2017 iSchool Research Fair

6:30–8PM, March 9, 2017
University of Washington
Husky Union Building, South Ballroom

Information School
UNIVERSITY *of* WASHINGTON

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Research Fair

The Research Fair is our annual event for sharing and celebrating the work of our vibrant research community. We hope you will enjoy exploring how iSchool research is pushing boundaries, responding to significant real-world challenges, and making a difference in the lives of individuals and communities. At the iSchool, we make information work.

This year it is our distinct pleasure to honor Dean Harry Bruce and the transformation of the school's research enterprise under his 12 years of leadership.

Agenda
6:00–6:30 p.m.: Dean's Reception
6:30–8:00 p.m.: Open poster session and interactive demonstrations

Research Areas

- Children's Literature
- Data Curation
- Data Science and Analytics
- Digital Youth
- Human Computer Interaction for Social Good
- Indigenous Knowledge
- Information and Data Literacy
- Information Management
- Information Technology for Social Change
- Information, Values, Policy, Ethics
- Knowledge Organization
- Libraries and Librarianship
- Social Impact and Evaluation
- Social Media
- Visualization

Research Groups

- Curation & Metadata
- DataLab
- Digital Youth
- DUB Group
- GAMER Group
- iMed
- Mobile + Accessible Design (MAD) Lab
- Social Media (SoMe) Lab
- Tech Policy Lab
- Technology & Social Change Group (TASCHA)
- Value Sensitive Design (VSD) Research Lab

Posters and Demonstrations

1. Relational Dynamics of Participation: Refugee Education, Informal Learning, and Social Networking Sites

Negin Dahya, Emma S. Spiro, and Sarah Dryden-Peterson

This paper describes findings from an analysis of the social network formed through interactions in a transnational Facebook group. Community members in this group are located in Kenya's Dadaab refugee camps and internationally. The research sought to explore patterns of communication and the nature of network interactions across Facebook functions of posts, comments and likes. Conceptually, this research explores structural position in those networks of interaction and considers the meaning of social dynamics related to member location within or outside of the refugee camps.

2. Social Media Expressions of High-Risk Alcohol Use in Young Adult Peer Networks

Emma S. Spiro, Melissa Lewis, and Dana Litt

In this project, we use social media data as an indicator of alcohol use and drinking in young adults. While many have claimed that digital traces are predictive of offline behavior, we are able to directly explore these claims using a valuable dataset of survey responses of behavior from 215 participants in combination with observations of activity on the microblogging platform Twitter. We aim to gain a better understanding of whether social media can be an indicator of young adults' risky alcohol-related behavior.

3. Rumors at the Speed of Light? Modeling the Rate of Rumor Transmission during Crisis

Li Zeng, Kate Starbird, and Emma S. Spiro

Social media have become an established feature of the dynamic information space that emerges during crisis events. Both emergency responders and the public use these platforms to search for, disseminate, challenge, and make sense of information during crises. In these situations, rumors also proliferate, but just how fast such information can spread is an open question. We address this gap, modeling the speed of information transmission to compare retransmission times across content and context features. We specifically contrast rumor-affirming messages with rumor-correcting messages on Twitter during a notable hostage crisis to reveal differences in transmission speed.

4. Demographic Opportunity Structures in Activity-based Online Social Networks

Emma S. Spiro and Zack W. Almquist

People adjust not only their opinions, but also their behaviors based on both direct and indirect social interaction. Questions about influence are particularly salient for activity-based behaviors; much attention has been paid to promoting healthy habits through peer-social networks. In this work, we explore how social interaction may be structured along demographic features using a large-scale, rich dataset capturing behavior and social interaction in a social fitness community over the period of multiple months. We begin with an analysis of observed homophily across different types of social relationships, with particular attention to gender.

5. KidsTeam UW – Examining Adult-Child Interactions in Participatory Design

Jason Yip, Kiley Sobel, Caroline Pitt, Kung Jin Lee, Sijin Chen, Kari Nasu, and Laura R. Pina

In this study, we unpack what constitutes an "equal partnership" in PD between adults and children. We created a new framework that examines the complementary roles between children and adults. Next, we analyzed a case study of a yearlong intergenerational design team of children (ages 7-11) and adults. From this analysis, we determined that design partnerships are composed of four dimensions that span from unbalanced to balanced interactions: facilitation, relationship building, design-by-doing, and elaborating together. Finally, to demonstrate its utility, we analyzed two focal co-design sessions using our framework. Our analysis suggests that an equal partnership in PD is not a single static interaction but a development over time of design interactions influenced by context, experience, and participants.

6. Science Everywhere

Caroline Pitt, Jason Yip, Diana Griffing, Arturo Salazar, and Magda Carina Vazquez Lua

Researchers believe that technology could afford anytime-anywhere science learning, but we still do not understand how learners behave differently across contexts, such as home, school, and in the community, and how to help youth identify as science learners across these diverse contexts. In Science Everywhere, we ask, "How do neighborhoods learn science together?" We work with neighborhoods to develop community science inquiry through family science nights, after-school programs, and classroom implementations using our sociotechnical system. Using participatory design techniques, we have worked with stakeholders to create a social media-type system that can be used on mobile devices and shared on large, public tangible displays. Our work aims to support a future of connected science learning in which every learner can develop the ability to "scientize" their daily life.

