UNC SCHOOL OF INFORMATION AND LIBRARY SCIENCE

THE OPEN VIDEO PROJECT
a shared digital video collection

Toward Multimedia Surrogates

Los Angeles Chapter of the American Society for Information Science and Technology

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Outline

- Surrogate roles
- The Representation Continuum
- Multimedia surrogates
- Open Video Case
  - Visual surrogates
  - Audio surrogates
  - The question of synchronicity
- Your surrogate
- Conclusions and Q&A

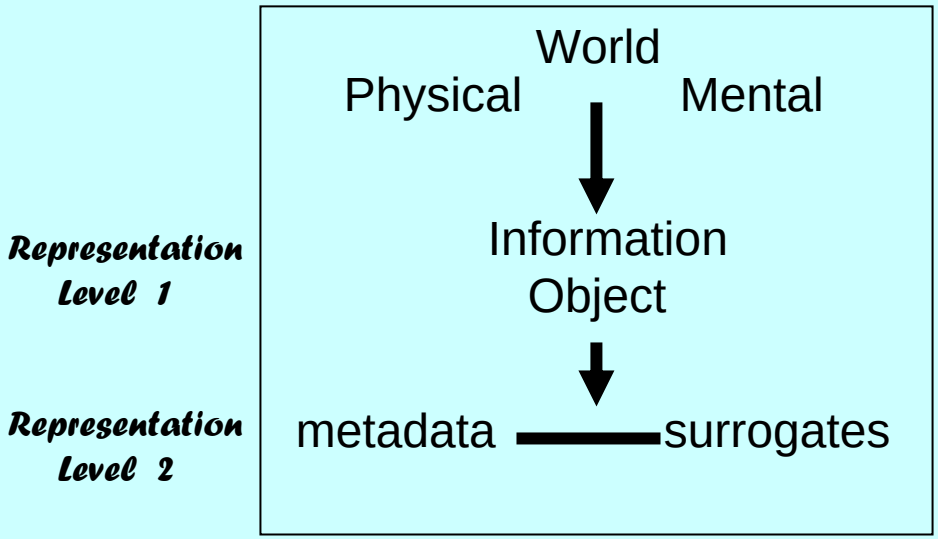
What is (was) a Surrogate?

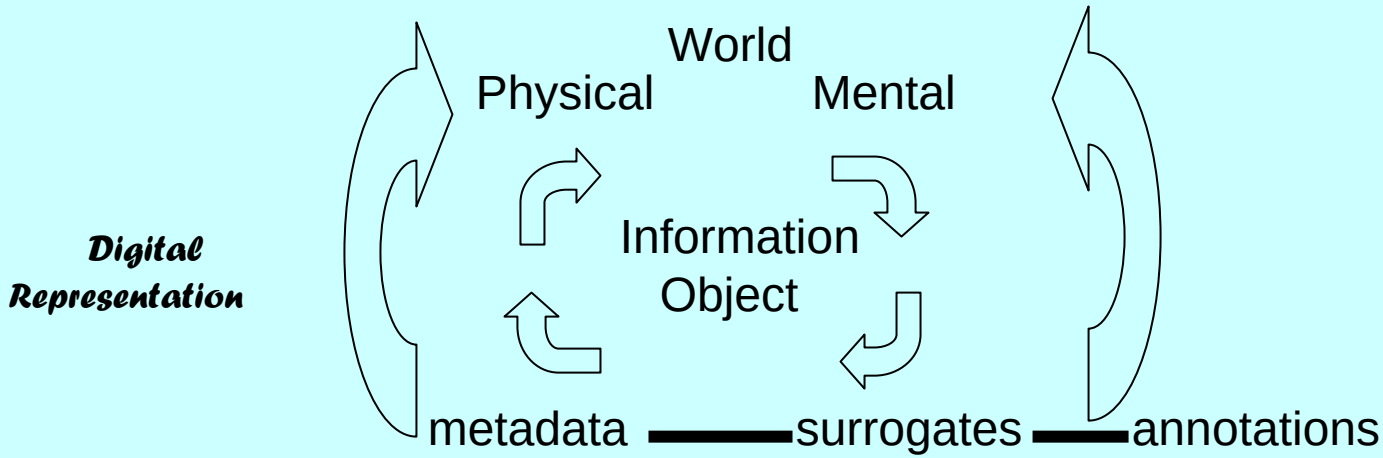
- Condensed representation constructed to stand for an information object
- Information compressions
- Surrogates
  - Enable decision-making by presenting search results in a uniform way
  - Support sense making and incidental learning
  - Save human time (compaction)
  - Save network capacity and system resources
- Examples
  - Abstract, gloss, summary
  - Title, bibliographic record
  - Preview, snippet
  - Profile
  - Logo

