iSchool Research Showcase 2023
Presentation Abstracts

Deep Cover: A Game to Help Older Adults Navigate Digital Scams
Anita Nikolich, Dan Cermak

Deep Cover is a new spy-themed mobile game for older adults that helps them learn about digital scams. The game is based on multidisciplinary research done in our NSF Convergence Accelerator project, which included experts in cybersecurity, gaming, gerontology, education and information operations. Deep Cover is designed for older adults using language, themes and scenarios appealing to them. We conducted extensive user testing and partnered with a professional gaming company to design this novel app.
Keywords: gamification; digital scams; disinformation; cybersecurity

“I'm Not Confident in Debiasing AI Systems Since I Know Too Little”: Teaching AI Creators About Gender Bias Through Hands-on Tutorials
Kyrie Zhixuan Zhou, Jiaxun Cao, Xiaowen Yuan, Daniel E. Weissglass, Zachary Kilhoffer, Madelyn Rose Sanfilippo, and Xin Tong

Gender bias is rampant in AI systems, causing bad user experience, injustices, and mental harm to women. School curricula fail to educate AI creators on this topic, leaving them unprepared to mitigate gender bias in AI. In this paper, we designed hands-on tutorials to raise AI creators' awareness ofgender bias in AI and enhance their knowledge of sources of gender bias and debiasing techniques. The tutorials were evaluated with 18 AI creators, including AI researchers, AI industrial practitioners (i.e., developers and product managers), and students who had learned AI. Their improved awareness and knowledge demonstrated the effectiveness of our tutorials, which have the potential to complementthe insufficient AI gender bias education in CS/AI courses. Based on the findings, we synthesize design implications and a rubric to guide future research, education, and design efforts.
Keywords: AI, Gender bias, Education

Inclusive.AI: A Decentralized Approach to Engage Marginalized Group in AI Governance
Tanusree Sharma, Tanusree Sharma

Decentralized Autonomous Organizations (DAOs) have emerged as a novel way to coordinate a group of (pseudonymous) entities towards a shared vision (e.g., promoting sustainability), utilizing self-executing smart contracts on blockchains to support decentralized governance and decision-making. Over 4,000 DAOs have been launched in various domains, such as investment, education, health, and research, in just a few years. For example, UkraineDAO was built to launch a crowdfunding campaign to mint and sell non-fungible tokens (NFTs) of a Ukrainian flag to raise funds for civilian and military purpose. Building on the insights about DAO governance, we design and develop mechanisms called Inclusive.AI to promote a democratic decision process that allows diverse marginalized populations, such as youth, people with disabilities, people of color, and people from the Global South, equal access to major decision makings and produce better decisions for communities and society at large. Our plugin, Inclusive.AI is equipped with democratic mechanisms, such as a voting system, facilitating the decision-making process where users can actively determine the level of

personalization they would like to experience while interacting with AI. This ensures that the AI system adapts to individual preferences while respecting user boundaries.
Keywords: AI, Democratic, Personalization, DAO

Embedding Ethics in Infrastructure Supporting Data-Intensive Scholarly Research

Peter Darch, Ivan Kong, Kyra Abrams

Data-intensive scholarly research involves many ethical issues. Data about people or human processes can raise privacy challenges and lead to discrimination if groups are under- or over-represented. Open data poses additional challenges relating to consent. Using AI and machine learning approaches raises concerns around transparency, accountability, and algorithmic bias. Meanwhile, the CARE principles emphasize issues relating to Indigenous data, such as sovereignty. Research using data not about people can also have ethical implications when used to inform policy- or decision-making impacting communities. Challenges can multiply due to divergent ethical perspectives often encountered in interdisciplinary or international collaboration. Those who build, operate, and use computational infrastructure for data-intensive research are often concerned about ethical issues. However, they often struggle to identify how their choices and practices impact ethical outcomes. Under pressure to meet deadlines and pursue career objectives, stakeholders frequently sideline ethical issues. Researchers and software engineers instead often adopt a “two cultures” mindset, viewing their responsibilities as purely scientific and technical while framing ethics as the concern of philosophers and project management. We present an overview of our work to embed ethics in the Institute for Geospatial Understanding through an Integrative Discovery Environment (I-GUIDE), a five-year, $15-million NSF project that is building an AI platform to support scholarly research using geospatial data. Our focus is on two projects: 1) identifying opportunities to intervene in work practices of those building and using the I-GUIDE platform; 2) mitigating risks of bias by interrogating the development of models used in research using the I-GUIDE platform. These projects employ qualitative methods (observation, interviews, document analysis.)We have developed theoretical framework drawing from approaches in Library and Information Science and allied fields. LIS approaches bring a distinctive perspective to bear on issues of data ethics, offering new opportunities for insights and progress on mitigating harms.
Keywords: Data ethics; open science; research infrastructure; data curation

Messy Metaphors in Voice Interfaces: A Playful (and completely serious) Perspective