7. Latino Youth Searching and Brokering Online Information For Their Families

Jason C. Yip, Carmen Gonzalez, Laura Pina, Beth Bollinger, Carolina Nieto, Maria Cuevas, and Kia Patiño

Youth are emerging as important information brokers for their families, particularly within immigrant families where parents or other family members may be English-language learners (ELL). We know very little about the obstacles that youth in ELL families face in the act of searching, interpreting, and translating online information. This study seeks to better understand the dynamics of technology and information brokering through a qualitative study of 25 to 30 Latino families. We examine the strategies and obstacles that Latino youth (ages 10-18) and their parents experience during the brokering process. Our findings will contribute to theoretical understandings of how immigrant and ELL families pursue goals and address problems as a team, and how digital inequality may exacerbate broader social inequalities.

8. From the Lab to the Crowd: Scaling End-User Elicitation Studies for Crowd-Based Design

Abdullah Ali, Meredith Ringel Morris, and Jacob O. Wobbrock

In recent years, end-user elicitation studies have become a popular research and design method for gathering input from end-users to inform the design of interactive systems. In such studies, end-users themselves are shown the outcomes or state changes of specific interactions, and end-users propose

actions that would cause such outcomes. To date, however, end-user elicitation studies have been run only in laboratory-based settings. They recruit a modest number of participants and usually result in large amounts of manual data analysis for researchers and designers. If more end-users were involved in such studies, more representative data could be collected. In our ongoing work, we are creating methods, processes, and a platform for conducting end-user elicitation studies online using crowdworkers. Crowdworkers will also help aid in the data analysis of such studies, considerably reducing the burden on researchers and designers. Our platform, called Crowdlicit, will aid researchers and designers to quickly deploy an end-user elicitation study in the crowd for designing such things as gestures, voice commands, and icons, to name a few.

9. Adaptive Support for Collaborative Learning at Tabletop Computers

Abigail Evans, Katie Davis, James Fogarty, and Jacob O. Wobbrock

Tabletop computers are a novel technology with a number of affordances for collaborative learning. However, collaboration at a tabletop computer is just as susceptible to breakdowns as other forms of face-to-face group work. Through modeling and adapting to groups' collaborative processes, tabletop software can become a powerful tool to help students realize the benefits of collaborative learning. We have built a system called Group Touch that detects behaviors associated with poor collaboration. In ongoing work, Group Touch will support the design and development of tabletop software that can recognize and respond to breakdowns in collaboration in order to help students learn together effectively.

10. The Effects of Visual Presentation on the Perceived Veracity of Unfamiliar News Sources

Anya Hsu, Michael Magee, Marijn Burger, and Jacob O. Wobbrock

Creating and hosting websites that anyone can access has never been easier than it is today, as seen clearly in the explosion of fake news across social media outlets during the U.S. presidential election in 2016. Although fake news can be characterized by its fabricated and politicized content, visual presentation also may play a role in distinguishing fake news from reputable news. Also, in online news, as in any form of online and print media, the visual presentation of the content can undoubtedly influence the reader. In this project, we are studying how certain visual attributes (such as article layout, presence of links or media, font size, font type, etc.) in news articles affect the judgments people make about how believable unfamiliar news sources are, independent of whatever content the news article may contain. By focusing on visual presentation of online news, we might be able to eventually contribute to automatic detectors and filters that do not have to rely only on content analysis to detect fake news, but additionally can rely on visual aspects as well.

11. Anachronism by Design: Understanding Young Adult Technology Perspectives through End-User Icon Elicitation

Erin McAweeney, Abdullah Ali, and Jacob O. Wobbrock

Ever since their invention in David Canfield Smith's 1975 Pygmalion system, icons have been a vital part of graphical user interfaces, visually communicating objects and functions to users who depend on them for mnemonic recognition (rather than memory recall). But a surprising number of today's icons on desktops and in applications are based ▶

◄ on "anachronistic designs," i.e., designs based on objects or concepts no longer in use from a previous era. Perhaps the most pervasive anachronistic icon is the 3.5-inch floppy diskette still used widely to indicate "Save." Users come to learn such associations and rely on them, but how do today's newest adults (18- to 20-year-olds) who grew up without the real-world associations intended for anachronistic icons think about them? What icons might they design for themselves if unencumbered by anachronism? What do their current associations tell us about how technology has evolved, and how it has not? In an ongoing study, we are interested in answering these and related questions, gaining insight into young adults' experiences of symbols within their technologies. Using an end-user elicitation approach, we will also elicit a set of new icons from these young adults, who almost certainly have never held a 3.5-inch floppy diskette in their hands.

12. Accessible Touch Input for People with Motor Impairments

Martez E. Mott and Jacob O. Wobbrock

Touch input has emerged as a dominant form of interaction for billions of interactive computing devices such as smartphones, tablets, and interactive public kiosks. Although touch input is widely used, it remains largely inaccessible for many people with motor impairments such as cerebral palsy, muscular dystrophy, and multiple sclerosis. Our work employs advanced pattern matching techniques to create intelligent touch interaction capabilities that allow users with motor impairments to touch the screen in whichever way is most comfortable and natural to them, and for the system to respond as if the screen was touched precisely.

13. Designing Peer-based Supportive Chat Tools for Mental Health

Katie O'Leary, Wanda Pratt, and Jacob O. Wobbrock

Peer support for mental health is costly because it requires social capital, time, and expertise (e.g., the supporter needs to know "how" to be supportive), and risky due to issues of stigma and uncertain benefit of reaching out. This work seeks to understand how to design online tools for supportive "chat sessions" that reduce the costs and risks of seeking peer support for mental health. The major contributions of this work are: (1) a tool called "Chatback" for supportive peer-based chats that lead to more positive thoughts and feelings; (2) evidence of the tradeoffs of structured versus unstructured online chats for mental health; and (3) implications for designing tools for peers to develop supportive skills in online chats.

