

User intentions in multimedia or “The other end of the camera ...”

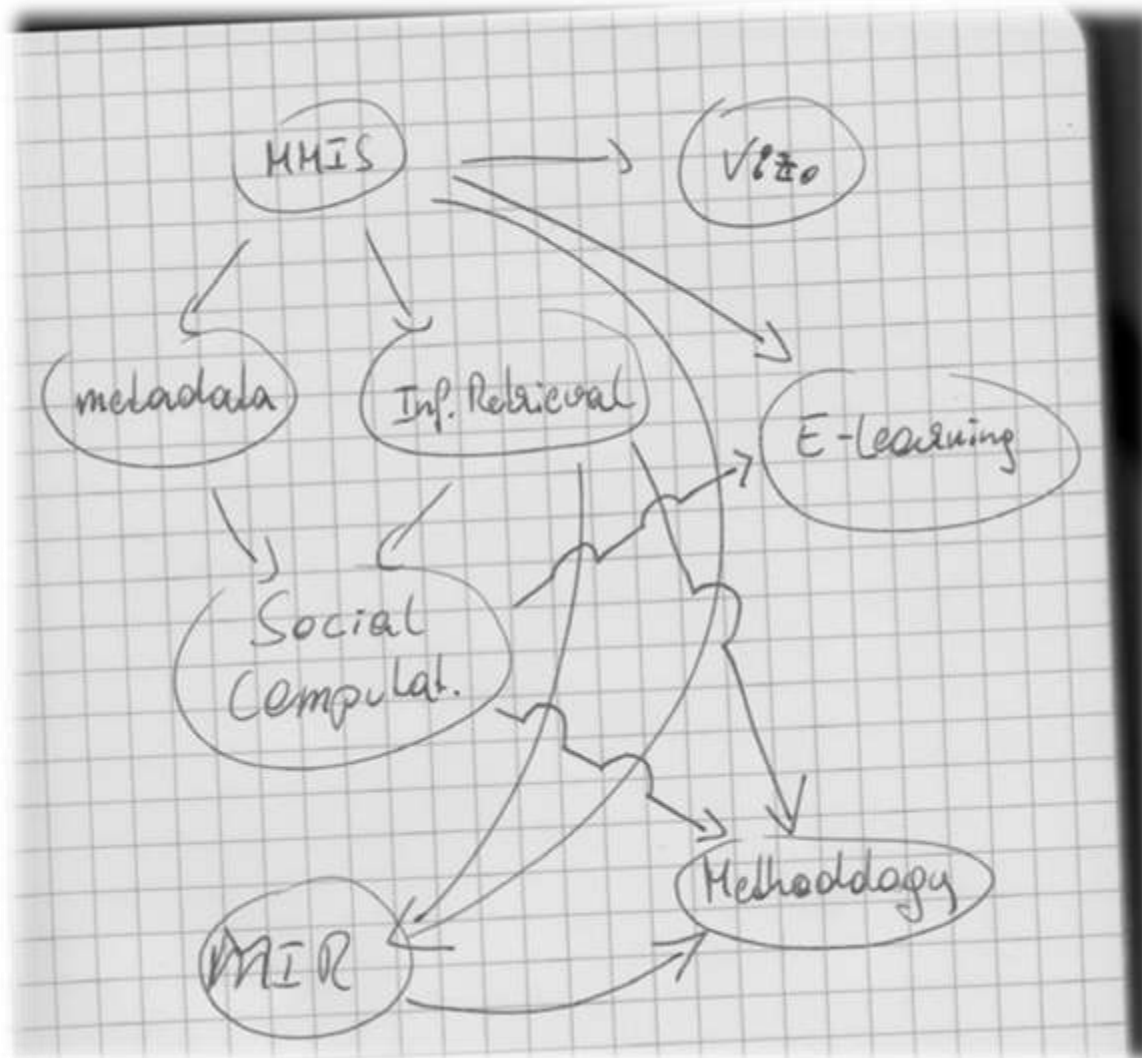


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Research Areas & Connections



More & More Questions ...