The Blur

- The (relatively) Neat Past and the Very Scruffy Present
  - Blurring the 'levels of representation' model of information (primary-secondary-tertiary-n-ary)
- The metadata—surrogate continuum within the levels of representation continua
  - Metadata region mainly for retrieval
  - Metadata region mainly for and by machines (semantic web)
    - Automatic metadata generation advances
    - Implicit links and mining of interactions as metadata
  - Surrogate region mainly for sense making
  - Surrogate region mainly for and by people
    - Professional abstracting
    - Social tagging and annotations/links as surrogates

Representation and the Digital Blur





Multimedia Surrogates

- Two kinds of meaning:
  - Surrogates for multimedia (non-textual Information objects)
    - Text
  - Surrogates that are not text
    - Album art, movie posters
- My research has focused mainly on video information objects, however….

Video Surrogates

- Driven by the technical community (signal processing, video retrieval)
- Identify feature sets (e.g., color, luminosity, optical flow, faces/shapes) and invent/adapt matching algorithms (e.g., IR models of feature frequencies such as large inter-frame changes in color histogram patterns implies scene change)
  - Companies like Virage and Sonic Foundry; projects like MARVEL and MAGIC
  - University projects like Informedia, Fisclar, Open Video
- TRECVID

Non-Textual Surrogates

- Poster frame: an image selected to represent the video, usually a single frame extracted from the video.
- Storyboard: a set of keyframes displayed in chronological order, usually in a tabular format.
- Slideshow: a series of keyframes presented for viewing one at a time for a few seconds each, i.e. as if viewing a slideshow.
- Collage: a dynamically-created, interactive image constructed of text and images from multiple videos, perhaps at different display sizes.
- Fast-forward: most easily created by selecting every Nth frame and displaying the frames at normal speed (30fps).
- Skim: a video clip ‘abstract’ created by compacting visual and audio information while preserving the original frame rate.
- Trailer: a pre-produced series of clips excerpted from a video.
- Spoken keywords or descriptions.

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Modify Search

Search: All fields

for

Genre: Educational

Duration: – Any Duration –

Format: – Any Format –

Color: Color B&W Either

Sound: Sound Silent Either

Search

Detailed Search

Page 1 **Search Results (93 videos found)**

Layout:

Sort by: Relevance

Results per page: 10

Video Browsing Interfaces for the Open Video Project (2001)
Overview of The Open Video Project.

Genre: Educational
Keywords: Open source; Digital video; Interface; Browse;
Duration: 04:52
Popularity (downloads): 341

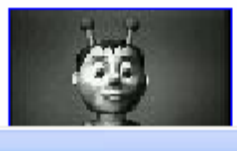
Talking to the Ceiling: An Interface for Bed-Ridden Manually Impaired Users (1999)
Video demonstration from the 1999 CHI conference.

Genre: Educational
Keywords: Interface; Impaired; User; CHI;
Duration: 07:04
Popularity (downloads): 193

Preview not available

Manipulative User Interfaces: Exploring Physically Embodied User Interfaces (1999)
Video demonstration from the 1999 CHI conference.

