

Flexible Browsing and Searching within Personal Photo Collections

Zwischenbericht Diplomarbeit

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Agenda

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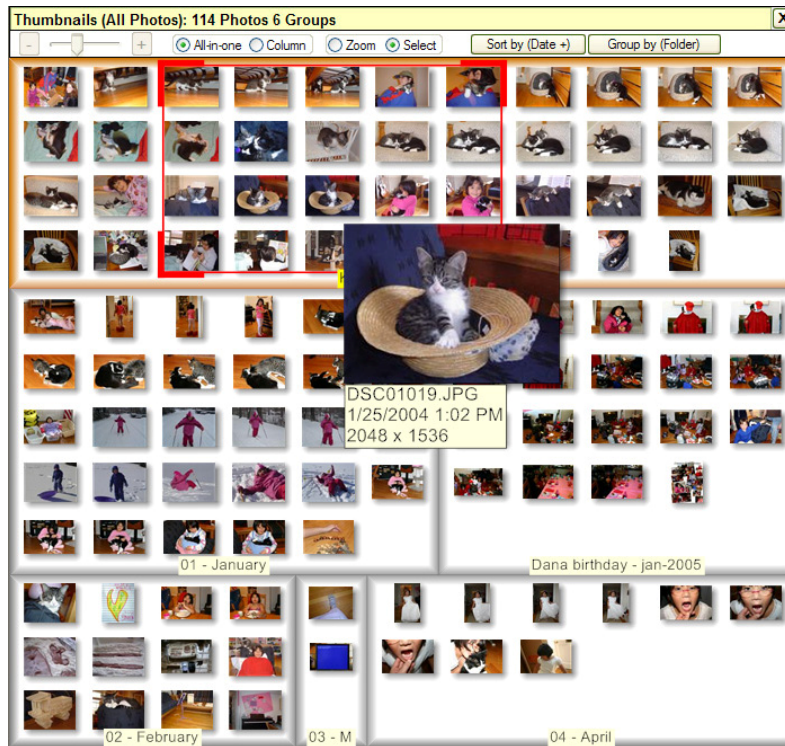
Task

- ≡ A user might always change his mind during searching/browsing. The search goal can be very vague.
 - ≡ --> A flexible user interface is necessary.
- ≡ Most users do not want to learn how to use a complex interface
 - ≡ --> A self-explanatory interface is necessary.
- ≡ Many users do not tag their images, but content-based analysis is not mature enough
 - ≡ --> Automate as much as possible (e.g. event clustering).
 - ≡ --> Let the user tag in a casual way (where it is necessary).
- ≡ Almost every available photo browser relies on the same (grid) layout
 - ≡ --> Explore different layout and interaction styles.
- ≡ Photographs are an emotion-laden subject
 - ≡ --> Playful interaction might be suitable.

Related Work

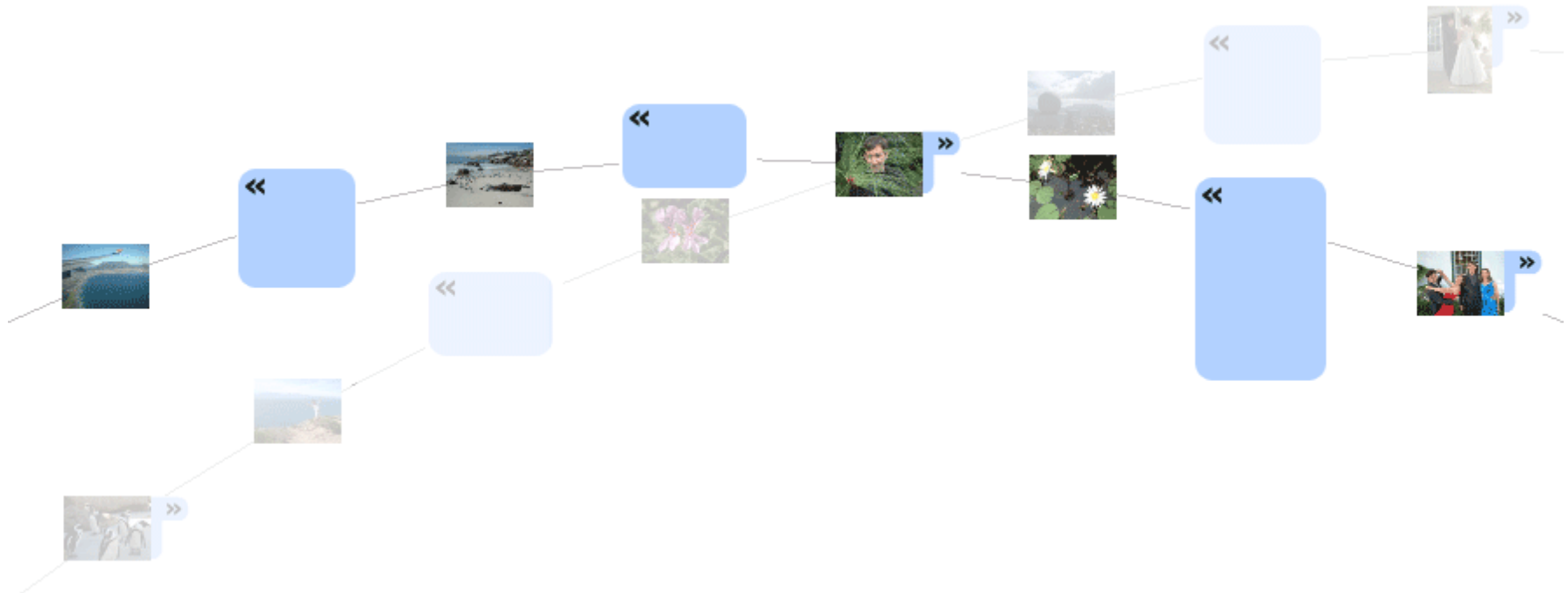
≡ Non-standard photo browsers:

- ≡ PhotoMesa[1]: ZIB, for browsing collections with several thousand images.
- ≡ Chronological order of photographs is not necessarily retained.



Related Work

☰ PhotoArcs[2]: create photo narratives to share with others



Related Work

≡ TimeQuilt[3]: make maximum use of screen real estate while retaining chronological ordering



Related Work

- ☰ Automatically generating image clusters:
 - ☰ Based on photo capture times, detect bursts of images and group these into clusters
 - ☰ Many different algorithms available using:
 - ☰ Only capture time [4].
 - ☰ Capture time and gps-data [5].
 - ☰ Capture time and visual similarity measures [6].

Concept Development

☰ Initial idea:

- ☰ Create a playful interface for browsing personal photo collections.
- ☰ Provide suggestions for related images, in order to find „hidden treasures“.
- ☰ Create a roadmap, showing the way a user took through his collection.
- ☰ Break down the potentially huge photo collection into easily manageable clusters.

☰ Three concepts were developed:

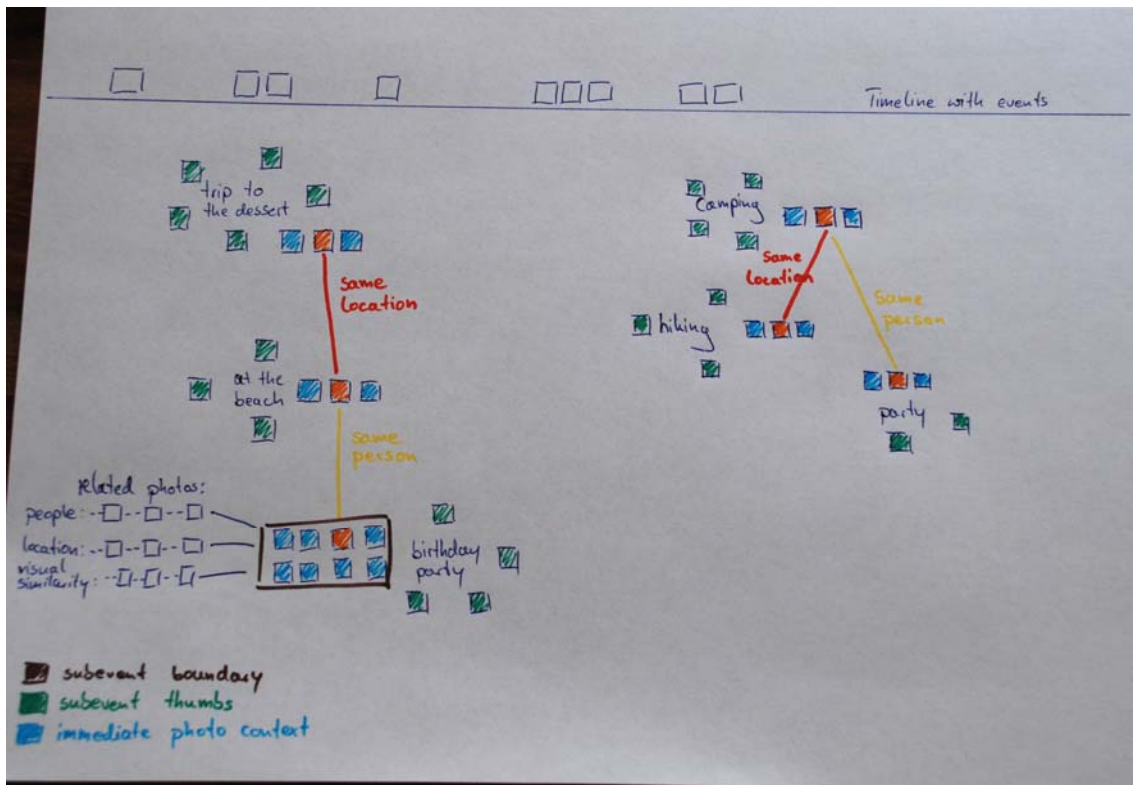
- ☰ Photo Bubbles with roadmap view.
- ☰ Tree Structure Browser.
- ☰ Photo Magnets metaphor.