14. Enhancing the Accessibility of Mobile Applications with Interaction Proxies

Xiaoyi Zhang, Anne Spencer Ross, James Fogarty, Jacob O. Wobbrock, and Anat Caspi

Smartphone apps are becoming more important in daily life, yet many remain inaccessible for people with disabilities. Currently, there is a large reliance on app developers to create accessible apps, and to fix accessibility barriers in apps' original source code. We demonstrate an approach that allows third-party developers to enhance apps without having access to the source code through "interaction proxies." Interaction proxies overlay an inaccessible smartphone app and route user input into the underlying app. We've developed multiple interaction proxies to demonstrate the power of this approach.

15. Epidemiology as a Model for Large-Scale Application Accessibility Assessment

Anne Spencer Ross and Jacob O. Wobbrock

Accessibility is often a property considered at the level of an individual mobile application (app), but rarely for entire application ecosystems like an app store. We present a conceptual framework for the accessibility of mobile apps ecosystems based on epidemiology. The framework contains notions like "incidence," "prevalence," and "risk factors," inspired by epidemiology, but now where "inaccessibility" is the "disease" and apps constitute the "population." This new framing offers terminology, motivation, and techniques for analyzing app accessibility on a large, "population-based" scale. In ongoing work, we are applying our conceptual framework to a large automated-plus-crowdsourced analysis of buttons in Android smartphone apps, validating our findings against a stratified random sample checked by hand, to reveal numerous accessibility problems and patterns, or, in our new framing, "risk factors" for the inaccessible button "disease." We are also identifying "causal agents" (e.g., toolkits) and "disease reservoirs" (e.g., popular app tutorials). We are building a system called EpiAccess, which implements our ecosystem-crawling accessibility assessment tool guided by concepts from our new epidemiology framework.

16. Incorporating Design for Social Accessibility in Design Thinking

Kristen Shinohara, Jacob O. Wobbrock, and Wanda Pratt

Assistive technologies, increasingly comprising computing technologies of all kinds, are intended to help people with disabilities accomplish everyday tasks. Yet, assistive technologies are traditionally designed exclusively with functionality in mind, rather than with consideration for social situations that are increasingly common with widespread mobile and wearable technology use. As a result of this function-first focus, assistive technologies are often "medical" in appearance and socially awkward to use, leading to misperceptions about these technologies and their users, ultimately impeding access and leading to abandonment. Social Accessibility is a new conceptualization of accessibility blending social and functional design considerations for improving technology accessibility, expanding awareness in design thinking to include the socio-technical experiences of people with disabilities. Design for Social Accessibility is a perspective shift that incorporates techniques and tools to increase awareness and improve practices around the design of accessible technologies.

17. RainCheck: Making Capacitive Touch Work in the Rain

Tony Tung, Vivek Shankar, Mayank Goel, and Jacob O. Wobbrock

Touch is the dominant way users interact with today's smartphones. Currently, most smartphones are built with capacitive-sensing touchscreens, which can detect and measure anything that is conductive or has a dielectric from the air. However, touch interactions are disrupted by raindrops, water smear, and wet fingers because current touchscreens cannot distinguish finger touches from other conductive materials on the screen. In rainy cities like Seattle, rainwater on touchscreens can represent a serious impediment to interaction while on-the-go, causing users to overly focus on their smartphones at the expense of their surroundings, even increasing safety risks especially while walking near busy streets. RainCheck is a system we are developing that allows users to interact successfully with touchscreens even when such screens are wet. RainCheck utilizes pattern matching and machine learning to differentiate fingertips from raindrops and water smear, adapting in real-time to restore successful interactive capabilities to the user, all behind-the-scenes.

18. Drunk User Interfaces: Using Smartphone-Based Human Performance Tests to Detect Inebriation

Alex Mariakakis, Abdullah Ali, Sayna Parsi, Shwetak N. Patel, and Jacob O. Wobbrock

The standard quantitative method for assessing inebriation is to use a breathalyzer. However, breathalyzers are primarily owned by law enforcement and used only after a drunk individual is caught behind the wheel. Unlike breathalyzers, smartphones are one of the most ubiquitous technologies in today's society. If smartphones could be used to reliably detect inebriation, they could be employed in ways to prevent drunk driving (e.g., by linking the smartphone to the car) or to incent good behavior (e.g., by lowering insurance for those who pass an app-based test before driving after 10 p.m.). We are running an ongoing study to examine whether or not challenging human performance tasks (e.g., typing, swiping, reacting) can be implemented on the smartphone to detect inebriation and prevent drunk individuals from getting behind the wheel. These tasks not only assess drunkenness from a performance perspective, but also from the perspective of the smartphone sensors.

19. Results from Multi-year Deployment of SQL-as-a-Service for Science Platform

Jain Shrainik

SQLShare is a database as a cloud service platform aimed at removing entry barriers to databases: installation, configuration, schema design, tuning, data ingestion, and even application design. The user simply uploads data and immediately starts querying it. We studied the workloads from a multi-year deployment of the SQLShare service and found that in a relational setting, minor changes in the database delivery vector — providing easy dataset-at-a-time ingest, relaxing the requirement for well-defined schemas via automatic schema inference, supporting dataset sharing, and full SQL support — increased the uptake of databases for scientific analysis.