Genre: Educational
Keywords: Interface; Manipulative; Explore; Embodied; User; CHI;
Duration: 03:31
Popularity (downloads): 62



OLGA - A Multimodal Interactive Information Assistant (1998)
Video demonstration from the 1998 CHI conference.

Genre: Educational

The Open Video Project :: Video Results - Microsoft Internet Explorer

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dress http://www.open-video.org/results.php?view=text

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- Home
- Contribute
- About

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OLGA - A Multimodal Interactive Information Assistant	1998	06:48	Educational	219
Digital Ink: A Familiar Idea with Technological Might!	1998	08:33	Educational	200
ambientROOM: Integrating Ambient Media with Architectural Space	1998	05:30	Educational	143
An Animated Direct-Manipulation Interface to Digital Library Services	1997	06:58	Educational	77
Technology at Home: A Digital Personal Scale	1997	01:40	Educational	199
A GUI Paradigm Using Tables, Two Hands and Transparency	1997	10:18	Educational	156
A Tour of Teamrooms	1997	08:40	Educational	159

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Search

ex. "water" or "space shuttle" Search

Detailed Search

Related Video

- Video Grab Bag

Clerks tying bags, U.S.P.O.

Other random videos

- Measure of a Man
- Old mail coach at Ford, U.S.P.O.
- Worlds Smaller than Saturn, segment 03 of 4

more...

Video Details

Hoover Dam Construction, segment 12 of 17

7-sec excerpt

Storyboard

FastForward

Progress was made on structures appurtenant to the dam

Download: MPEG-1 • 10.22 MB

This video is one segment of a larger video title. See all 17 parts »

Video Information

Year:	1996
Genre:	Documentary
Keywords:	
Duration:	00:01:09
Color:	Yes
Sound:	Yes
Amount of Motion:	Medium
Language:	English
Sponsor:	Bureau of Reclamation
Contributing Organization:	Carnegie Mellon University, Informedia Project
Transcript Available:	Yes

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ex. "water" or "space shuttle" Search

Detailed Search

Related Video

Video Grab Bag

Dynamic American City, The (Part II)

Other random videos

- The Rio Grande, segment 07 of 9
- Mining operations, Pennsylvania coal fields
- Jealousy

more...

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The Open Video Project :: Video Details - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://www.open-video.org/details.php?videoid=596&surrogate=storyboard

Detailed Search

Related Video

- **Video Grab Bag**

Dynamic American City, The (Part II)

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more...

7-sec excerpt

Storyboard

FastForward

dam






Download: MPEG-1 • 10.22 MB

This video is one segment of a larger video title. See all 17 parts »

