Reviews for jovi-2024-vancisin-provenance

Review #1

Completed: 22-07-2024 01:49

Recommendation: Accept Submission

Conflict Declaration

I declare that I have no known conflicts of interest with the authors.

Review

The paper discusses a qualitative review of a visualization prototype applied to the digital humanities context. A visualization approach to this scenario is helpful because digital humanities often require the combination of physical artifacts and virtual metadata. Creating a system that manages both of these aspects would be valuable, and the paper discusses some qualitative perspectives on the potential for an interface to provide exploration entry points and easy understanding. The paper is well motivated with a specific data set to be explored as well as a case study that describes why the work needs to be done. The visualization emphasizes the transformations made to the data set over time, and it is evaluated by experts from the humanities as well as HCI fields. This work presents a valuable case study for future provenance visualization design research to consider.

Concern: Strong distinctions between humanities' and sciences' approaches **Location**: Section 2 especially, but throughout. **Severity**: Suggestion I am uncomfortable with the distinctions between the "humanities" and the "sciences." While I understand the necessity of this distinction for the narrative, I think it could be presented in a more inclusive and open-minded manner. While there is some truth about how provenance serves different purposes in different disciplines, it is not strictly this distinguished. My understanding of the etymology is that provenance is a term originally used in the humanities specifically to track the showing of art pieces in galleries. The term was then adopted by database scientists to describe changes made to data as it evolved and changed. The term has evolved and been expanded by Human-Computer Interaction researchers to describe how many time-related concepts can be visualized and better presented to humans. My main complaint with this approach is that there are flavors of provenance research that are not included in the distinction made. In my research, I study how to report analysis processes based on user interactions automatically. I do not know if my research falls into the author's definition of "science" research because it is not about transparency or replicability but more about communication

and collaboration. The main goal of my work is to improve efficiency and maximize individual talents by presenting only the relevant information to the people who need it. **Solution**: Perhaps consider reducing how clearly you distinguish the activities of these two groups by adding caveats that describe the definitions you are using in the paper and leaving room for others to have different definitions. I would like to see language like "in this work, we define humanities provenance as:"which we distinguish from scientific provenance because," "For the sake of scientific communication, we contrast our approach with the traditional approaches of humanities and science communication."

Concern: Lack of Researcher Reflexivity **Location**: Section 5.4 (new) Reflexivity **Severity**: suggestion Although the researchers provide a description of the thematic analysis they conducted, the manuscript lacks a section discussing the researchers' reflexivity. Reflexivity is a helpful discussion to communicate to readers about potential biases and perspectives that may have influenced the research process and data interpretation. **Solution**: I recommend including a "Researcher Reflexivity" subsection. This section could provide an account of the researchers' backgrounds, experiences, and any potential biases they bring to the study. Including these details will enhance the transparency and credibility of your study by allowing readers to understand the context within which the research was conducted. Consider discussing the following aspects:

1. **Personal Background**: Share relevant personal and professional experiences that may have influenced your perspective on the research topic.
2. **Relationship to Participants**: Describe any relationships or prior interactions with the study participants that could affect the data collection or interpretation. This is partially done with the Astriks next to quotations but could be made more explicit when discussing how participants were recruited (Section 5.1).
3. **Positionality**: Reflect on your position in relation to the research topic and participants, including any power dynamics at play.
4. **Biases and Assumptions**: Acknowledge any preconceived notions or assumptions that may have shaped the research design and analysis.
5. **Impact on Research**: Discuss how these factors influenced the research process, qualitative analysis, and the steps taken to mitigate their impact. For further guidance, you might refer to resources such as "Reflexivity: A Practical Guide for Researchers in Health and Social Sciences" by Linda Finlay and Brendan Gough.

Concern: Possible comparison between naïve and experienced users' reactions to the visualization **Location**: Section 7.4 (new): Themes between different user experiences. **Severity**: suggestion I see an opportunity to compare the reactions of those who were naïve to the prior visualization approach and those who had an experience with the visualization described in [43]. While this is not necessary for a case study of your visualization approach, I think you have set up a nice context for comparison. I would imagine (and based on what I read in the paper itself) that those who had been exposed to the original geographic visualization would have different comments about this providence representation compared to those who had never seen it. **Solution**: Perhaps a subsection that describes some of the differences in participant comments may contribute toward understanding what quality of provenance visualization is considered valuable for communicating understanding. In the paper, you

emphasize that your visualization helped people understand the time it took to transform and encode the student records. How does this emphasis compare those who saw the prior visualization and those who had no comparison? If you do not add a subsection that discusses this, I would request that you encode which participants had exposure to the prior project in the transcripts; other researchers could make that comparison and potentially identify some differences between those with and without prior experience.

