
Visualizing Media and Music Histories

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Abstract

With media consumption becoming purely digital, monitoring one's personal activities in this regard is getting easy. Visualizing this data can lead to insight not only into personal behavior: We argue that we can look at multiple media histories from three different perspectives: Item-centric, Spatial-Temporal and Social. In this workshop paper we discuss these three perspectives and activities related to media histories and present preliminary results for visualizing music consumption.

Keywords

Media, music, consumption, histories, visualization

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

The recent upswing of personal informatics is in part due to services like Last.FM¹ that allow tracking one's own music consumption effortlessly. As more and more types of media move into the electronic domain, such auto-logging can be expected to become commonplace even for formerly printed media like magazines and books. In the end, complete personal media histories

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¹ <http://www.last.fm>

will be available without any monitoring effort from the user's side.

What's in a media history?

Accurate and effortless tracking gives users a perfect memory of their own media consumption. The various advantages of having such information fall into three categories:

- *Look-up*: Media histories can serve as diaries that let people keep track of their media consumption and retrieve favorites from certain time periods.
- *Pattern Recognition*: Beyond pure look-up, media histories allow seeing overarching patterns that might not be visible on the usual day-to-day basis and help tracing one's own development.
- *Recommendation*: Finally, the combination of multiple histories can help in recommending new items or people to users.

To make sense of them, media histories can be seen from three different *perspectives*: First of all, as time and place can be easily tracked and are central to our understanding of the world, the *Spatial-Temporal* perspective lends itself to sorting items (especially for user-generated content like photos) and finding overarching patterns. Looking at media consumption from an *Item-centric* perspective lets one learn about the user's behavior regarding one specific item, similar items for the same media type or other types and the general popularity of an item. But this social aspect is so important that it also works as another perspective:

From a *Social* point of view, we can compare user histories and look for overlaps or discrepancies along the *Spatial-Temporal* and *Item* dimensions. This comparison can happen for pairs of users, circles of friends or family or whole communities (given the data is available). Correspondingly, we can find clusters of users that are similar in their temporal or item patterns without necessarily knowing each other.

Related Work

Last.FM's service entices users with providing discovery of relevant new music, but also of people with a similar taste (neighbors). The Last.FM user community has created many visualizations and tools for accessing and making sense of listening histories (most can be found at <http://build.last.fm>). A popular example are Stacked Graphs [2] that give a high-level, non-interactive overview of a history.

Visualizing histories is a common task for information visualization in general, but previous work either focused on other types of data (e.g., chat conversations [4]) or followed a very general approach (e.g., LifeLines [3]) without taking special aspects of the underlying data into account. Most life logging services such as Daytum² provide rudimentary graphs and visualizations to communicate data but not to analyze it thoroughly.

Visualizing music histories

Through Last.FM, music histories are readily available which made them an ideal target for an initial exploration into visualization for this type of data (with enough data available for covering all three

² <http://www.daytum.com>

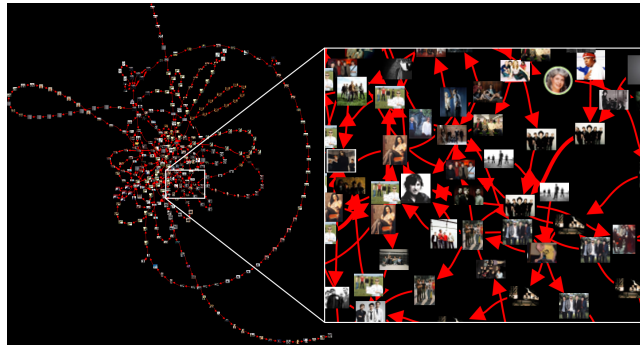


Figure 1 – Item-centric listening history in the *Tangle* perspectives). Relationships across different types of media (cross-media) are harder to visualize due to the lack of monitoring services and the subsequent lack of data.

Listening histories in themselves are already very complex: Item-centric connections between songs exist on various levels, from obvious ones like sharing the same artist or album to more obscure ones like being written in the same key or the same city. In addition to that, the user's personal background and experience with music are relevant but (mostly) completely inaccessible for any visualization. Diving into such depths is therefore costly, so it is a better strategy to present the information undistorted and leave the interpretation to the user.

Strings & Tangle

In a first approach we applied information visualization techniques to a single listening history, once from an item/song- and once from a temporal perspective [1].

The *Tangle* visualization uses a node-link diagram where nodes represent unique songs (see Figure 1). If two songs were listened to one after another, an edge between the two nodes is created. The force-directed layout causes popular songs with many edges to be drawn towards the center while less-connected songs form arcs or loops at the fringe. The user is able to interactively investigate neighborhoods of single songs by dragging them with the mouse.



Figure 2 - Sequences of songs in *Strings*

From a time-centric perspective, it makes sense to separate the history into self-contained sequences (based on the pause between them). The *Strings* visualization (see Figure 2) sorts these sequences and displays them along a calendar axis, thus uncovering patterns in time. By zooming and panning the user is able to navigate and explore the history. To amend the problem of unique songs appearing multiple times, the *Strings* visualization draws yellow arcs between them.

Strings and Tangle support Pattern Recognition and Look-up tasks, but focus on a single user and thus fall short of the social aspect.

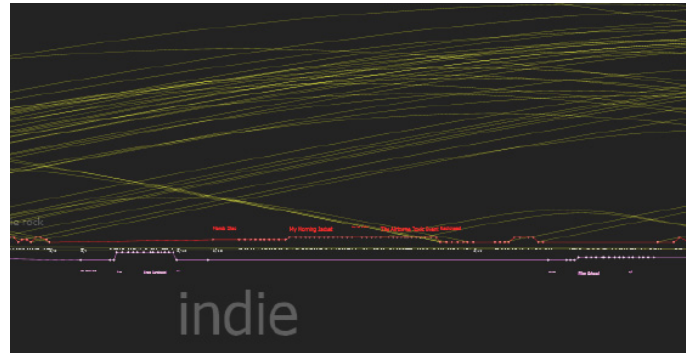


Figure 3 – Two listening histories in *LoomFM*

LoomFM

For the *Social* perspective we developed *LoomFM*, a zoomable user interface for comparing two listening histories temporal- and item-wise (see Figure 3). Both histories are aligned with a horizontal calendar axis, with one above and the other below (red and purple). Single songs are represented as circles that come closer to the central timeline or move further away depending on how related they are to the other history. When two or more subsequent songs share the same artist or genre, the corresponding label is enlarged, thus providing an overview of popular artists and genres at the highest zoom-level. Similar to *Strings*, identical songs throughout both histories are connected with yellow arcs, showing connections but also long-term behavior: High and wide arcs mean that the user listens to songs repeatedly (User Red in Figure 3), while small or no arcs mean that songs appear only once in the history.

Conclusion

In this paper we discussed possible benefits from and perspectives on logging media histories. We further presented visualization approaches from our work with listening histories. Currently, the lack of data for other types of media limits our efforts for cross-media visualizations, but we are working on integrating new services and thinking about what a general media tracking service might look like. Also, the item-centric perspective is, as we mentioned for listening histories, very complex and the question still stands how to effectively present the various underlying relationships.

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