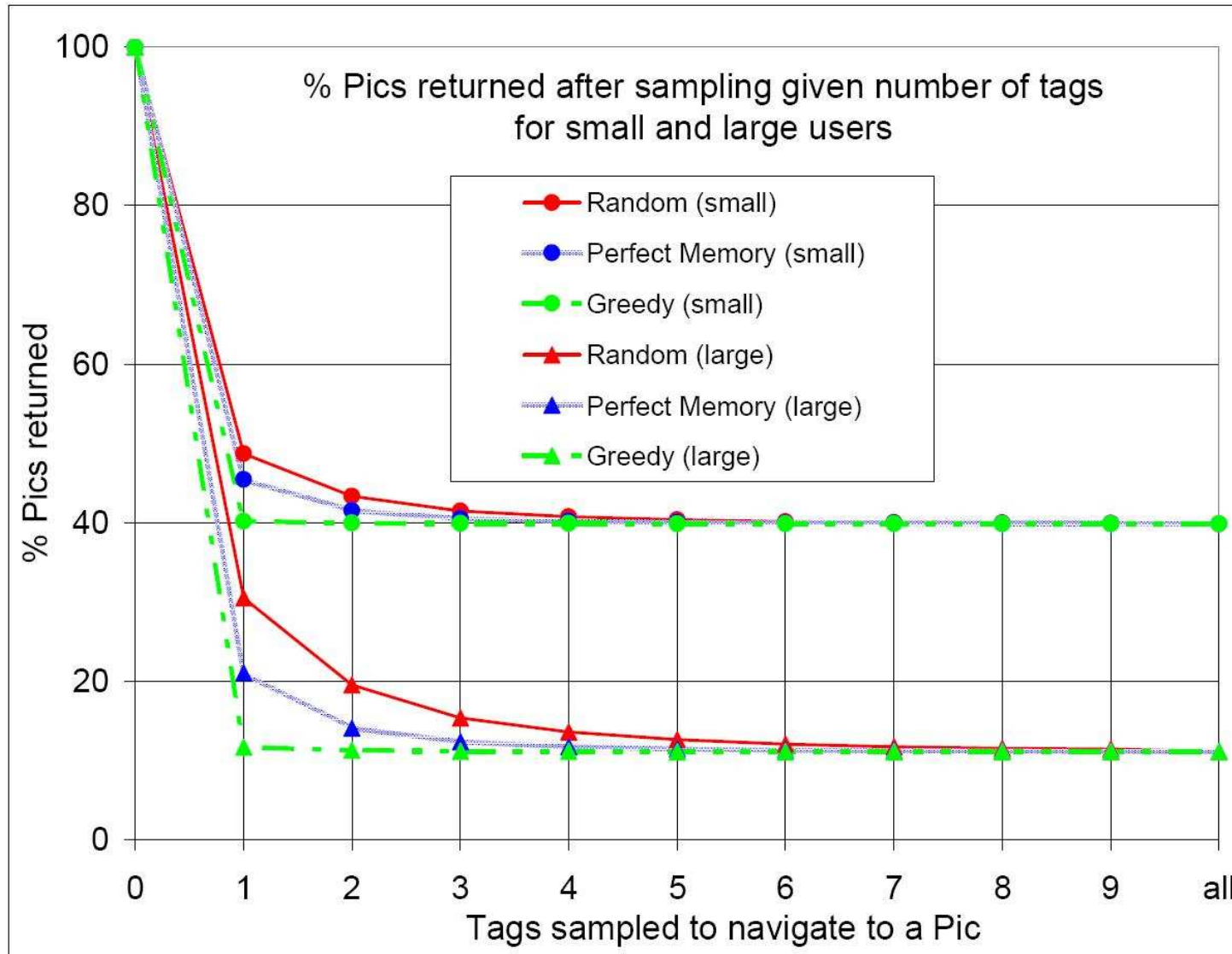
Experiments: Data Set Used

- 42k “active” users
- Uploaded a tagged image on July 16, 2008
- 12M public tagged images
- Collection size: average 285, median 102
- award tags removed (“flickr’sbest”, ...)
- 70M tag occurrences

Number of Tags as Collection Grows



Observed Navigational Power of Tags



← 1-50 pics

← 250+ pics

Punchlines – Part 2

- Users tag more as their collection grows
 - navigational reasons?
 - getting to know Flickr?
- Tags are highly dependent
 - doesn't get better than adding the single rarest tag

Part 3

- What's tagged vs. what's viewed?
- A tag can be frequently used on
 - uploaded pictures
 - viewed pictures

What's Tagged – What's Viewed

pos	by usage	by views
1	2008	portrait
2	2007	girl
3	nature	nikon
4	canon	woman
5	nikon	nature
6	flower	blue
7	art	canon
8	beach	water
9	water	red
10	portrait	sky
11	travel	bw
12	wedding	art
13	sky	bravo
14	bw	2007
15	flowers	beach
16	blue	sexy
17	2006	people
18	family	beautiful
19	macro	macro
20	party	green

Sort tags t by

- number of images using t
- number of views attracted by such images

Punchlines – Part 3

- Mostly used, not viewed:
 - holidays, vacation
 - friends, family, celebrations
- Mostly viewed, not used:
 - girl, woman, model
 - sexy, beauty, pretty, beautiful,
 - clouds, landscape, sea
 - hdr, light, explore

Is there a good public indoor swimming pool?

Thank you!