Smit Desai, Michael Twidale

Metaphors are pivotal in shaping our understanding and knowledge, extending far beyond their traditional usage in literature. This research embraces a constructivist perspective to explore the world of metaphors, emphasizing their critical role in elucidating complex concepts by relating them to familiar ideas. Drawing inspiration from influential works across various fields, including sociology and cognitive psychology, we underscore the significance of metaphors.While Human-Computer Interaction (HCI) has extensively examined metaphors, the focus has mainly been on graphical user interfaces (GUIs) in educational contexts. The rise of Voice User Interfaces (VUIs) presents a notable gap in research and design guidelines, where VUIs predominantly rely on the "humanness" metaphor, disregarding users' nuanced comprehension and potential for alternative metaphors. This research challenges the conventional practice of simplifying system personas and introduces

the concept of "metaphor-fluid" voice interfaces.The central argument advocates for VUIs capable of dynamically adapting metaphors based on conversation context, aligning closely with users' cognitive processes for more natural and intuitive interactions. This research comprises two key studies: Study 1 aims to identify the diverse metaphors users employ for VUIs and provides a contextual framework for their usage. In Study 2, we analyze metaphors embedded in VUIs within specific usage contexts, comparing metaphor-fluid VUIs with their default counterparts. This comparative analysis explores perceived differences across dimensions like partner models, personality traits, and overall user experience (UX).This research has the potential to revolutionize the design and development of voice user interfaces by challenging the overreliance on the "humanness" metaphor. By advocating for metaphor-fluid VUIs, it addresses the limitations of current design approaches, enhancing the user experience. These findings contribute to the advancement of HCI, shedding light on the complex interplay between metaphorical understanding, user experience, and interface design in voice user interfaces.
Keywords: Voice User Interfaces, Conversational AI, Metaphor Analysis

The core values and impact of public library makerspaces

Kyungwon Koh, Gowri Balasubramaniam, Emily Knox, & Andy Zalot

A number of today’s public libraries in the U.S. provide makerspaces or maker programs to community members, offering access to tools, spaces, programs, experts, and social opportunities. While a majority of the existing literature on makerspaces focuses on STEM (Science, Technology, Engineering, and Mathematics) education or individual learning outcomes, our research extends knowledge on how makerspaces located in public libraries reinforce, expand, and re-conceptualize the foundational values of librarianship.Using the twelve ALA Core Values of Librarianship and other fundamental concepts in librarianship, the study qualitatively analyzes data collected from thirteen focus group interviews with forty-two people—staff, users, non-users, and stakeholders, including teens and adults—recruited from three different library makerspaces in Illinois. The findings suggest that library makerspaces significantly support several core values, including Access, Education and Lifelong Learning, Diversity, Service, Social Responsibility, and more.The study also found the organizational impact that a makerspace has on their library, including changes in community members’ perceptions of libraries, pride in their library, drawing new and more community members, and staff’s sense of fulfillment and contentment. Additionally, challenges to these impacts and values included adaptation to change, visibility and awareness of the space, and accommodating diverse user groups.
Keywords: Public library, Core Values, Makerspaces

Sixty Years After Brady: A Survey of the States’ Criminal Discovery Rules Today

Catharine Young, Madelyn Sanfilippo

State-level criminal discovery rules are shaped by the 1963 Supreme Court ruling for Brady v. Maryland, which held that “the suppression by the prosecution of evidence favorable to an accused upon request violates due process where the evidence is material either to guilt or to punishment, irrespective of the good faith or bad faith of the prosecution”. This decision was an early step toward requiring information exchange in the pursuit of justice in criminal cases at both the federal and state levels. Some sates’ discovery rules go far beyond textual compliance with Brady to foster discovery processes that advocate for access to justice, including specifying the types of information that must be disclosed and the infrastructure

through which the information exchange occurs. However, many states' current criminal discovery rules still lack breadth and specificity to ensure appropriate and timely discovery disclosures are made, documented, and preserved.For this thesis research I consider tradeoffs between all attributes of discovery rules, including harms and remedies. I conducted a state-by-state survey that evaluates how each jurisdiction chooses to approach the discovery process in criminal proceedings. I explored changes over time and the impact of stakeholders and events. Results from this research provide clarity to judges, prosecutors, defense attorneys, politicians, and private citizens to better understand the extent and manner in which discovery information is used in their state. Further, this project will yield new insight into how discovery information transmission and governance impact American defendants who face criminal charges in states across the country. This research provides valuable insight to whether early, broad, and well-preserved discovery information provides better access to justice compared to discovery rules that do not prioritize those ideals.
Keywords: Information law; Information ethics; Government information

InterMusE: Designing a Digital Library for Collaborative Musicology

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[The following submission is based on work that will be presented at Digital Libraries for Musicology, 10 Nov 2023]The Internet of Musical Events: Digital Scholarship, Community, and the Archiving of Performance (or InterMusE) is an interdisciplinary collaboration of musicologists, computer scientists, concert providers, and archive and library specialists working at the universities of York, Swansea, Illinois, Waikato, and the British Library. We have been exploring the challenges of working with musical ephemera relating to historical concert performances, and the potential role digital libraries can play in supporting collaborative musicological research. Focusing on the British Music Society during the interwar period, we have constructed a prototype digital library comprising runs of concert programmes and season brochures, constituting a metadata-rich collection of highly formulaic homogeneous documents, are combined with related but extremely heterogeneous groups of documents, such as a contemporary musical dictionary, music society journal, composer directory, congress schedules. In this showcase presentation, we give an overview of the prototype. We detail how we have fused general-purpose open-source software—such as Greenstone, Mirador, and the SimpleAnnotationStore (SAS)—to develop an image-based digital library with editable annotations and backing store enhanced with linked data. We conclude with some commentary on how well engaging with these code-bases worked out in practice.
Keywords: Digital Libraries, Software Architecture, Open Source Software, Ephemeral Content, Music Societies