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All my previous work led into one single direction:

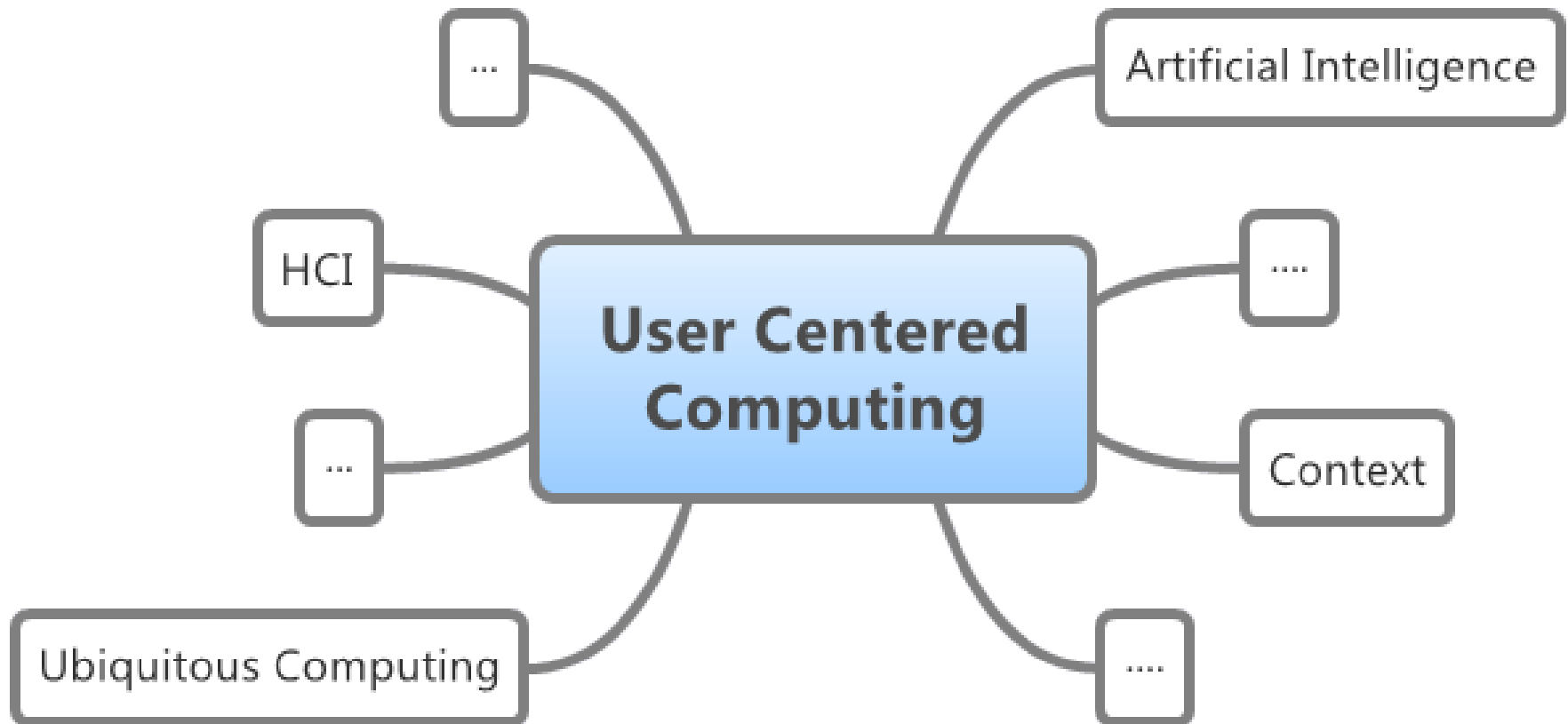
- What does the user actually want and how to support the user in her/his work with the computer?



User centered computing



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Context-Awareness



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[...] context-aware software adapts according to the location of use, the collection of nearby people, hosts, and accessible devices, as well as to changes to such things over time [...]