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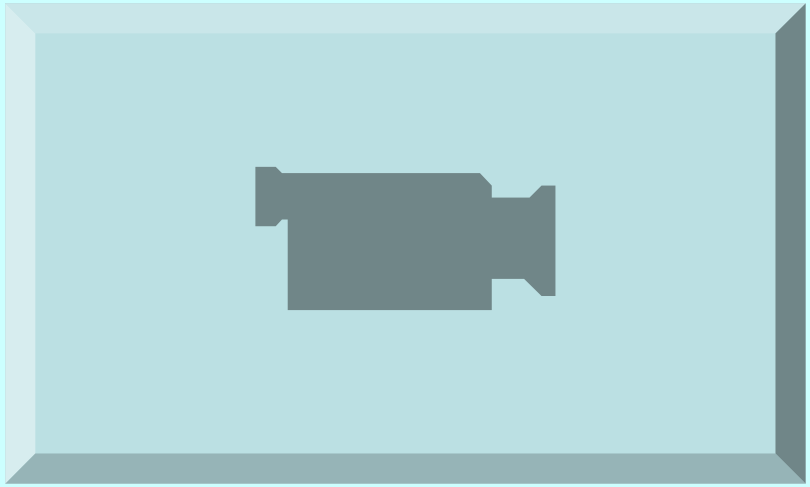
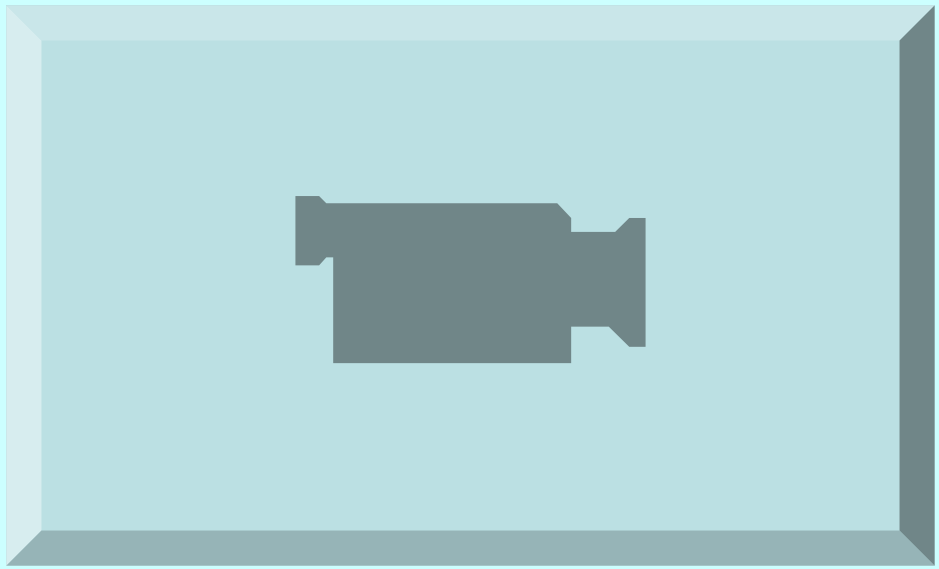
Digitization Information

Digitization Date:	1996
Digitizing Organization:	Carnegie Mellon University Informedia Project