☰ Conduct a paper prototype evaluation of the concepts.

☰ Refine the concepts based on the findings from the study and test them again.

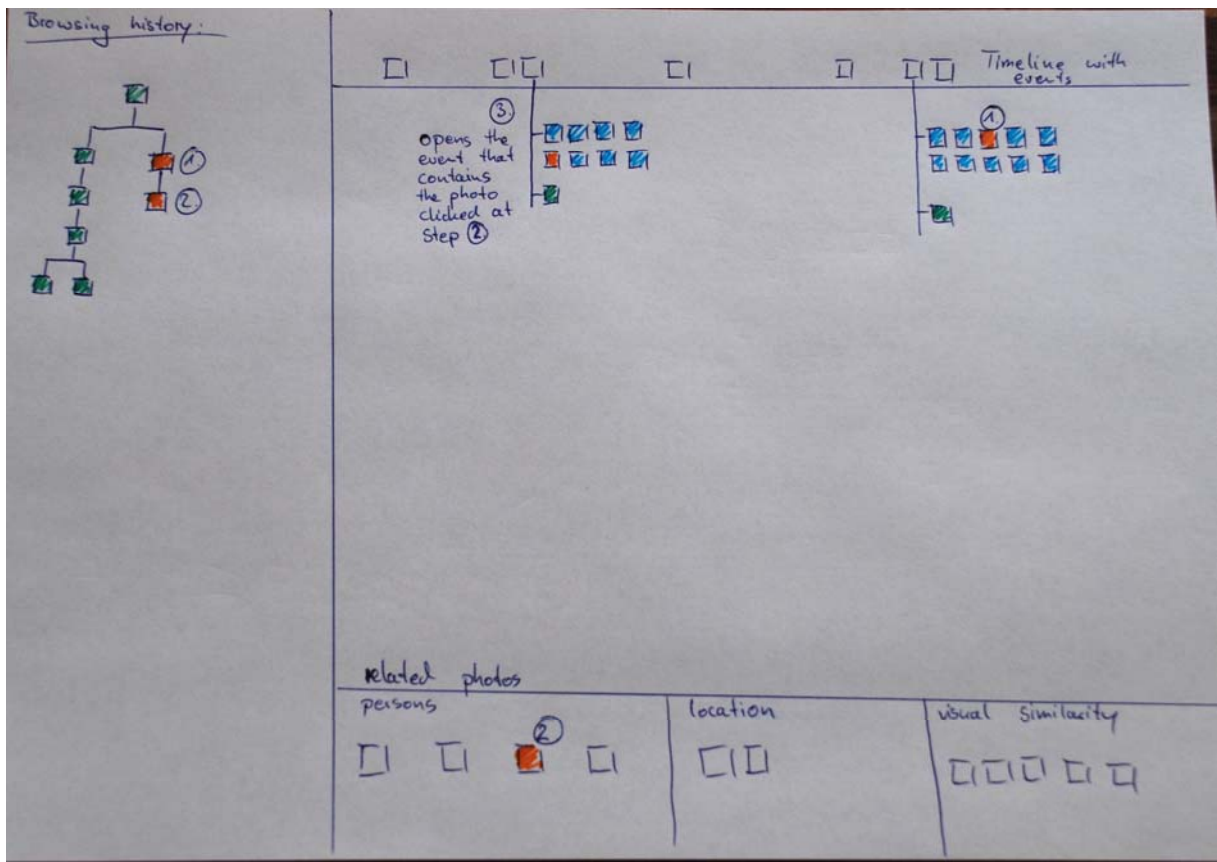
Concept Development Photo Bubbles

- Lines connect the bubbles, acting as a kind of browsing history.
- Selecting an image shows suggestions for related images.