Src. B. Schilit, N. Adams, and R. Want. (1994). "Context-aware computing applications" (PDF). IEEE Workshop on Mobile Computing Systems and Applications (WMCSA'94), Santa Cruz, CA, US. pp. 89-101.

Context ...



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- Is a broad concept
- Can be defined in different ways
 - depending on domain
 - depending on application

*Idea: pick out **most promising piece** of the „context“ and take a look at it!*

User Intentions



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- Users have certain intentions
 - ... doing something intentional ...

Hypothesis: *If I know the intention of a user beforehand, I can better support her/his actions.*

User Intentions: Example



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A user wants to buy a car, but there is no pressing need.

- The users intention is “buy a car”
- The actions resulting from the intention might not be directed and planned
 - “Oh, there is a car I like ...”
 - “I’ve heard you’re going to sell your Prius...”

User Intentions



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- Intentions are fuzzy and vague
 - Hard to measure ...
- Concept of “user goals”
 - .. state of affair that a user wants to achieve ...
 - Can be measured: (not or partially) achieved

User Goals: Example



A user wants to buy a car, but there is no pressing need.

- The users intention is “buy a car”
- Possible goal “find car that fits the users needs”
 - Task: Searching for a car with specific characteristics
 - End of the task: Car found

=> Goals are very specific

Agenda



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- ~~Motivation & Introduction~~
- User goals in text retrieval
- User goals in digital photo retrieval
- User goals & intentions in media production
- Outlook



A Taxonomy of Web Search



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- Navigational
 - The immediate intent is to reach a particular site
- Informational
 - The intent is to acquire some information assumed to be present on one or more web pages
- Transactional
 - The intent is to perform some web-mediated activity

Src. A. Broder, A Taxonomy of Web Search, ACM SIGIR Forum Vol 36, Issue 2, Fall 2002

Revised Taxonomy



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- Navigational
- Informational
 - Directed, Undirected, Advice, Locate, List
- Resource
 - Download, Entertain, Interact, Obtain

Src. Rose, D., Levinson, D., Understanding user goals in web search, Proc. WWW 2004, New York, USA (2004).

User Goals in Web Search

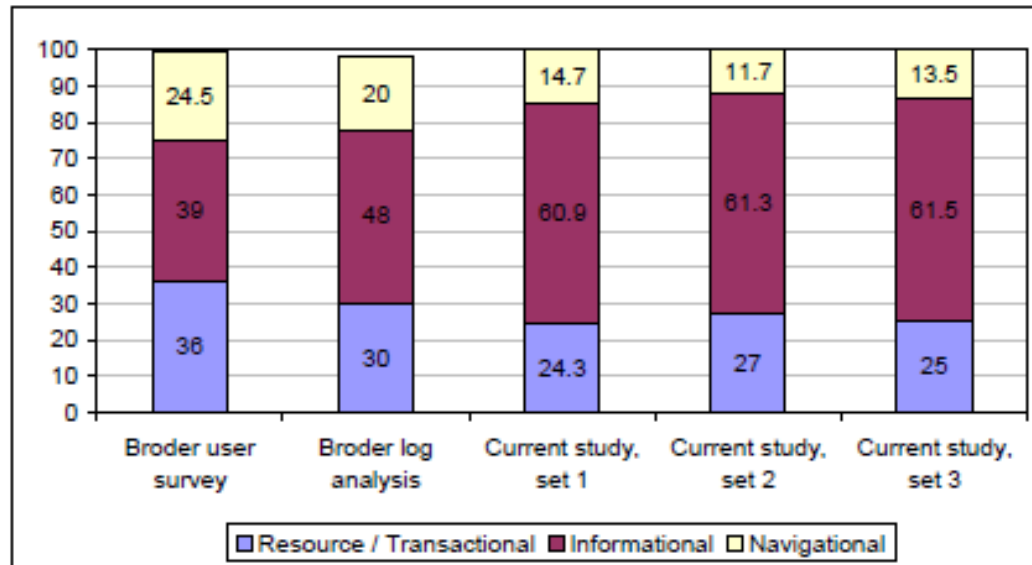


Figure 2: Comparison of Broder's search taxonomy to our top-level goals. Resource and informational results in the first column are Broder's estimates. Results do not total 100% due to rounding error.