20. Open Data Literacy Project

Nicholas Weber, An Yan, and Carole L. Palmer

The Open Data Literacy project is preparing future and current librarians to advance open data initiatives. This poster will provide an overview of the planned activities and project design, with a focus on strategies that iSchools can implement to collaborate with public sector partners to overcome the current lag in data expertise in the public library workforce. Core activities include new curriculum for master's students in Library and Information Science, a slate of fieldwork opportunities at institutions managing and publishing open data, and community workshops and open education resources for public librarians and information professionals. The educational framework will improve public accessibility and use of open data while increasing the data capabilities of both new and practicing information professionals in public libraries.

21. Predicting Student Dropout in Higher Education

Lovenoor Aulck, Dev Nambi, and Jevin West

Each year, roughly 30 percent of first-year students at U.S. baccalaureate institutions do not return for their second year and more than $9 billion is spent educating these students. Yet, little quantitative research has analyzed the causes and possible remedies for student attrition. Here, we describe initial efforts to model student dropout using the largest known dataset on higher education attrition, which tracks more than 60,000 students' demographics and transcript records at a large public university.

Our results highlight several early indicators of student attrition and show that dropout can be accurately predicted even when predictions are based on a single year of academic transcript data. These results highlight the potential for machine learning to have an impact on student retention and success while pointing to several promising directions for future work.

22. Mathematical Jargon: Characterizing Differences in Scientific Fields by their Use of Technical Language

Jason Portenoy and Jevin D. West

The use of specialized language, or "jargon," can increase the efficiency of communication within a group. However, it can decrease the efficiency of communication to a different group unfamiliar with this jargon. Previous work has used an approach based on information theory to measure this communication gap between scientific fields based on the frequency of phrases they used. We extend this approach to examine the use of mathematical language across disciplines in papers published in the arXiv. We find that the method tends to cluster scientific fields in intuitive ways, suggesting that focusing on mathematical language may be useful in linking papers and fields, and feeding search engines and recommendation systems.

23. Whose Truth? Digital Recordkeeping and Evidence in a Post-Truth World

Nic Weber and Joseph T. Tennis

Recordkeeping for the purposes of evidence-based decision-making requires belief in many tenets of the Enlightenment Project (EP). The EP states that truth can be attested through documenting acts or facts. Increasingly we see competing fronts of ideological divergence from the EP. In the context of a post-truth world, what are the recordkeeping

requirements? What technical manifestations in documentation change when anti-EP fronts commandeer the ontology of recordkeeping? This poster introduces these concepts in the long discourse generated by the InterPARES research project, and points to research questions that surface from these contemporary concerns.

24. A Knowledge Organization System Observatory: First Steps and Functional Requirements

Joseph T. Tennis

In the context of the descriptive turn, the move to describing how knowledge organization systems (KOS) emerge and evolve in extant information systems ecologies requires us to benchmark functionality and take census of installations. To that end, work has begun to outline the functional requirements for an observatory that would do this work. Such an observatory would provide descriptive records of KOS, a fossil record of how they evolve and the changes they make as they move from one version to another. This poster outlines the attributes of those KOS records and the functional requirements for census data on KOS.

25. Conceptual Analysis and Scheme Change: Assumptions and Research Design Decisions

Joseph T. Tennis

In studying scheme change, researchers must identify what is stable and what changes over time. In order to do this we must define the semantics of the systems under scrutiny. There are many arguments advanced for how we are to do this. Conceptual analysis in the vein of conceptual geometry may provide some techniques useful to this research area. In the theory of conceptual geometry, Gärdenfors advances a topology of semantics that allows us to frame the semantic discussion along cognitive, perceptual, and embodied ways in the context of indexing languages.

26. Methodological Constructs in Descriptive Informatics and Framework Analysis

Joseph T. Tennis

In service to understanding metadata in the wild, we have made descriptive turn in the study of metadata systems. This work, including Feinberg, Andersen, Adler, and others have begun the project of reading metadata schemes. In that vein we have developed some methodological constructs to help systematize these readings and extend them to systems evaluation. We call our extension, framework analysis. This poster provides a list of those constructs, rooted in literature, and templates for framework analysis.

27. The Subject Ontogeny of Eugenics in the New Classification Scheme for Chinese Libraries and the Nippon Decimal Classification

Wan-Chen Lee

This study explores the subject ontogeny of "eugenics" by reviewing all editions of the New Classification Scheme for Chinese Libraries (CCL) and the Nippon Decimal Classification (NDC). We observe the relative stability and concentration of class numbers assigned to "eugenics" in the CCL and the NDC comparing to the Dewey Decimal Classification, and the semantic changes of class numbers over time. Using union catalogs, we retrieve bibliographic records with "eugenics" as subject heading, and compare the sanctioned class numbers with the assigned numbers. This study highlights the temporal aspect of classification schemes, and how it may influence information organization and retrieval.

28. SimpleScience: Lexical Simplification of Scientific Terminology

Yea-Seul Kim, Jessica Hullman, Matthew Burgess, and Eytan Adar

Lexical simplification of scientific terms represents a unique challenge due to the lack of a standard parallel corpora and fast rate at which vocabulary shift along with research. We introduce SimpleScience, a lexical simplification approach for scientific terminology. We use word embeddings to extract simplification rules from a parallel corpora containing scientific publications and Wikipedia. To evaluate our system we construct SimpleSciGold, a novel gold standard set for science-related simplifications. We find that our approach outperforms prior context-aware approaches at generating simplifications for scientific terms.