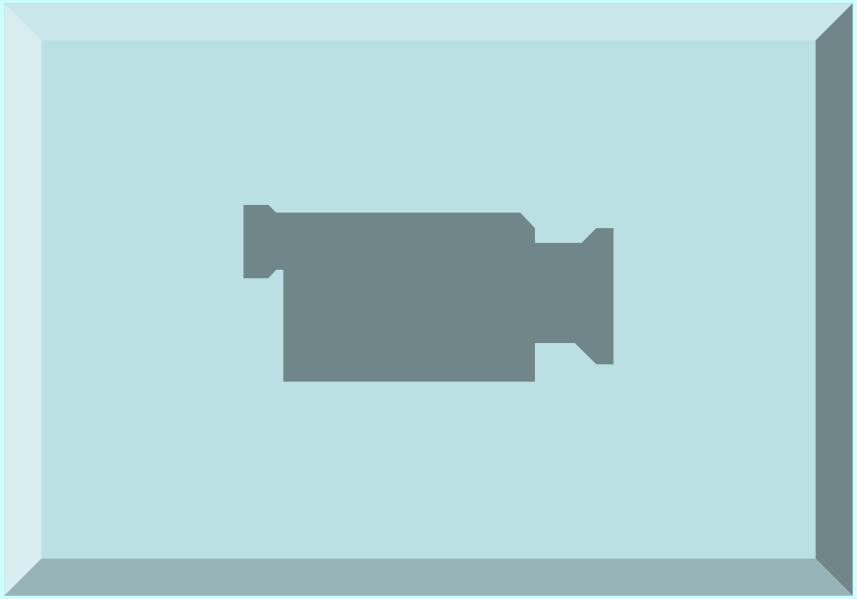
Sample A. 9:19 at 32X



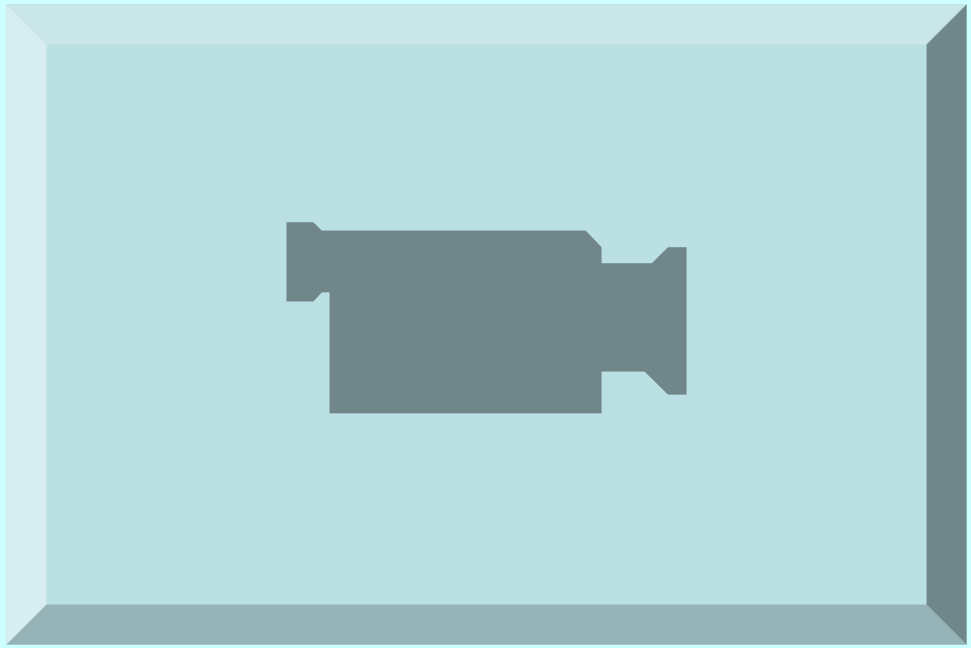
Sample B. 19:48 at 64X



Sample C. 14:00 at 128X

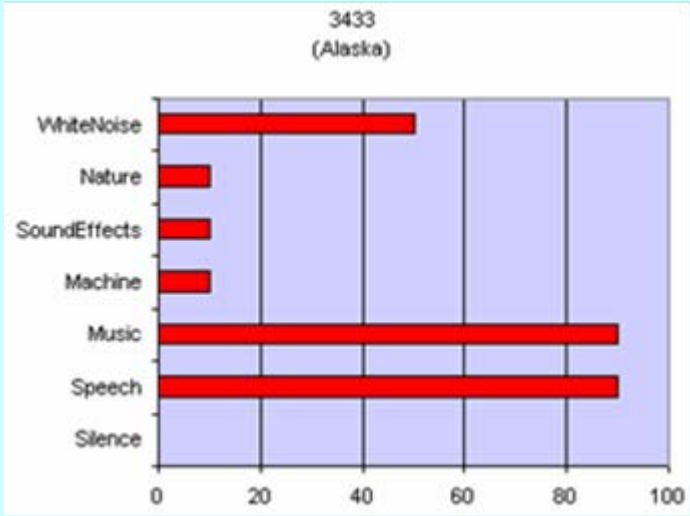


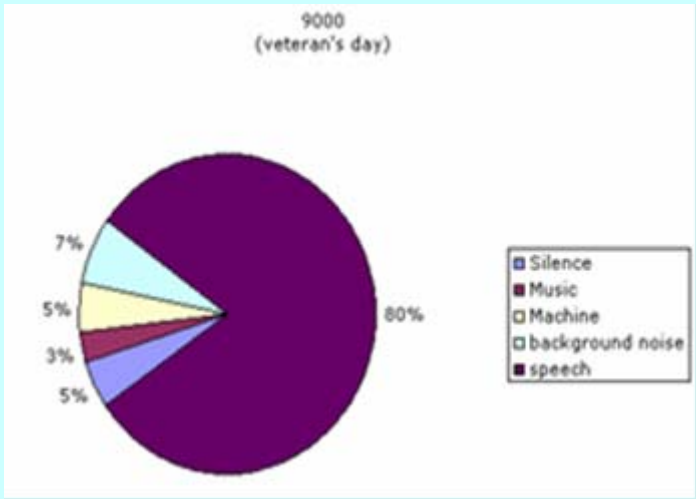
Sample D. 14:09 at 256X

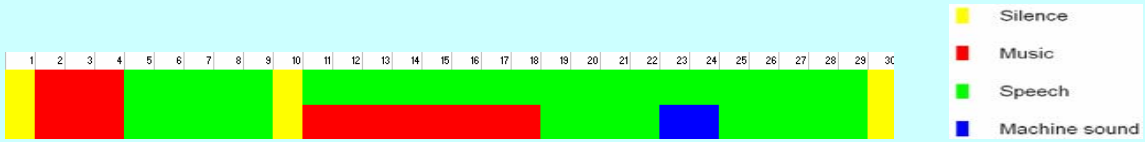


Audio Surrogates

- Spoken descriptions, summaries, keywords
- Visual displays of audio signals
- Audio skims (excerpts)