Src. Rose, D., Levinson, D., *Understanding user goals in web search*, Proc. WWW 2004, New York, USA (2004).

How do users express goals?



Nr.	Query	Frame Annotation	Time Stamp	Goal
#1	How to get more wine crop	How to get more [item wine crop]	2006-03-30 19:29:59	Formulation
#2	Fertilizer or insecticide to increase wine crop	[cause Fertilizer] or [cause insecticide] to increase [item wine crop]	2006-03-30 19:45:28	Refinement
#3	Fertilizer to increase wine crop	[cause Fertilizer] to increase [item wine crop]	2006-03-30 19:46:11	Refinement
<i>[further non-intentional queries, not related to wine crop]</i>				
#4	Increase wine crop	increase [item wine crop]	2006-03-30 19:48:25	Generalization
#5	How to get rich wine crop	How to get rich [item wine crop]	2006-04-07 06:29:19	Different Goal Formulation
<i>[non-intentional query "wine crop"]</i>				
#6	How to have good wine crop	How to have good [item wine crop]	2006-04-07 06:40:45	Re-formulation
<i>[further non-intentional queries and further more complex intentional queries related to "wine crops"]</i>				

Degrees of Explicitness in Intentional Artifacts



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- How can we find explicit goals of users?
- How can search queries be classified as explicit intentional queries?
- Explicit goals vs. implicit goals

Example: *car, car Miami, car Miami dealer, buy a car in Miami, buy a used car in Miami, get loan to buy a used car in Miami*

Src. Strohmaier, Prettenhofer & Lux, Different Degrees of Explicitness in Intentional Artifacts: Studying User Goals in a Large Search Query Log, SKGOI'08 @ IUI'08, Canary Islands, Spain, 2008

Degrees of Explicitness in Intentional Artifacts



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- Experimental classification
 - Part of speech tagging on queries
 - Naïve Bayes classifier on
 - 98 instances (59 pos. & 39 neg.)

	Entire Dataset	Condensed Dataset
Queries	20,494,002	279,260
Explicit Intentional Queries	346,349-616,869	138,513-163,089
Implicit Intentional Queries	19,877,133-20,147,653	116,172-140,747
Explicit Intentional Queries, 95% confidence interval	1.69% - 3.01%	49.6% - 58.4%
Users	657,426	94,487

Classifier results ...