29. Stakeholder Tokens: A Constructive Method for Value Sensitive Design Stakeholder Analysis

Daisy Yoo

Central to a value sensitive design approach is identifying key stakeholders and providing a rationale for their inclusion in the design process. Stakeholder analysis may require extensive conceptual and empirical work. Yet it is often unclear how to effectively do so. In this poster, I introduce a method for designers to better understand stakeholders — the Stakeholder Tokens. Stakeholder Tokens present a playful and holistic approach to support stakeholder analyses by engaging hands-on design activities. The Tokens serve a multiplicity of purposes, including (a) generating a more complete initial set of stakeholders, (b) clarifying stakeholder dynamics, and (c) identifying key stakeholders.

30. VSD Grand Challenges

Batya Friedman, David Hendry, Daisy Yoo, Ian King, Nick Logler, and Annuska Perkins

To explore the next decade of research and design in value sensitive design, more than 50 people gathered at two international workshops in 2015-16. The aim of these workshops was to identify a set of grand challenges — substantial research challenges, with fairly clear objectives, best engaged by several groups, in multi-year projects. Grand challenges are intended to position the community to tackle research synergistically, while also attracting new research interest and funding. In this poster we present 12 grand challenges and we discuss how we think they will help the value sensitive design community advance theory, method, and practice.

31. NatureCollections: Can a Mobile App Connect Kids with Nature?

Katie Davis, Josh Lawler, and Saba Kawas

The Nature Collections app aims to support children's outdoor activities and at the same time tackle a major societal problem — habitat loss. Given the link between time spent in nature and environmental attitudes, the fact that children are spending less time outdoors than ever before poses a threat to nature conservation. The app will engage children, ages 7-11, in exploration of the natural habitat by allowing them to build and share photo collections. It will facilitate collaborative play through scavenger hunts and nature challenges. To assess the effectiveness of the app, we will use in-app survey instrument evaluations to measure connectedness to nature during the app use.

32. Accessibility Teaching Efforts in Computing Curriculums

Andrew J. Ko, Richard Ladner, Kristen Shinohara, and Saba Kawas

AccessComputing Alliance aims to integrate accessibility and universal design content into computing courses. Given the link between computing professionals' accessibility knowledge and their capabilities as a workforce to address accessibility barriers in computing, we want to understand how accessibility is currently being taught in computing curricula. Therefore, we are conducting a nationwide survey of current accessibility teaching practices that will launch in the Spring quarter 2017. The goal of this survey is to understand what accessibility practices are taught in college computing courses, how instructors share accessible design strategies in their curricula, and at what scale and to whom they teach these accessibility practices.

33. Genie: Input Retargeting on the Web through Command Reverse Engineering

Andy Ko

Genie converts websites that only support one type of input, such as mouse or keyboard, to support all kinds of input including speech, making applications more accessible and powerful.

34. PSTutor: Teaching Programming Problem Solving with Worked Examples

Andy Ko

This project illustrates a new approach to teaching programming by focusing on problem solving processes and self-regulation skills.

35. PLTutor: Rapid Programming Language Learning

Andy Ko

PLTutor teaches programming language semantics by providing a highly granular visualization of program execution.

36. Gidget: A Debugging Game for Learning to Code

Andy Ko

Gidget teaches debugging by translating debugging tasks into game-based puzzles.

37. Viziometrics: Analyzing Visual Information in the Scientific Literature

Poshen Lee, Sean Yang, Maxim Grechkin, Lia Kazakova, Jevin West, and Bill Howe

Scientific results are communicated visually in the literature through diagrams, visualizations, and photographs. These information-dense objects have been largely ignored in bibliometrics and scientometrics studies when compared to citations and text. In this project, we use techniques from computer vision and machine learning to classify more than 8 million figures from PubMed into five figure types and study the resulting patterns of visual information as they relate to impact. We find that the distribution of figures and figure types in the literature has remained relatively constant over time, but can vary widely across field and topic. We find a significant correlation between scientific impact and the use of visual information, where higher impact papers tend to include more diagrams, and to a lesser extent more plots and photographs. To explore these results and other ways of extracting this visual information, we have built a visual browser to illustrate the concept and explore design alternatives for supporting viziometric analysis and organizing visual information. We use these results to articulate a new research agenda – viziometrics – to study the organization and presentation of visual information in the scientific literature.

38. Learning from Millions of Scholars and Billions of Downloads

Ian Wesley-Smith and Jevin West

What can we learn from watching millions of scholars use a non-profit publisher/archives website over a decade? In this project we examine how the behavior of scholars and students seeking academic articles has changed over time, and how new technologies (e.g. Google Scholar) have impacted the information they retrieve.

39. Let's Talk: Meta-Conversations about Dialogue

Kris Morrissey

Through dialogue-based programs, museums are negotiating the complicated and sometimes contested spaces between the lived experiences and values of individuals in our communities and the cultural resources and content expertise that museums hold in public trust. The Let's Talk project examined what we know and don't know about dialogue-based programs through a research symposium with museum experts across science and cultural institutions. The project developed a set of priorities and a graduate course for pre-professionals and ends with a call for further articulation and appropriate measurement of the intended impacts and a push to develop field-wide infrastructure for dialogue-based programs.