Openness

The interview transcripts are provided for the paper, but the participants are not labeled congruently with the Identifiers used in the paper. By using the search function in Word, I can find the quotations from the paper in the transcript. I would like the interview transcripts to be labeled with the same identifiers used in the paper. The paper provides a link to the visualization prototype tool live on the web and a link to a public search portal to find records from the data used in the visualization. I do not see the source code posted to Git Hub, a copy of the code, or another way of recreating the prototype.

Classification

Emprirical Research - Qualitative

Classification

Systems or design research

Recommendation

Minor Revisions

Revisions Requested

The paper is well written and had no typos from my review. I offer some suggestions in the review, but most of these are elements that would help strengthen the presentation. I would ask the authors to consider: 1. Soften the distinction in how provenance is used between the "humanities" and the "sciences." 2. Include a section to describe the researcher's reflexivity to help show any possible biases introduced in the methodology section. 3. Compare the types of responses you receive from those familiar and unfamiliar with your prototype and add a subsection to the discussion.

Reviewer Name

Jeremy E. Block

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Review #2

Recommendation: Accept Submission

Conflict Declaration

I declare that I have no known conflicts of interest with the authors.

Review

This article makes a useful contribution to the problems of tracking provenance in a number of fields in the humanities and data science through its account of a specific project's design and testing. It is a well-structured, lucid, complete report on a design project that tries to show the provenance of information in university records held in the library at St. Andrews. The records show matriculation, place of origin, name, and other demographic information and in their original were handwritten ledgers. The team members who produced the visualization have backgrounds in the humanities, computer science, and information design and all contributed to the project as a whole. The challenge they set for the project was to create a prototype visualization for tracking the transformation of records across time. This transformation included different moments of transcription in analogue formats as well as digital ones and the shift from a state that was not computationally tractable to one that could be processed and analyzed. As they note themselves, interactivity was not built into the design in this prototype, a point mentioned by their test subjects. But even that note about what was not attempted shows how careful, thorough, and conscientious this project is in its conception, execution, and assessment. The article is absolutely complete and authoritative, its references make clear where the project sits in the field of research into provenance as well as visualization strategies, and the report moves from design to feature description to user testing in clear, well-organized steps. I would use this for graduate students as an example of research design and reporting because it is so professional. This article is ready for publication in its current state.

I realize my task is to comment on the article and not necessarily on the project design of the visualizations. But if I were in conversation with this team, I would ask why they opted for a circular display format? I found correlation across the timelines difficult, and also, it locked the years/dates of transcription and years/dates of the records into an awkward relationship with respect to temporal metrics. I would pull those different timelines apart and stack them to show the relationship of one activity and phase of provenance activity to another. Also, some of the ways bibliographical materials are mapped in stemma charts might be of use. Single lineage vs. forking paths, breaks, and gaps in provenance information might be well served by those techniques. Just suggestions for next phases.

Openness

The article is fully transparent.

Classification

Emprirical Research - Qualitative

Classification

Systems or design research

Recommendation

Minor Revisions

Revisions Requested

I have one very minor suggestion. I found the first paragraph of section 2.2 a bit abrupt. I wasn't sure why it had the emphasis it did and I wasn't clear on the meaning of the sentences from their structure. Perhaps a transition sentence or paraphrase of that paragraph would connect it to the section just preceding? The statement that this is not "a piece of art or an experiment" is followed by two statements about the "artifact" and I was confused about what that was referencing. This project? Something else?

Reviewer Name

Anonymous.

ORCID

N/A

Review #3

Completed: 16-09-2024 15:04

Recommendation: Revisions Required

Conflict Declaration

I declare that I have no known conflicts of interest with the authors.

Review

This manuscript addresses a highly interesting and important aspect of both data visualization and digital humanities: presenting an interactive, provenance-driven data visualization approach. Through a qualitative study, it synthesizes participants' insights on how this approach could enhance awareness of changes, biases, and in/exclusions in visualized information, thereby promoting critical digital research in both Visualization and Digital Humanities. Given that previous approaches are not applicable to information transforming from physical to digital form and are also unable to capture the complexity and implications

of data transcription processes, I believe this work can contribute to both communities by developing, reflecting on, and evaluating a more transparent, ethical, and informed way to understand the provenance of any collected information.

The manuscript flows well, and the organization of the text is clear. The accompanying figures effectively support understanding the interaction and storytelling process of the provenance-driven visualization design. Furthermore, the authors provide a web-based design, making the manuscript easy to follow. The visualization compellingly tells the history of changes transcribed in university student records over more than 450 years, and I enjoyed interacting with it. However, improvements in evidence, such as participants' comments, implementation details, and study designs, should be made to give reviewers more confidence in the claims presented in the manuscript (See details in the 'Requested Changes').

Openness

The transcription of the study is provided, however, the details of the study design and the coding details were not provided: 1. The prompt used for the qualitative study, 2. Participants recruiting details, 3. The coding results for all the responses, 4. The Cohen's Kappa of the agreement between coding members.

