



Past Meets Future: Human-AI Interaction for Digital History and Cultural Heritage

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ABSTRACT

Digital History and Cultural Heritage encapsulate invaluable societal narratives, yet scholars and practitioners face challenges in data quality, accessibility, and engagement. Human-AI Interaction (HAI) holds promise to address these challenges, fostering enhanced analysis, discoverability, and storytelling at scale. However, its potential remains largely untapped by the HAI community. This workshop aimed to bridge this gap, inviting scholars and practitioners from fields such as human-computer interaction (HCI), artificial intelligence (AI), history, cultural heritage, and GLAMs (galleries, libraries, archives, and museums) to explore innovative HAI methodologies and frameworks tailored to these domains. Through interdisciplinary dialogue, we aimed to propose tractable solutions, enriching both the Digital History and Cultural Heritage sectors, as well as the HAI field, while nurturing a fertile ground for historical storytelling and meaningful engagement with our shared past.

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1 DESCRIPTION OF TOPIC

Recent digitization efforts have spurred the transformation of vast historical texts, photos, and maps into accessible digital archives worldwide, especially in galleries, libraries, archives, and museums (GLAMs). In the United States, the Library of Congress is actively digitizing its vast collection, with the goal of making most of its 170 million assets available digitally [27, 31]. Meanwhile, the Smithsonian Institution houses 4.9 million digital records [8]. Europeana, similarly showcases Europe's commitment to digital heritage, with

over 58 million digital items accessible to the global community [6]. These initiatives not only preserve and democratize access to cultural heritage, but they also bring together diverse stakeholders such as historians, archivists, librarians, journalists, genealogists, and the general public around these invaluable collections [21, 28]. Studying digital cultural heritage collections is essential to provide insights into the social, political, and cultural contexts of our shared history [19, 20]. Analyzing the narratives within these collections is a vital conduit for historical storytelling, linking the past to the present and future [33].

The fields of cultural heritage and digital history face several open challenges. These include ensuring data quality and accessibility [24], uncovering meaningful patterns in large digital archives (both digitized and born-digital) [10, 32], dealing with incomplete metadata [29], and addressing ethical and cultural sensitivity concerns [5, 11, 15, 17]. The lack of standardized metadata and the enormity of digital archives often hinder effective analysis and engagement [7]. Recent successful digital crowdsourcing projects, like Library of Congress's "By the People" transcription project [30], Civil War Photo Sleuth [26], Flickr Commons [13], and the National Archive's Citizen Archivist Dashboard [3], show the potential of collaborative research, crowdsourcing, and interactive exploration. However, these initiatives only scratch the surface of what is possible in this interdisciplinary domain. The digital archives also provide an opportunity for large-scale storytelling, which could bring the rich tapestry of historical narratives to a broader audience and create a deeper connection to our shared past [14]. These challenges open avenues for Human-AI interaction (HAI) to play a crucial role. By fostering collaboration and developing user-centric tools, HAI can make it easier to interact with and analyze digital heritage collections, while also addressing the ethical and cultural aspects of these domains [17].

The Digital Humanities (DH) and Library & Information Science fields have actively promoted the use of AI techniques in cultural heritage collections. They have identified key areas like machine learning for metadata generation, natural language processing for transcription and text analysis, and emphasize the need for an AI-literate workforce to foster deeper understanding and engagement with these technologies [7, 28]. However, there has been less interest from researchers in Human-Computer interaction (HCI) and Artificial Intelligence (AI) so far. Further, the advent of generative

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AI presents a wide range of exciting possibilities like historical storytelling, unstructured data analysis, and dynamic user interfaces. Techniques like visualizing collections [22], transcription [30], historical photo identification [23, 25, 26], exploratory search [34], Content-Based Image Retrieval (CBIR) [16, 18], storytelling [14], and gamified engagement [4, 9, 12] remain unexplored in Cultural Heritage and Digital History. This is especially true when it comes to advancing research methodologies and frameworks for HAI.

This “Past Meets Future” IUI workshop was centered around two main research questions:

- How can Human–AI interaction enrich and be enriched from the domains of Digital History and Cultural Heritage?
- How can the challenges and datasets inherent in Digital History and Cultural Heritage stimulate innovation in HAI research methodologies and frameworks?