Concept Development Tree Structure Browser

- Similar interaction concept as in Photo Bubbles, but with a more traditional layout.
- Instead of the roadmap view, the browsing history is located in a separate panel.



Concept Development

Photo Bubbles vs Tree Structure Browser

☰ Photo Bubbles Issues:

- ☰ The layout was considered visually pleasing.
- ☰ Connecting lines were confusing for some users if the connected events were not related logically.
- ☰ About 60% of users preferred to have the browsing history in a separate panel.

☰ Tree Structure Browser:

- ☰ The layout was considered more structured than in Photo Bubbles.
- ☰ The browsing history view was considered very useful.
- ☰ No serious issues were detected.

☰ All users liked the idea of showing related images in both concepts.

Concept Development

Refining Photo Bubbles

- ≡ Based on the findings of the first set of user tests the Photo Bubbles concept was refined.
- ≡ The roadmap view was discarded. Instead a separate panel was used for the browsing history.
- ≡ Dragging events from the timeline to the main view was added, in addition to just clicking.
- ≡ Sub-events can now be collapsed and expanded in order to focus on single events.
- ≡ Survey Results before refinement (N=8):

	Ease of use	Like the concept
Photo Bubbles	3,38	2,88
Tree Structure B	4,38	3,36

- ≡ Survey results after refinement (N=9):

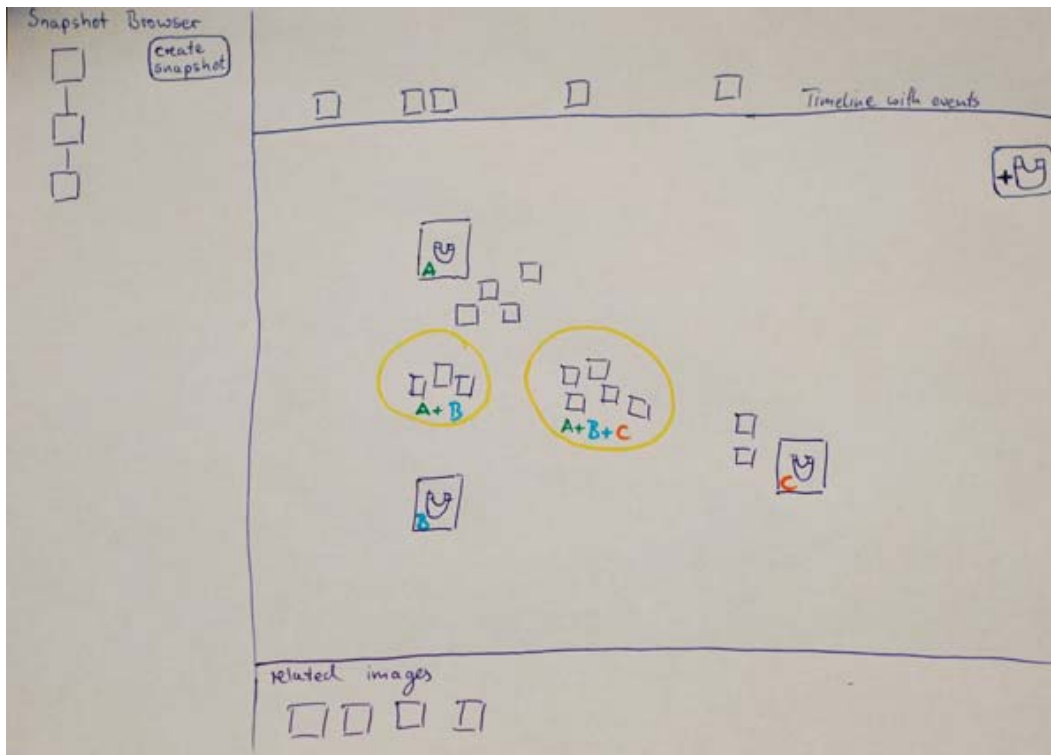
	Ease of use	Like the concept
Photo Bubbles	4,22	3,44
Tree Structure B	4,67	2,78

Concept Development

Photo Magnets

Refining the concept:

- Magnets can be dragged over the timeline in order to select images from events.
- Snapshot Browser added.
- Default magnet layouts are provided, to give the user a starting point.