40. Deep Curation: Unsupervised Curation of Biological Repositories

Maxim Grechkin

Public repositories such as Gene Expression Omnibus (GEO) have seen rapid accumulation of biological data. However, high-quality and consistent annotation is generally unavailable, which severely limits the use of multiple datasets for new discoveries, reproducibility, and other computational tasks. Previous attempts to automate the curation task require hand-labeled training data, which is not generally available and must be reacquired whenever the ontology that provides the class labels change. We propose a new method that learns tissue type labels for GEO datasets with no training labels. We learn two classifiers in tandem, one over the free-text description for a dataset and another over the raw microarray signal itself, and having the two classifiers train each other iteratively. We applied this method to GEO to produce an expression-based classifier that outperforms the state-of-the-art supervised-learning method in accuracy without any hand-labeled training data.

41. Breakthrough: Examining Bias in Screening Interviews towards Individuals with Autism in the Tech Industry

Hala Annabi, Annuska Zolyomi, Meredith Ringel Morris (Microsoft Research), Saki Uwagawa, Julia Bobrovskiy, and Sulekha A. Ali

Recent studies suggest that individuals with autism are more likely to pursue and persist in employment within STEM. Unfortunately, anecdotal evidence suggests that these individuals are challenged in securing employment in STEM due to barriers inherent in screening interviews during typical recruitment activities. Behaviors associated with autism, such as repetitive physical movement, limited eye contact, and responses to social cues might be the reason for why these talented individuals are excluded from full consideration. Breakthrough is a research initiative that examines bias toward individuals with autism during recruitment screening interviews. The project aims to develop interventions geared at interviewers and candidates to reduce that bias.

42. Just How Effective Are Affinity Groups for the Retention and Advancement of Women in the IT Workforce?

Hala Annabi, Sigifredo I. Mora, and Mina Tari

Despite the significant investments organizations make in Diversity and Inclusion interventions to increase participation of women in Information Technology (IT), women make up only 26 percent of the IT workforce. The persistently low representation of women raises questions regarding the effectiveness of interventions to address barriers women experience. The proposed research investigates the characteristics and effectiveness of the most prevalent D&I intervention method utilized in IT, Women Affinity Groups (WAGs). Results from this study will inform our theoretical understanding of factors influencing the design and deployment of WAGs and result in instruments to be used for their assessment. This understanding will also inform design and deployment of sensitivity education within IT-related disciplines in industry and higher education.

43. Privacy, Security and Accountability: Ethics, Law and Policy

Adam Moore

What is the appropriate balance between privacy, security, and accountability? What do we owe each other in terms of information sharing and access? Why is privacy valuable and is it more or less important than other values like security or free speech? Within democratic societies, privacy, security, and accountability are seen as important values that must be balanced appropriately. If there is too much privacy, then there may be too little accountability, and too little security. On the other hand, where there is too little privacy, individuals may not have the space to grow, experiment, and engage in practices not generally accepted by the majority.

44. Mobile Information Literacy: Digital & Information Literacy Skills for Mobile-Centric Populations

Melody Clark

For billions of people coming online around the world, mobile phones (and increasingly smartphones) are their point of entry to the internet. However, the user experience on a smartphone is very different from that on a PC or a feature phone. The different affordances and limitations of each device shape how people interact with information, and even one's conceptualization of the internet itself. Existing information and digital literacy frameworks illustrate a PC-centric orientation. At the same time, lack of digital skills remains a top barrier to taking advantage of technology. Mobile Information Literacy — a combination of digital, internet, and information literacies for smartphone-first and smartphone-centric populations — fills a critical gap between access alone and realization of the benefits mobile technologies and applications can have.

45. TASCHA and Future of Libraries

Chris Coward

With funding from the Gates Foundation, the Technology & Social Change Group (TASCHA) is embarking on a 10-year partnership with the International Federation of Library Associations and Institutions (IFLA) and the Public Library Association (PLA) to continue the transformation of public libraries as critical centers of learning, creativity, and community development. TASCHA's focus is to incubate new ideas and solutions that will propel the public library field forward, serving as an open platform for thought leaders from within and outside the library sector to engage on the pressing issues facing the field.

46. Linked Data for Professional Education (LD4PE) – Enabling Librarians to Learn the Basics and Beyond

Michael Crandall, Marcia Zeng, and Stuart Sutton

While many learning resources have been developed to explain and support the use of Linked Data, they are often scattered and difficult to put into context for a library professional who may not be familiar with the concept of Linked Data, and lacks knowledge of where to start or what path to follow to accomplish their objectives. Funded by a grant from the U.S. Institute for Museum and Library Services (IMLS), the Linked Data for Professional Education (LD4PE) project is collecting and organizing these resources through a competency framework for Linked Data practice, exposed through a website (http://explore.dublincore.net) that is designed to support the structured discovery of learning resources for Linked Data by librarians and cultural heritage professionals.

47. Development and Access to Information: Assessing How Access to Information Contributes to Advancing the U.N.'s Sustainable Development Goal

Maria Garrido, Lucas Koepke, and Michelle Fellows

Access to information (A2I) is an issue that underpins development policies globally. We see this in the Sustainable Development Goals (SDGs) of the U.N. 2030 Agenda, where A2I is embedded in targets on ensuring public access to information and universal internet access, while also supporting targets on improved health, education, economic, and governance outcomes. Our project will assess how A2I contributes to advancing the SDGs. This poster shares early outputs from our research, including a conceptual framework and a baseline of indicators that will be used to track progress in the A2I landscape through 2030.