Through this workshop, our goal was to expand the involvement of researchers in HCI and AI with the Digital History and Cultural Heritage domains. We aimed to encourage interdisciplinary dialogue to develop practical solutions and advance the field in a mutually beneficial direction.

2 ORGANIZERS

The organizers represented a diverse range of disciplines, spanning computer science, information science, history, and cultural heritage. They further brought specialized expertise in areas like HCI, crowdsourcing, HAI, computer-supported cooperative work (CSCW), computer vision, and digital libraries and archives. Their affiliations included academic, industry, and government organizations in the US and abroad.

Prof. Kurt Luther (<https://crowd.cs.vt.edu/kurt-luther/>) is an associate professor of computer science and, by courtesy, history at Virginia Tech. His research interests include crowdsourcing, social computing, and human–AI collaboration. He has led or co-lead multiple crowdsourced digital history projects, including *Civil War Photo Sleuth*, *The American Soldier in World War II*, and *Mapping the Fourth of July in the Civil War Era*. He is also a co-author of *The Collective Wisdom Handbook: Perspectives on Crowdsourcing in Cultural Heritage* [30]. He previously organized workshops at IUI, HCOMP, GROUP, and Creativity & Cognition.

Dr. Vikram Mohanty (<https://vikrammohanty.com/>) is a Post-doctoral Researcher at Bosch Research and Technology Center, USA. His research focuses on building and studying human–AI collaborative systems. He received his Ph.D. from the Department of Computer Science at Virginia Tech. As part of his research, he built *Civil War Photo Sleuth*, an online platform that combines crowd-sourced human expertise and AI to identify unknown portraits from the American Civil War era. His work has received major press coverage, including Smithsonian, Time, American Way, The History Channel, and Popular Mechanics, and won the Microsoft Cloud AI Research Challenge Grand Prize (2018), the IUI Best Paper (2019) award, the CHI Honorable Mention (2023) award, and the HCOMP Best Poster/Demo (2018) award.

Prof. Benjamin C. G. Lee (<https://bcglee.github.io/>) is an incoming Assistant Professor in the Information School at the University of Washington, as well as a Kluge Fellow in Digital Studies at the Library of Congress. He recently received his Ph.D. in Computer

Science & Engineering from the University of Washington. After graduating from Harvard College with an A.B. in Astrophysics and Mathematics, he served as the inaugural Digital Humanities Associate Fellow at the United States Holocaust Memorial Museum, as well as a Visiting Fellow in Harvard’s History Department. Ben also served as a 2020 Innovator in Residence at the Library of Congress and the 2020–2021 Richard and Ina Willner Memorial Fellow in the Stroum Center for Jewish Studies at the University of Washington. He has previously organized a workshop at DH Unbound 2022.

Prof. Ioanna Lykourantzou (<https://lykourantzou.com>) is an associate professor of collaborative technologies. Her research interests lie at the intersection of computer-supported collaborative work, crowdsourcing, and digital cultural heritage. She has led multiple digital cultural heritage projects, including the European Horizon 2020 project *Empowering reuse of digital cultural heritage in context-aware crosscuts of European history*, and the EU FP7 project *Personalized Museum Exhibit Monitoring and Description Based on Individual Visiting and Cognitive Style*. She previously organized workshops and Special Interest Groups at CHI, MobileHCI, UMAP, and KDD.

3 WORKSHOP FORMAT AND ACTIVITIES

3.1 Pre-Workshop Activities

3.1.1 Participants. Prior to the workshop and IUI 2024 conference, the organizers solicited submissions from prospective workshop participants. Promotion efforts spanned social media, mailing lists, and direct outreach to academic colleagues and those at GLAMs.

3.1.2 Submissions and Website. Given the interdisciplinary topic of our workshop and our goals of attracting participants from both computer/information science and humanities fields, we solicited submissions in a wide variety of formats that demonstrated the submitter’s interest in, or related experience with, human–AI interaction and/or digital history and cultural heritage. The acceptable submission formats were: (1) a new position paper of 2–4 pages, (2) a previously published paper, or (3) a link to a digital project. The organizers also served as the program committee reviewing submissions for the workshop. The organizers created a workshop website (<https://sites.google.com/vt.edu/pastmeetsfuturehaiworkshop/home>) that follows the SIGCHI Accessibility Guidelines [1]. The website included (1) a Call for Participation (CFP) elaborating on the requirements above, (2) a home page describing an overview of the workshop topics, (3) a page listing the organizers, and (4) a page listing key dates. We accepted 9 submissions for the workshop.