Concept Development

Overall Results

☰ Results from the first set of the study:

	Ease of use	Like the concept
circular layout	3,38	2,88
hierachical layout	4,38	3,63
magnet metaphor	2,75	3,38

☰ Results from the second set of the study:

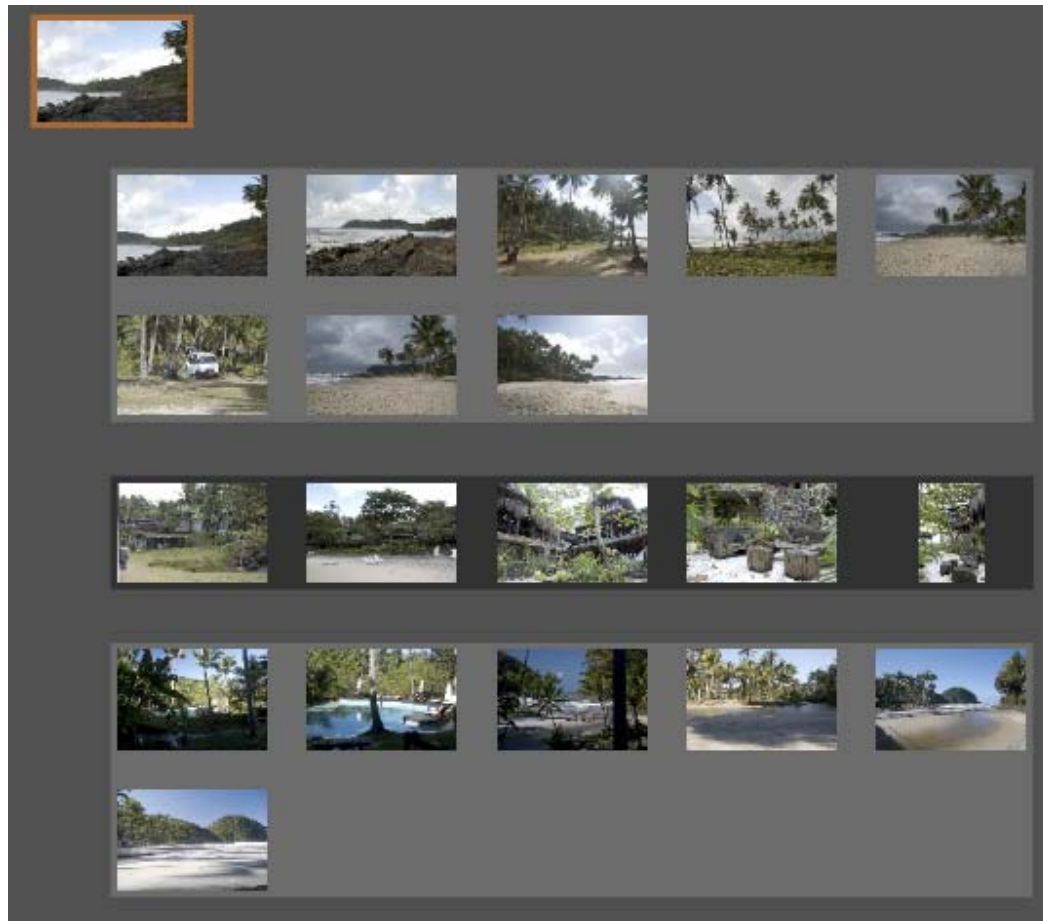
	Ease of use	Like the concept
circular layout	4,22	3,44
hierachical layout	4,67	2,78
magnet metaphor	3,89	4,67

General implications from the study

- ≡ More than 50% of the users used the Windows Explorer for photo browsing.
 - ≡ None of these users missed more sophisticated features.
- ≡ Almost 90% of users organize their images in a folder structure by events.
- ≡ About 2/3 of users change events during browsing at least sometimes.
- ≡ About 40% of users want to have an overview of their complete collection (grid).
- ≡ 60% of users think having statistics on their collection might be a nice feature.

Current State

Automatic event clustering and manual refinement of these clusters: finished



Current State

☰ Timeline view: currently being developed



What's next?

- ≡ Conduct another paper prototype study with professional photographers to find out if their requirements differ from those of amateur users.
- ≡ Implementation.
- ≡ Conduct an evaluation of the three concepts in comparison to an existing system.

Literature List

- ☰ [1] B. B. Bederson, PhotoMesa: A Zoomable Image Browser Using Quantum Treemaps and Bubblemaps
- ☰ [2] L. Ames, M. Manguy, PhotoArcs: A Tool For Creating And Sharing Photo-Narratives
- ☰ [3] D. Huynh, et. al., TimeQuilt: Scaling Up Zoomable Photo Browsers For Large, Unstructured Photo Collections
- ☰ [4] A. Graham, et. al., Time as Essence for Photo Browsing Through Personal Digital Libraries
- ☰ [5] M. Naaman, et. al., Automatic Organisation For Digital Photographs With Geographic Coordinates
- ☰ [6] M. Cooper et. al., Temporal Event Clustering For Digital Photo Collections.