48. Massive Open Online Courses and Development: An Examination of MOOC Usage for Professional Workforce Development Outcomes in Colombia, the Philippines, & South Africa

Maria Garrido and Lucas Koepke

The development of Massive Open Online Courses (MOOCs) heralded an exciting breakthrough by providing free instruction from universities to anyone with internet access. The research in Advancing MOOCs for Development Initiative study was designed to analyze the MOOC landscape in developing countries and to better understand the motivations of MOOC users and afford insights on the advantages and limitations of MOOCs for workforce development outcomes. The key findings of this study challenge commonly held beliefs about MOOC usage in developing countries, defying typical characterizations of how people in resource constrained settings use technology for learning and employment.

49. SIET – An Indigenous Information System with Tzeltal Communities in Chiapas, Mexico

Ricardo Gomez, Clarita Lefthand-Begay, Jessica Humpries, Kelle Rose, Leslie Granillo, Freddy Mora, Vero Guajardo, Yvette Iribe, Cala Zubair, and Jeannie Berwick

We support indigenous culture and identity among Tzeltal community in Chiapas, Mexico, through the creation of a community library, strengthening programming of a community radio station, and using participatory photography to document development impact of activities leading to improving quality of life. In the Tzeltal indigenous tradition, quality of life is called Likil Cuxlejalil, a notion that involves harmony between body, mind, spirit, family, community and environment. We structure the organization of the library, the programming of the radio, and the evaluation using participatory photography, around the key pillars of likil cuxlejalil.

50. Digital Badges for STEM Education

Caroline Pitt, Adam Bell, Ada Kim, and Katie Davis

This poster presents the participatory design and implementation of a digital badge system to promote the skills and achievements of high school students who participate in an out-of-school science education program. Additionally, we present the initial findings from our interviews with students, college admissions officers, and potential employers regarding the challenges and opportunities of digital badges in a broader context. This work explores the complexity of digital badge system design and implementation, and how badging can be used in out-of-school learning contexts.

51. Connected Learning at the Library: Developing Librarians' Capacity to Support Today's Digital Youth

Katie Davis, Mega Subramaniam, Kelly Hoffman, Ligaya Scaff, and Saba Kawas

Project ConnectedLib aims to build public librarians' capacity to incorporate digital media into their work with youth to promote connections across their learning contexts. We are currently developing customizable professional development resources that support librarians from a broad range of public libraries in their efforts to leverage new media technologies and promote youth's connected learning experiences in libraries. We will disseminate the toolkit widely to libraries serving diverse youth across the country.

52. Learning by Design: Creating Knowledge through Library Storytime Production

J. Elizabeth Mills, Kathleen Campana, and Rachel Ivy Clarke

Librarianship has not traditionally been considered a design practice. However, children's librarians plan, deliver, and reflect on storytimes in implicit ways that may align with design principles. Drawing on empirical data from the VIEWS2 study, this poster asserts that design principles implicitly inform the creation of these library programs for young children. A comparison of models of storytime production and design reveals that key design principles (iteration and reflection) are present throughout storytime production, leading to a new model of storytime design, with implications for library research, practice, and pedagogy as well as design.

53. More Than Form and Function: Developing a Design Course for Graduate Library Education

J. Elizabeth Mills, Rachel Ivy Clarke, Jin Ha Lee, Helene Williams, David G. Hendry, and Jason Yip

Though design thinking and methods have received recent attention in many fields, design is curiously absent from professional library education. LIS curricula should explore the role design can play in librarianship and information science at large to develop accessible, innovative, and user-centered ways to unite patrons with information. The University of Washington Information School offers a course on design methods that explores the use of multimedia tools and virtual collaboration to frame current design practices in librarianship and implement design-based development processes for long-term, patron-focused success.

54. Factors Affecting Young Adult Survivor Engagement in Cancer Advocacy Work

Jordan Eschler and Wanda Pratt

Young adult cancer survivors — those diagnosed between the ages of 15 and 40 — have powerful stories to share in advancing advocacy for improved cancer prevention, detection, and treatment. To help the advocacy community successfully embrace these young survivors, we studied experiential factors leading to success and failure in advocacy engagement with this population. Specifically, we found that intense feelings of stigma around specific cancer diagnoses impeded survivors' long-term engagement with the advocacy community. In contrast, young adult survivors who reported positive relationships with health care professionals, as well as healthy interactions with fellow survivors, were more interested in advocacy work.

55. Our Apps, Our Selves: The Role of Self-Knowledge in Menstrual Tracking

Uba Backonja, Jordan Eschler, Sarah Fox, Amanda Menking, and Pranavi Midathada

Women have charted their menstrual cycles for generations. Many women record menstruation data for self-knowledge (e.g., Lupton, 2015), or to manage social stigma (e.g., Thompson, 2016). With ubiquitous mobile devices, awareness of digital health and zeal for "datafication," women's adoption of menstrual tracking apps is widespread, with hundreds of apps from which to choose (Moglia et al., 2016). In this qualitative study, we assessed free period tracking apps available on Android and iOS platforms by performing a heuristic evaluation of app functions related to essential aspects of self-knowledge for managing women's health and wellbeing in different life phases.

56. Heroes of Their Own Story: How Pediatric Patients Envision Themselves Preventing Medical Error

Shefali Haldar, Sonali R. Mishra, Jordan Eschler, Ari H. Pollack, and Wanda Pratt

In the pediatric hospital setting, parents or guardians act as the primary-decision makers in their child's care. However, the child's viewpoint is often excluded. To uncover opportunities for pediatric patients to play a larger role in their hospitalization, we created a storyboard interview activity. Participants were asked to use a whiteboard, magnets, and markers to illustrate their desired interactions with providers for the purpose of preventing a potential medical error. This elicitation technique will inform the design of an inpatient engagement tool that emphasizes pediatric patients as empowered actors in their hospital care.