3.1.3 Chat Server. We plan to set up a Discord/Slack server ahead of the workshop to facilitate introductions and discussions on the submissions among participants. It will also facilitate participation for virtual attendees.

3.2 Workshop Day Activities

3.2.1 Format and Length. We organized a full-day workshop, with the morning focusing on presentations and discussion, followed by lunch, and an optional afternoon “hackathon” activity. At the direction of the workshop chairs, the workshop will be primarily an in-person event, with some virtual participation by exception.

3.2.2 *Morning (Required)*. The first half of the workshop (Morning) will be required for all participants and will focus on presentations, discussions, and finding common ground. The goal of these activities is to help build shared understandings and identify open challenges and research opportunities in human–AI interaction for digital history and cultural heritage.

- **Welcome**, 09:00–09:15. The organizers will welcome the workshop participants, briefly introduce themselves, and review the goals for the workshop, schedule for the day, and code of conduct.
- **Lightning Talks**, 09:15–09:45. Attendees who submitted materials will introduce themselves and their work for 1–3 minutes each, depending on the size of the group.
- **Panel and Q&A**, 09:45–10:30. We will invite an interdisciplinary panel of researchers with an established track record in digital humanities and cultural heritage to the workshop. Each panelist will give a brief introduction to their work, followed by questions from the moderator (one of the organizers) and attendees.
- **Break**, 10:30–10:45.
- **Small Group Discussion and Affinity Diagramming**, 10:45–12:00. The workshop will divide into small groups to identify shared research challenges and opportunities. Group leaders will report out their challenges and organizers will lead an affinity diagramming exercise to find overlaps across the groups.
- **Next Steps**, 12:00–12:30. The organizers will lead a discussion of next steps for workshop attendees to remain in contact, continue the discussions, and pursue research collaboration opportunities, including future workshops or SIGs on this topic.

3.2.3 *Afternoon (Optional)*. The second, optional half of the workshop (Afternoon) will focus on a hackathon-style activity. The term *hackathon* is used loosely here to include not only software development projects, but also other types of activities such as user studies, data analysis, design, or writing, that lead to tangible artifacts or outcomes. We take inspiration from the CrowdCamp hackathon workshops that several organizers have participated in at related conferences such as CHI, CSCW, and HCOMP [2].

- **Idea Pitches and Team Formation**, 14:00–14:45. Potential team leaders will pitch their ideas with short, informal presentations. Then, participants will self-organize into teams by aligning with the idea(s) they liked best. Organizers will assist with team formation and combine or split up teams as needed.
- **Work Session 1**, 14:45–15:45. Teams will begin work on their project ideas, starting with scoping the effort, defining goals for the afternoon, and discussing members' skills and roles. Organizers will join teams or rotate between teams to help with problem-solving.
- **Break**, 15:45–16:00.
- **Work Session 2**, 16:00–17:00. Teams will continue working on their projects and prepare a short presentation to share their idea and progress.

- **Final Presentations**, 17:00–17:30. Teams will give short presentations on their projects and receive feedback from the organizers and other attendees.

4 PLANNED OUTCOMES

Following the workshop, we intend to leave the chat server intact, enabling our attendees to extend their discussions both throughout and beyond the conference period. This platform will serve as a springboard for cultivating a community among HCI, AI, and digital humanities researchers around the world. All accepted submissions will be showcased on the workshop website and published (with authors' consent) in IUT's joint workshop proceedings. Additionally, we plan to contribute to the IUI workshop chairs' summary for the ACM Digital Library and elaborate on our workshop's proceedings for a submission to *ACM Interactions* or *CACM*. We also aim to use this inaugural IUI workshop as a stepping stone to future workshops and SIGs at other venues such as CSCW, CHI, JCDL, SIGIR, DIS, and HCOMP.

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