

## New Insights: Dynamic Timelines in Digital Humanities

Kurt Fendt, HyperStudio, Massachusetts Institute of Technology

Organizing historical events as a function of time dates back to the 2<sup>nd</sup> century AD but it took until the mid 18<sup>th</sup> century for timelines to appear in a form that we would recognize today. Jacques Barbeu-Duborg's *Carte chronologique* was among the first timelines to organize events along horizontal and vertical axes but required extensive explanation even for scholars to appropriately interpret the graphical representation of time. Compared to chronological lists of events, timelines have a number of advantages: They visually represent correlations between events so that users can quickly identify patterns in temporal data that would be difficult to discern otherwise; they provide quick access to temporal information in the context of simultaneous events over a large time span; they combine and correlate events and information from multiple sources. Digital timelines however – despite their technical issues in deploying them on the web – have the potential to provide much more than mere information visualization. Due to the fact that it is a synthetic object intended to highlight context and details that reside elsewhere, a digital timeline can offer a process for collaborative engagement rather than just a finished artifact representing one authorial view. Especially in close integration with digital humanities tools that foreground scholarly collaboration and sharing as well as other visual data representations such as maps or faceted browsers, timelines can offer new insights and allow scholars to explore new forms of inquiry in a shared environment. This talk will rethink digital timelines as collaborative tools for scholarly engagement, taking into account research in Computer Science especially on Semantic Web technologies as well as Artificial Intelligence and provide prototype implementations for Political Science, Literature, and as an open, "crowd-sourcing" tool.

In a recent report for MIT's HyperStudio, Historian and Digital Library Specialist, Christopher York, provided a typology of digital timeline uses. It provides a useful set of criteria for analyzing existing timeline tools and for measuring new approaches for representing time-based data.

Rhetorical	Present a reasoned argument in temporal format
Situational	Compare two contrasting interpretations of a milieu
Information foraging	Locate specific information by navigating through contextual clues
Analytic	Use visualizations to expose unforeseen patterns in temporal data
Constructivist	Note-taking devices that organize information temporally
Indexical	Provide quick ordered access to many items, like a card catalog
Aggregate	Serves to combine and correlate information from multiple sources
Discrete	Uses events that are localized in space and time, not hierarchical
Focus + Context	Foreground discrete events, situated in a larger interpretive context

(Christopher York: Digital Humanities Timelining Report, MIT HyperStudio, 2009)

In a first step, this talk will provide a critical comparison of existing digital timelining tools and approaches geared for the humanities. Tools such as Simile's Timeline or George Mason University's Center for History and New Media "Timeline Builder" are adaptable to a number of different timelining approaches and effectively communicate a rhetorical argument. While having sparked many new uses of timelines, both Simile's Timeline and George Mason's Timeline Builder primarily represent the view of a single author. They cannot easily be adapted to an ongoing research process in which relationships to other events or data can be changed dynamically or even permit the co-construction of timelines as part of a collaborative research

process. Timeline applications developed for other domains such as Ben Shneiderman's Catherine Plaisant's Lifelines project at Maryland's Human-Computer Interaction Lab or University of Southampton's Continuum Timeline provide important insights into rethinking dynamic visual interaction with timelines.

An extended notion of timelining as a collaborative activity might include the following modes:

- Group authorship. Two or more users have permissions to edit the same timeline.
- Shared corpora. Many users contribute source files, often through a process of distributed textual editorship, which are then aggregated into timelines.
- Open revision. Like some wikis, a timeline tool might choose an "open-doors" editorial policy, and allow anyone to do edits on any timeline.
- "Crowdsourcing." Users in a community create timelines for their own purposes and use (e.g. in a history class), and shared timelines are generated from their most significant events.

The second part the talk will exemplify these collaborative modes by presenting three approaches to timelines within shared research environments for digital humanities. They are part of ongoing research projects at MIT's HyperStudio.

The "US-Iran Relations - Missed Opportunities" project, developed in collaboration with MIT's Center for International Studies and partners at Brown University's Watson Institute and the National Security Archive in Washington employs a flexible timeline to display political events that are core to the understanding of the relationship between the two countries. Using the timeline as a starting point, scholars can search and filter an extensive archive of declassified US documents, rare documents from Iranian sources as well as information on key political players and institutions. In this project the timeline functions as a focal point for the collaborative interpretation of political events from both an American and an Iranian point of view.

Through a flexible, interactive timeline linked to a faceted browser and full facsimiles of original installments, the "Serial Experience" project, developed in collaboration with MIT's Literature Faculty, students and scholars can explore Victorian serial novels as overlapping, time-based works of art in conversation with their audience and neighboring texts and thus experience Victorian serials as both a publication phenomenon and a reading experience. In addition, users may collect and annotate novels into their personal library; subscribe to and receive novels along their original publication schedule; and join reading groups to collaboratively read and discuss the novels as serial publications. Through the innovative integration of a timeline tool, the project creates a unique space in which users can read Victorian serial novels as a shared experience.

Finally, "Emergent Timeline" is an exploratory project that allows users to co-create timelines as a series of shared events that can be commented, tagged, and critiqued in multiple ways. Overlapping events in different users' timelines are offered as points of collaboration thus fostering the "crowdsourcing" of a growing number of timelines of mutual interest. This project provides a novel approach to the idea of co-constructing timelines and builds on an evolving body of shared interpretations of time-based data.