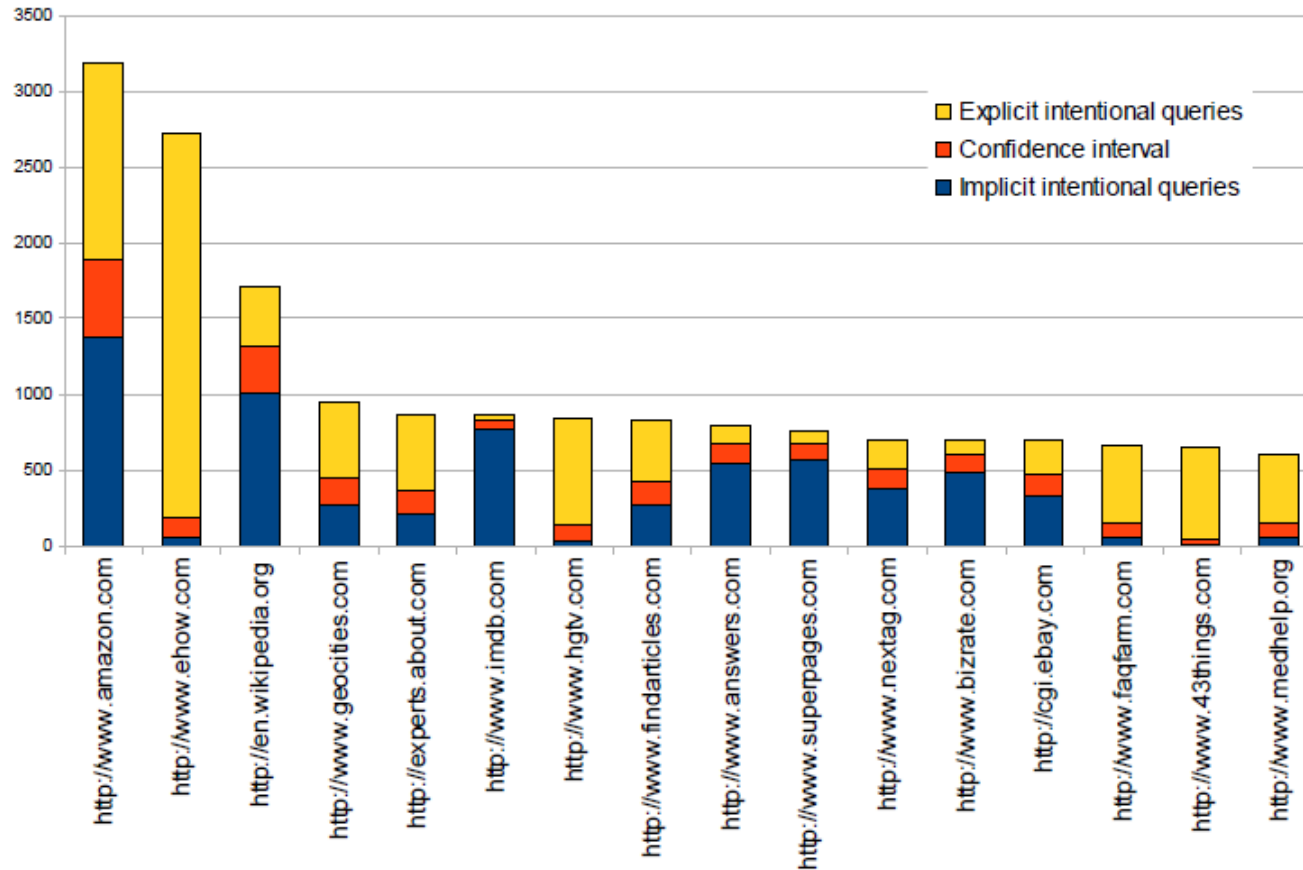
Correctly Classified Intentional Queries
"buying groceries online"
"how to get revenge on neighbor within limits of law"
"helping children handle death of a loved one"
"cleaning the ak-47"
"coughing up blood"
"dealing with the guilt of cheating"

Incorrectly Classified Intentional Queries
"saving privat ryan"
"driving school Illinois"
"stem cell transplant"
"founding fathers temple"
"recovering the satellites lyrics"

Website Shares in Condensed Data Set



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Powered by *demand media*:

- Mining questions from queries
- Pay people for answers
 - 20\$ per video,
 - 2 ½ \$ copy-edit,
 - 1\$ fact-check ...



see also http://www.wired.com/magazine/2009/10/ff_demandmedia/

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How do users express their goals on ... say Flickr ;)



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- Queries for photo search are short
 - “dog dachshund bark” rather than
 - “image showing a small dog, preferably a dachshund, barking for use in a brochure”
- Hypothesis: User goals affect the search and browsing behavior of users
 - Click-through rate, session time, medium click interval, etc.





Exploratory study on user goal classification

- Definition of tasks reflecting different types of goals
 - Interviews with experts using image search
 - Note: Verification of relevance of tasks needed
- Presentation of goals to users in a study
 - Recording of search behavior
 - Analysis of possible features for classification

Study setup



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- Taxonomy of Broder / Rose & Levinson
- 10 tasks from different classes
 - Find picture expressing joy
 - Find picture of the Eiffel Tower
 - Find picture taken with a Canon IXUS 980 IS
 - Find out how to tie a tie
 - ...

