
Autobiographical Visualizations: Challenges in Personal Storytelling

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Abstract

The extensive digital archives of personal data that we collect over the period of a lifetime can support new ways of autobiographical storytelling. *Autobiographical visualizations* are visual representations based on these repositories that can be used to share important life experiences with others. The focus on storytelling is different from other personal informatics applications that mainly aim for self-reflection. This workshop paper discusses the distinct challenges for the design of autobiographical visualizations: the integration of multiple data sources, personalization, self-explanatory representation and privacy aspects. We further outline suggestions for approaching these challenges.

Author Keywords

Autobiographical visualizations, storytelling, personal informatics, visualization, reminiscing

ACM Classification Keywords

H.5.m [Information interfaces and presentation (e.g., HCI)]: Miscellaneous.

Introduction

As our lives are shifting towards the digital, personal data collected over a lifetime opens up new possibilities to paint a detailed picture of a person's biography. Extensive

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digital archives of chat histories, emails, music listening histories or calendars as well as explicit life logging tools and wearable sensors capture various aspects of people's lives in highly detailed form. The field of personal informatics has discovered these rich data repositories for self-reflection and reminiscing. But the data also holds great potential for the support of storytelling and the sharing of personal life experiences with others. The popularity of social networks shows that there is great interest in sharing life experiences. However, current platforms are limited in their expressiveness as most of them only support posting short text messages, photos and links. Visual representations can reveal stories within large amounts of data and have the potential to become powerful tools for data-based storytelling [4]. A popular example is the Feltron Annual Report¹ that shows statistics about designer Felton's life. However, the creation of such personal and detailed visual autobiographies involves a tremendous amount of manual work in the data collection process as well as in the design of the representations — more than most people want to invest. In the following we discuss challenges in facilitating the creation of expressive autobiographical visualizations. We also provide an overview of approaches that address these challenges.

Autobiographical Visualizations

Autobiographical visualizations are visual representations of personal life experiences based on life logs from a variety of sources for the purpose of storytelling. This focus on communication is different from other personal informatics tools that often go for a holistic image for personal use. The distinct requirements of autobiographical visualizations are influenced by the **tasks** they support, their **audience** and the **data** they represent.

¹<http://feltron.com/>

The main **task** of autobiographical visualizations is to convey stories of personal life experiences and share them. Visualizations for autobiographical storytelling thus do not aim at supporting a detailed analysis of personal behaviours. Instead, they are used as personal artefacts that reveal a story about the history of an individual. Hence, they serve as props for storytelling and social sharing of personal memories.

Just as other media, visualizations for autobiographical storytelling need to carefully consider their **audience**. They can serve as a diary solely for private reminiscing but can also be used as artefacts to share with family members, friends, co-workers, or even publicly (e.g. the Feltron Annual Reports).

While the **types of data** that can be visualized for autobiographical storytelling are diverse, data that sheds light on actions, thoughts, emotions and life events are of particular interest. Manually collected data, such as status updates on social networks and calendar entries often express subjective autobiographical relevance for the collector. Automatically collected data, however, provides a more objective overview of a life. Huge potential for autobiographical visualization lies in communication data, such as email-archives or chat histories (e.g., [3, 5]). Finally, combining data from different sources can lead to a holistic picture of a person's history.

Challenges & Design Goals

To be able to convey an individual's personal history, autobiographical visualizations need to come close to the actual memories and support storytelling and social sharing. The distinct characteristics of autobiographical visualizations result in the following challenges for their design and development:

Integration. A challenge in the design of autobiographical visualizations is to combine data from different sources. Actual autobiographical memories contain diverse aspects of life-time periods, such as knowledge about other people, activities, locations, feelings and thoughts [2]. Information about these aspects can be found in digital archives that are spread over separate applications and services (IM, email, photo applications, social media, etc.) which have to be merged.

Personalization. Similar to diaries and photo albums, autobiographical visualizations can paint a much more unique picture of a person's past if the end product is influenced by this person. Tools should provide the necessary freedom to make them personal artefacts instead of automatically created dashboards. That includes adaptability of the design, content and representation. Opportunities of highlighting personally relevant aspects and adding or removing specific data items account for the subjective weighting of autobiographical memories that is missing from automatically logged data.

Self-reliance. To be suitable for a wider audience, autobiographical visualizations should be able to stand alone and be interpretable by people without prior knowledge of the experiences that are represented. This is in contrast to visualizations for reminiscing (e.g. [1, 3, 5]: Here, the intended audience (i.e. the collector of the data) has additional contextual information about the represented history from his/her own memory.