57. A Cross-Sectional Study to Understand the Ways Arab Youth Conceptualize Privacy and Identity During Transition from the Arab World to the West

Norah Abokhodair

Theories of privacy and identity in relationship to the use of Information Communication Technology (ICT) have been a topic of research for decades. However, little attention has been paid to the perception of privacy and identity from the perspective of Muslim Arab technology users. In my work, I take a qualitative approach guided by the methodology of Value Sensitive Design (VSD) to investigate how youth from Saudi Arabia conceptualize privacy and identity online in a transnational social field. My findings reveal that in this context, the need and pursuit of privacy stems from the Islamic faith, and the use of paternalistic language by men when discussing women's privacy is common. Above all, privacy is framed as a communal attribute, including not only the individual, but the behavior of those around them; it even extends beyond one's lifespan.

58. Starting a Conversation with the Computer: A Case Study

Ian Sebastian King

In the mid 1960s, batch processing computers were joined by systems in which each query/response pair between user and computer built a conversational context. The Dartmouth Time-Sharing System was one of the first such systems. Why did this idea of conversational interaction originate? This research explores value sensitive design as a lens for answering 'why' questions of technological innovation. The case study draws on both technical description and sources such as science fiction to draw a fuller picture relating the values and visions of the social context to the design and creation of artifacts.

59. Use and Impact of Augmented Reality Games: Pokémon GO and Ingress

Jin Ha Lee and the GAMER Group

Augmented reality games (ARG) have gained great popularity in the past year. We present a series of four studies examining the phenomenon of these location-based games on information behavior of the players. First, we examine how to improve our understanding of how ARGs will impact people's information behaviors in both physical and virtual places, specifically investigating the case of Pokémon GO. Second, we investigate how people collaboratively scientize through Pokémon GO online communities. Third, we examine parental perspectives on a location-based mobile game and the changing nature of screen time. Finally, we study player behavior in augmented reality games through a case study of Ingress.

60. Elucidating User Behavior in Music Services through Persona and Gender

John Fuller, Lauren Hubener, Yea-Seul Kim, and Jin Ha Lee

Prior user studies in the music information retrieval field have identified different personas representing the needs, goals, and characteristics of specific user groups for a user-centered design of music services. However, these personas were derived from a qualitative study involving a small number of participants and their generalizability has not been tested. The objectives of this study are to explore the applicability of seven user personas, developed in prior research, with a larger group of users and to identify the correlation between personas and the use of different types of music services. In total, 962 individuals were surveyed in order to understand their behaviors and preferences when interacting with music streaming services. Using a stratified sampling framework, key characteristics of each persona were extracted to classify users into specific persona groups. Responses were also analyzed in relation to gender, which yielded significant differences. Our findings support the development of more targeted approaches in music services rather than a universal service model.

61. Analyzing Anime Users' Online Forum Queries for Recommendation

Hyerim Cho, Marc Schmalz, Stephen Keating, and Jin Ha Lee

Despite the increasing consumption and popularity of audio-visual materials and non-textual information, recommendation-based information retrieval research regarding these materials remains limited. In order to provide robust recommendation services to users, it is critical to understand how users describe their needs when they seek audio-visual materials. We conducted a content analysis of 396 recommendation threads from Anime News Network online forums to identify 19 common information features used in these requests. Work, Theme, Genre, and Audience were the most significantly mentioned features by users. Altogether, these needs represent a distinct set of interests, vital to understanding seeking behavior for anime.

62. It's Not You, It's Me: Identity, Self–Verification, and Amazon Reviews

Marc Schmalz, Michelle Carter, and Jin Ha Lee

Online retailers often incorporate crowdsourced product reviews to make customers feel more comfortable with online purchases. Evaluation of these reviews is also crowdsourced, ostensibly to identify "helpful" reviews, but there is no evidence that customers attempt to objectively evaluate product reviews. We examine review helpfulness voting from the position of the subjective customer rather than the objective review anatomy. Results suggest that helpfulness voting is influenced by self-verification: the unconscious confirmation of

what users know and believe about themselves. This work contributes to theoretical understanding of the role of product reviews and suggests new ways to identify helpful reviews.

63. Cross-Cultural Differences in Photo Sharing Behavior among Korean and U.S. Students

Jin Ha Lee, Hyerim Cho, and Josh Smith

The goal of this research is to investigate cultural differences in photo sharing behavior by U.S. and South Korean graduate and undergraduate students. This will be accomplished by analyzing a dataset of 9,655 photo sharing events created by students at UW and SNU as part of the iSchool's 2016 South Korea Exploration Seminar. Quantitative analysis of photo subjects revealed cultural differences such as a preference among U.S. students for people over objects and Korean students sharing photos for more functional purposes. Using a codebook based on extant literature and examination of the dataset, researchers are currently coding the motivations for sharing photos.

64. A Survey of Digital Art Collectors' Preservation Needs and Practices

Stephen Keating and Jin Ha Lee

Digital art collection and preservation are a result of the extraordinary growth in scale of works born digitally. The growth of the internet as well as the creative endeavors it engenders has also led to a glut of content without considerable recourse for preservation at either an institutional or an individual level. We surveyed digital art collectors as a first step to understanding user practices with regard to video game digital art collections and preservation practices. The survey focuses on individuals who collect digital art as a core mission in their work and attempts to analyze how they practice preservation.