- Compressed speech
- Parallel streams (cocktail party effect)


3433
(Alaska)
WhiteNoise
Nature
SoundEffects
Machine
Music
Speech
Silence
0
20
40
60
80
100


9000
(veteran's day)
7%
5%
3%
5%
80%
Silence
Music
Machine
background noise
speech


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Silence
Music
Speech
Machine sound


Music
Female voice
Male voice
Kid voice

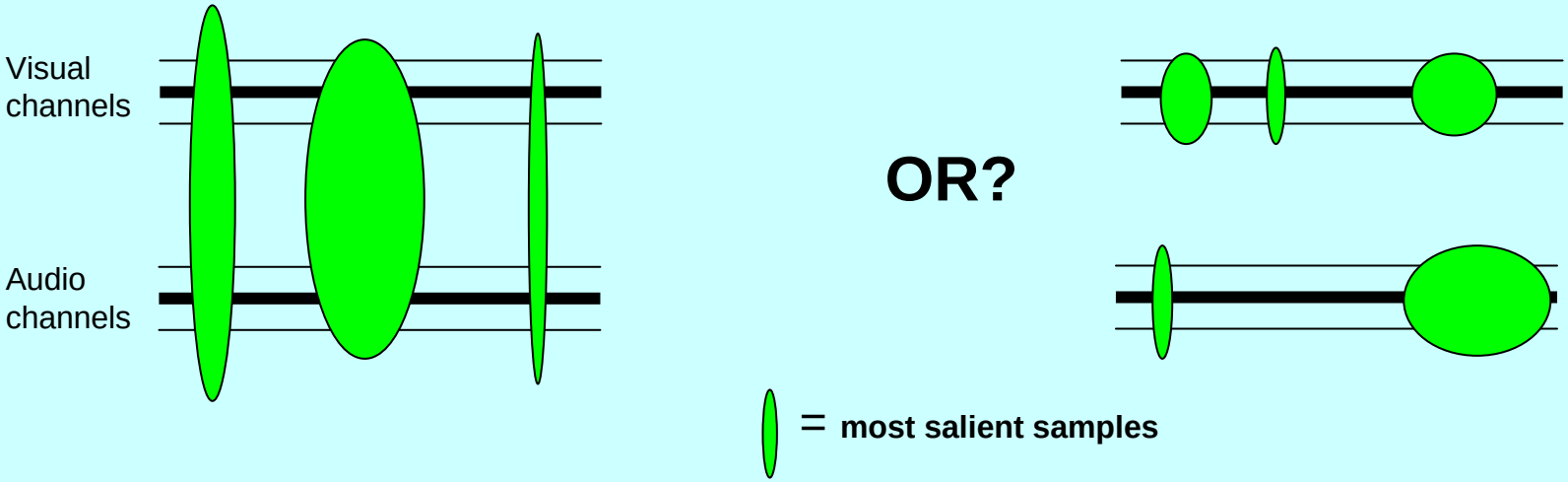
Recent Study (CHI 07)