Privacy. When sharing sensitive information about a person's life experiences, flexible control of the amount of visible information is required. While visualizations for private reminiscing aim to provide as much insight in the underlying data as possible, visualizations for sharing

autobiographical stories should reveal exactly the information that is intended by the storyteller. This is particularly important as the audience can be very diverse. The details that we want to show to our partner and family can be quite different from what we want to share with co-workers or even the general public.

Approaches

Some recommendations for approaching these challenges can be borrowed from other narrative visualizations and personal informatics systems for self-reflection, although these scenarios do not deliberately support autobiographical storytelling. The following list of suggestions aims to provide a starting point for designing autobiographical visualizations for personal storytelling:

Customization. Customizability includes options for controlling design parameters, content or visualization techniques. Being able to adjust the look and feel of visualizations (e.g., color schemes and fonts) makes them expressions of peoples' personalities [6]. Choosing a suitable representation (see e.g. [7]) and adding missing data from one's own memory accounts for the subjectivity of autobiographical memories (\rightarrow *Personalization*). Control over the content (e.g. removing certain data items) is also essential regarding *Privacy*.

Annotations. Annotations can provide additional background information about the represented life experiences and support personal comments by the author. Messaging (i.e. enriching visualizations with textual information) is an important feature of narrative visualizations in general [4]. Additional information enhances *Self-reliance* and can facilitate interpretation. Furthermore, personal comments can contribute to the visualization's *Personalization*.

Multiple Links. Regarding *Integration*, the use of temporal, social and location-based connections are suitable as these are attributes of the data as well as of actual autobiographical memories [2]. Timestamps are common in most data formats and hence often used to connect different types of data (e.g. in LastHistory [1] or Memolane²). Social relations can be retrieved by identifying people via text mining [3] or face recognition (e.g. in Apple's iPhoto). Some representations also use GPS data or text mining to identify places and organize information based on their location e.g. the map view in Facebook's Timeline or Apple's iPhoto.

Flexible Amount of Detail. Autobiographical visualizations should provide an overview of the underlying data and give the storyteller control over the amount of detail that is available on demand. Techniques such as restricting the maximum zoom level in zoomable interfaces or using aggregations of data items make the visualizations adjustable for different intended audiences. In this way, people can share autobiographical visualizations that are based on sensitive personal information (e.g. chat and location histories or emails) with others without having to reveal data that they want to keep private (→*Privacy*).

Conclusion

We presented the challenges of *integration*, *personalization*, *self-reliance* and *privacy* in visualizing personal data collections to support autobiographical storytelling. To approach these challenges we suggest *customization*, *annotations*, *multiple links* and a *flexible amount of detail* as design recommendations. In the future, the potential of autobiographical visualizations will

grow with the richness and detail of personal data we collect. Consider how our experience of the lives of our great grandparents can only be based on black and white photographs, letters and verbal anecdotes. Our descendants will be able to gain a much clearer picture of the world that we live in today, based on the data we amass over a lifetime. Autobiographical visualizations offer a new way of conveying a vivid picture of our lives by portraying the personal way we see the world.

References

- [1] Baur, D., Seiffert, F., Sedlmair, M., and Boring, S. The streams of our lives: visualizing listening histories in context. *IEEE Trans. Vis. Comput. Graphics* 16, 6 (2010), 1119–1128.
- [2] Conway, M. A. Sensory-perceptual episodic memory and its context: autobiographical memory. *Phil. Trans. R. Soc. B* 356, 1413 (Sept. 2001), 1375–1384.
- [3] Hangal, S., Lam, M. S., and Heer, J. Muse: Reviving memories using email archives. *Proc. UIST* (2011), 75–84.
- [4] Segel, E., and Heer, J. Narrative visualization: telling stories with data. *IEEE Trans. Vis. Comput. Graphics* 16, 6 (2010), 1139–1148.
- [5] Viégas, F. B., Boyd, D., Nguyen, D. H., Potter, J., and Donath, J. Digital Artifacts for Remembering and Storytelling : PostHistory and Social Network Fragments. In *Proc. HICSS* (2004).
- [6] Viégas, F. B., Wattenberg, M., and Feinberg, J. Participatory Visualization with Wordle. *IEEE Trans. Vis. Comput. Graphics* 15, 6 (2009), 1137 – 1144.
- [7] Viégas, F. B., Wattenberg, M., Ham, F. V., Kriss, J., and Mckeon, M. Many Eyes : A Site for Visualization at Internet Scale. *IEEE Trans. Vis. Comput. Graphics* 13, 6 (2007), 1121–1128.

²<http://memolane.com/>