- Revised taxonomy needed
- Classification difficult ...
 - where do session start and end?
 - fuzzy transition between goals?
 - Dependencies between goals, subgoals etc.?
- Classification prototype
 - Rule based
 - Adapting results view

Taxonomy development



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- Several additional studies
 - Expert & non expert users
- Revised taxonomy
- Feature selection for classification

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Intentions in Media Production



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- Annotation tool for digital photos
 - done by two amateur photographers
- Two different roles
 - Creator
 - Consumer
- Study:
 1. How do users get along with the UI
 2. How do users get along with intentions for annotation

iPan: Intention-based Photo Annotation



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iPan preliminary Results



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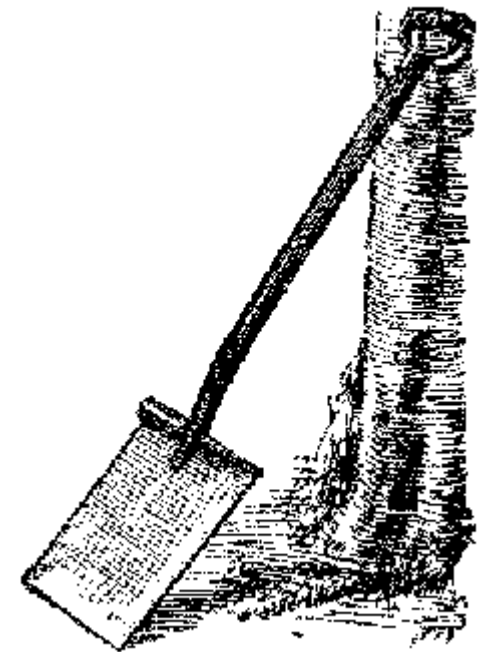
- Tool tested in photographers user group
 - 2 extreme types: intentional photos and non-intentional photos
 - Maybe artists, who want to hide intentions?
- Interviews have been rather discouraging
 - Mainly no intention to use such a tool
 - No understanding for “intentional photography”
 - One possible user => more like storytelling

Ongoing work ...



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- Annotation tool based on intentions
- Taxonomy of goals in media production
- Investigation for other media



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Users in a “near time” MMIS



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- Assume there is a big “Ironman” event
 - sequence of
 - 3.86 km of swimming,
 - 180.2 km of biking and
 - 42.195 km of running
 - like Klagenfurt in 2007:
 - 2,400 participants with support team (3-4 people)
 - 2,000 volunteers
 - 100,000 visitors
 - 6 moderators & DJs / 3 video walls
 - event lasted end to end about 17 hours



Users in a “near time” MMIS



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- Users have different roles
 - Participants, support, guards, journalists ...
- Users have different intentions
 - I want to track athlete XY
 - I want to track the lead
 - I want to follow events
- User participate in a “social MMIS”

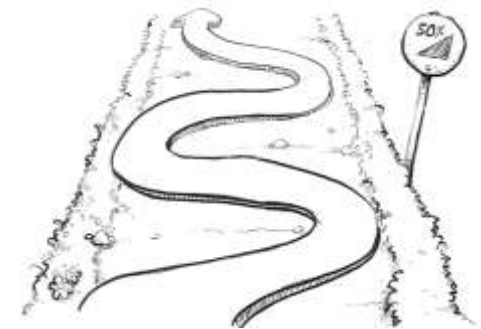


Intentions in a “near time” MMIS



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- User intentions can be made explicit
 - Classification, user feedback, context, etc.
- Intentions & goals can be leveraged to enhance retrieval and visualization of content
 - Relevance function (cp. popularity, 80:20)
 - Abstraction & summarization
 - Pro-active distribution



Summary & Conclusion



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User intentions

- ... have not yet been explored in MIR & MMIS
- ... may help bridging the semantic gap (from the other side)
- ... may help dealing with the “long tail”

Thanks ...



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... for your time

and: I'd be happy to discuss
the whole thing

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