Classification

Emprirical Research - Qualitative

Classification

Systems or design research

Recommendation

Major Revisions

Revisions Requested

Intro: It took me a while to distinguish between the authors' previous work and the novel contributions of this manuscript. The authors made great efforts in the first two paragraphs to provide background on provenance disclosure and the current gaps in visualization research. However, in the third paragraph, a solution as provenance-driven visualization is introduced but appears to be a contribution from previous work. Later sections clarify that the authors did design a series of new interactive visualizations, distinct from the previous work. I feel the authors could make it clearer what elements are drawn from previous research and what aspects are newly developed in terms of visualization design.

Related Works: I think in addition to exploring provenance across several fields, the authors could delve deeper into research on storytelling in visualization. Since storytelling techniques, such as textual and visual annotations, are crucial design elements in the proposed approach, it would be helpful to examine how these techniques in previous works could enhance viewer

engagement, aid in spotting visual patterns, and thereby support your research goal of promoting critical interpretation of collected information.

Provenance-driven visualization: I understand the authors' intention to use this section to introduce and identify the challenges in previous provenance-driven visualization designs. However, I think these points should be briefly summarized in the introduction to help readers better understand your motivations and contributions from the start. Additionally, the challenges and open questions proposed here seem somewhat repetitive of the contributions already stated in the introduction. It might be more effective to mention these briefly in the introduction and then use this section to delve into the details of previous designs. Minor: The caption of Figure 2 could be more detailed. What does each layer represent? Should readers interpret layers 1-5 sequentially? Is there a connection between each adjacent layer?

Conveying Provenance Through Visualization + Storytelling: The authors mentioned that their iterative design process was strongly informed by feedback from their previous design. It would be helpful to share what specific comments were received and how they influenced the design choices before introducing the new visualization design. Since the authors have already listed three challenges/open questions in the previous section, one suggestion could be to reuse these bullet points as subtitles to explain the rationale behind each design choice. Additionally, no tech stacks are mentioned, what tools did the author use to implement this design? " Minor: For the textual annotation in Figure 3, it would be helpful to mention why the data from 1579-1747 was not visualized (this could be done in the visualization, not just in the paper). Additionally, adding visual annotations to Figures 4 and 5 could enhance the readability of Sections 4.1, 4.2, and 4.3. For instance, when the authors mention that 'the line length indicates the duration of this information,' it wasn't immediately clear which line was being referenced. A corresponding visual annotation on the figures would be very helpful.

Study: I was wondering about the relationship between 1. the research question mentioned in the introduction, 2. the challenges/open questions in Section 3, and 3. the questions proposed in Section 5. While they overlap somewhat, they are not entirely the same. The authors should either clarify the connections or consolidate them into a single, cohesive series of questions to be addressed in this work. Additionally, the authors mentioned 'investigating…by people with different backgrounds,' but only 12 participants with either CS or History backgrounds were recruited. I'm not concerned about the small sample size, given that this is a qualitative study, but rather about the rationale and details of the recruitment process. For example, how were participants recruited, and what were the screening criteria? Most importantly, even though there is no task, then what is the prompt? Furthermore, the authors emphasized in the discussion that they expect the user to be anyone interacting with the data. Without further details, I'm not convinced that this sample is representative enough. In the collection and analysis, I would expect more details about the coding process: how many iterations were involved, and how well each member agreed on the codes (e.g., what was the Cohen's Kappa)?

Findings: Overall: The authors synthesized many interesting insights, but these insights do not fully answer the research questions. Many details (e.g., the codes, quotes, prevalence) could be summarized in a table. The authors should also evaluate these insights and discuss

how each one helps answer the research questions. For example, "The participants said this, so what?" The findings as presented currently do not adequately address the proposed questions. Section 6.5 is overwhelmed by quotes. A suggestion would be to use just one quote per statement and focus more on clarifying the limitations and open questions.

Reviewer Name

anonymous

ORCID

N/A

Metareview

Completed: 2025-01-20 04:30

Recommendation: Minor Revision

Conflict Declaration

I declare that I have no known conflicts of interest with the authors.

Review

This paper presents a visualization prototype for digital humanities that combines metadata and other artifacts. Reviewers agree that the paper is well-motivated and presents a valuable case study and prototype. Some concerns remain that reviewers generally agree can be addressed within a minor revision cycle. See Revisions Requested.

Revisions Requested

(1) Clearer language to soften the differences in humanities' and sciences' approach to provenance (R1)

(2) Add details on Researcher Reflexivity (R1)

(3) Compare reactions to those who were familiar vs. naive to the visualization approach (R1)

(4) Clarify first paragraph of Section 2.2 (R2)

(5) Delineate prior work from current contribution (R3)

(6) Explore related work on storytelling in visualization (R3)

(7) Additional synthesis of findings to ensure the presentation full addresses the research questions (R3)

(8) Openness: Ensure the same identifiers are used for participants in the paper as in the supplemental materials (R1) and that necessary study design details are explicated (R3)

The authors are encouraged to consider other minor suggestions by reviewers as well.

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