- 36 participants, within subjects design used audio-only (spoken descriptions), visual-only (storyboards), and combined surrogates to do 5 kinds of recognition and gist tasks.
- Accuracy, time to view, time to complete task, suite of affective measures
- Statistically reliable differences on 3 of 5 accuracy tasks, time to view, and most affective measures. Combined generally better and preferred, audio almost as good as combined, visual alone faster to consume but no time penalties for audio and combined on task completion.
- Implications
  - Add audio surrogates
  - Use audio in small form-factor devices
  - Audio and visual quality important
  - Synchronizing different channels in surrogates may not be necessary
  - User controlled tradeoffs: time, satisfaction, performance

Synchronicity

- Coordinated media channels lead to better understanding, retention, and satisfaction
- What about multi-channel surrogates?
  - Assume surrogate channels should also be coordinated?
  - Perhaps more sense making possible if sampling across different channels and integrating in the head at consumption time rather than pre-coordination at indexing time?
- We have initiated a series of studies

Tradeoffs



Pre-processed integration yields less cognitive load. Less sense making and retention?

User-centered integration (constructivist). More cognitive load. Better sense making and retention due to active participation and ?better? Information samples

Broader Directions: Toward a Theory of Digital Surrogation

- Non-textual tags
  - Photo icons for people on cell phones
  - Audio annotations on digital cameras/phones
  - Geocodes on images (e.g., zonetag on Flickr)
  - Video upload comments on YouTube
  - Avatar characteristics on Second Life
- When do the surrogates become primary?
- When do the surrogates become annotations and annotations surrogates or primary?
- How do we create and use surrogates?

Digital Surrogates are Malleable

Back to the Flickr photo page

Uploaded on January 9, 2007 by Brettjoe

Available sizes: Square (75 x 75) | Thumbnail (66 x 100) | **Small** (158 x 240) | Medium (330 x 500) | Large (676 x 1024)

Download the Small size

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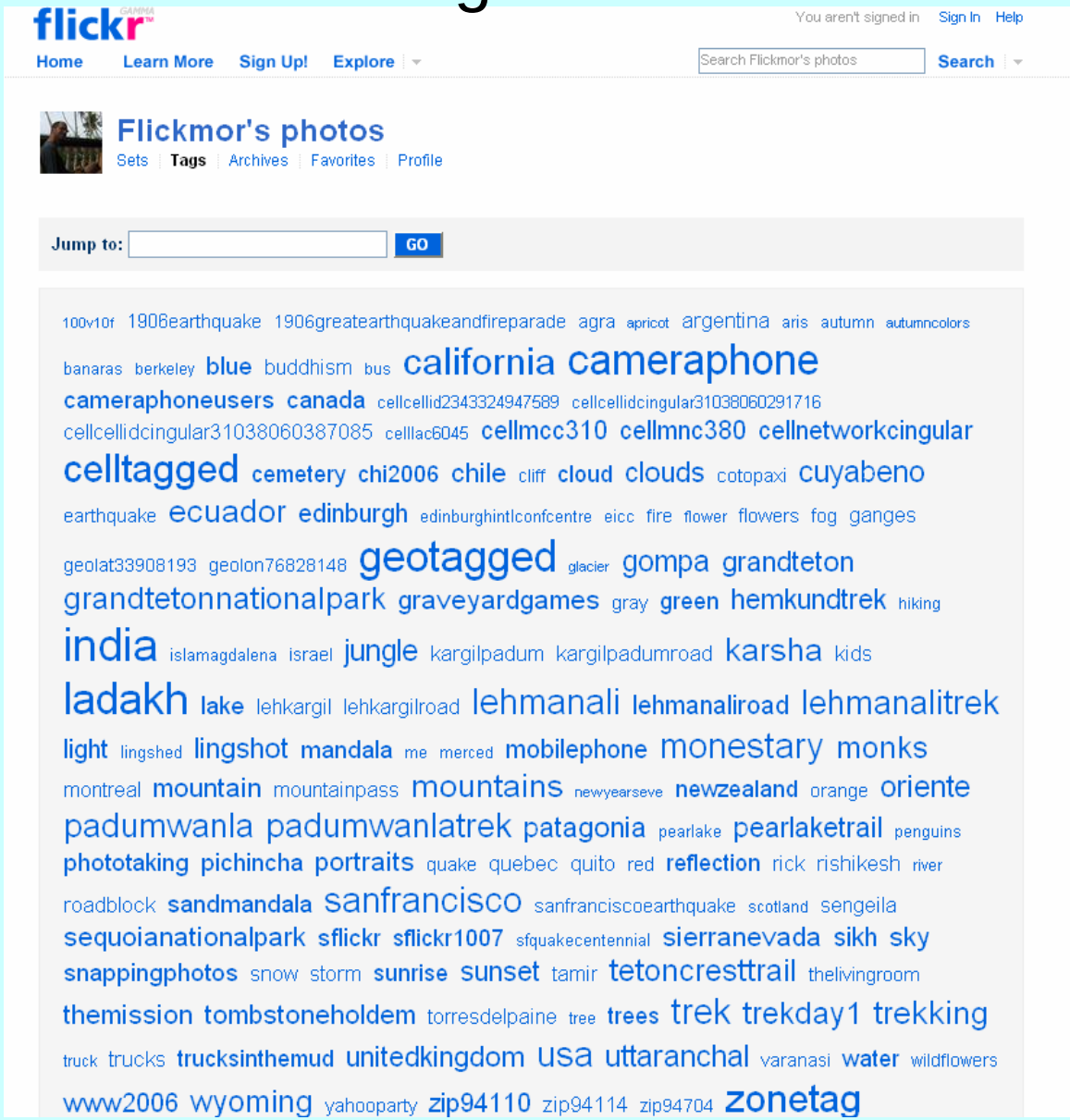
A Surrogate for You?



A Hint of what is to come: YouTube related and responses

- Example 1. U2----------BOA
- **Bank of America sings U2's One http://youtube.com/watch?v=0qAuqq1LFnU**
- **David Cross covers Bank of America guy covers U2 http://youtube.com/watch?v=KC4cn-GleGM&mode=related&search=**
- **Johnny Marr & David Cross - One - Bank of America Cover http://youtube.com/watch?v=nGGChOuCyJk&mode=related&search=**

- **Example 2. Original video: Ninja Assessment http://youtube.com/watch?v=2Ote_x2C6CE**
- **Response: The Twins Watch "Ninja Assessment"http://youtube.com/watch?v=39rEBkyGGi0&watch_response**
- **Response (spam?) Verizon commercial http://youtube.com/watch?v=sQe05PYuzYo&watch_response**

How might we understand this over time (e.g., 50 years)? The challenge of context is digital preservation (NDIIP Project)

Please Don't Tell My Mother

Personal Identity: Your Proflection

- What are the surrogates for you?
- What are your surrogates in cyberspace? (there are more than you might think)
- Proflection as surrogate for self
  - Projection of surrogates into cyberspace
    - Conscious (e.g., your webpage, Facebook profile)
    - Implicit (your click streams, your exoinformation)
  - Reflections of self in cyberspace
    - What others say/link about/to you
      - You are aware or not
    - What machines and algorithms say/link about you and all of your projections and reflections
- A fundamental issue of cyberinfrastructure
  - It is a stimulating and challenging new world for information professionals—the curse of interesting times and the euphoria of life in these times

Q&A

Thanks for your attention and questions

Thanks also to NSF, Library of Congress, NASA, Microsoft, and IBM for partial support of this work