Matthew Jeremy Shaver Kay mjskay@northwestern.edu • mjskay.com

Research interests

Broadly—Designing/building/evaluating user interfaces and information visualizations.
Lately—Communicating uncertainty to non-experts; building usable statistical tools (for uncertainty visualization, Bayesian analysis, and multiverse analysis); visualization literacy.

I am excited when technology baffles its users. Every new confusion surrounding how a system *is* carries fresh insight into how it *should be*.

Employment

2023–	**Associate Professor** Northwestern University Computer Science and Communication Studies
2020–2023	**Assistant Professor** Northwestern University Computer Science and Communication Studies
2016–2020	**Assistant Professor** University of Michigan School of Information

Education

2010–2016	**PhD, Computer Science & Engineering, University of Washington** Advisors: Julie Kientz and Shwetak Patel Thesis: Designing for user-facing uncertainty in everyday sensing and prediction
2010–2012	**Master of Science, Computer Science & Engineering, University of Washington** Advisors: Julie Kientz and Shwetak Patel
2008–2010	**Master of Mathematics, Computer Science, University of Waterloo** Advisor: Michael Terry Thesis: Techniques and heuristics for improving the visual design of software agreements
2004–2008	**Bachelor of Computer Science, University of Waterloo** Minor in Fine Art (Studio Specialization) Honours with Distinction

Awards & honours

2024	**Best Paper Award for "In dice we trust ..." (CHI 2024)**
2024	**Best Paper Honorable Mention for "Watching the election sausage get made ..." (CHI 2024)**
2024	**Best Paper Honorable Mention for "Odds and insights ..." (CHI 2024)**
2024	**Best Paper Honorable Mention for "Authors' values and attitudes ..." (CHI 2024)**

2023	**IEEE VGTC Visualization Significant New Researcher Award**
2023	**Best Paper Award for "Swaying the public? …" (VIS 2023)**
2023	**Best Paper Honorable Mention for "CALVI …" (CHI 2023)**
2023	**Best Paper Honorable Mention for "Subjective probability correction…" (CHI 2023)**
2023	**Best Paper Honorable Mention for "multiverse …" (CHI 2023)**
2022	**NSF CISE Medium: PIs: Matthew Kay, Jessica Hullman ~$1.2M (~$600k each)**
2022	**CRA CI Fellowship for post-doc Fumeng Yang: (~$120k/year for two years)**
2022	**Best Paper Honorable Mention for "Evaluating the use …" (VIS 2022)**
2020	**Best Paper Award for "Visual reasoning strategies …" (InfoVis 2020)**
2020	**Best Paper Honorable Mention for "A probabilistic grammar of graphics" (CHI 2020)**
2019	**NSF CISE Small #1910431: PI: Matthew Kay, ~$500k**
2019	**Best Paper Award for "Increasing the transparency of research papers …" (CHI 2019)**
2018	**NSF CISE Small #1815790: PIs: Matthew Kay, Lane Harrison, ~$500k (~$250k each)**
2018	**Best Paper Honorable Mention for "Uncertainty displays …" (CHI 2018)**
2016	**Best Paper Award for "Mobile manifestations of alertness …" (MobileHCI 2016)**
2016	**Best Paper Honorable Mention for "Researcher-centered design of statistics …" (CHI 2016)**
2015	**Best Paper Honorable Mention for "Beyond Weber's Law …" (InfoVis 2015)**
2015	**Best Paper Award for "Unequal representation and gender stereotypes …" (CHI 2015)**
2013	**Best Paper Award for "There's no such thing as gaining a pound …" (UbiComp 2013)**
2012	**Best Paper Award for "Lullaby: A capture & access system …" (UbiComp 2012)**
2011–2013	**NSERC Postgraduate Scholarship (Doctoral)**
2008–2010	**NSERC Alexander Graham Bell Canada Graduate Scholarship (Master's)**
2008–2010	**President's Graduate Scholarship, University of Waterloo**
2008	**NSERC Undergraduate Student Research Assistantship**
2004–2008	**Descartes Scholarship, University of Waterloo**

Publications

Authors whose names are underlined were students at the time of publication.

—— Journal articles (fully reviewed, archival)

J19 ☀ 2024 **Swaying the public? Impacts of election forecast visualizations on emotion, trust, and intention in the 2022 U.S. midterms**
Fumeng Yang, Mandi Cai, Chloe Rose Mortenson, Hoda Fakhari, Ayse Deniz Lokmanoglu, Jessica Hullman, Steven L Franconeri, Nicholas Diakopoulos, Erik Nisbet, and *Matthew Kay*
IEEE Transactions on Visualization and Computer Graphics (proc. VIS 2023)
Best paper award

J18 2024 **ggdist: Visualizations of distributions and uncertainty in the grammar of graphics**
Matthew Kay
IEEE Transactions on Visualization and Computer Graphics (proc. VIS 2023)

J17 2024 **Adaptive assessment of visualization literacy**
Yuan Cui, Lily W. Ge, Yiren Ding, Fumeng Yang, Lane Harrison, and *Matthew Kay*
IEEE Transactions on Visualization and Computer Graphics (proc. VIS 2023)

J16 ☀ 2023 **Evaluating the use of uncertainty visualisations for imputations of data missing at random in scatterplots**
Abhraneel Sarma, Shunan Guo, Jane Hoffswell, Ryan Rossi, Fan Du, Eunyee Koh, and *Matthew Kay*
IEEE Transactions on Visualization and Computer Graphics 29(1) (proc. VIS 2022)
Best paper honorable mention (top 5%)

J15 2022 **The risks of ranking: Revisiting graphical perception to model individual differences in visualization performance**
Russell Davis, Xiaoying Pu, Yiren Ding, Brian D Hall, Karen Bonilla, Mi Feng, *Matthew Kay*, and Lane Harrison
IEEE Transactions on Visualization and Computer Graphics

J14 2022 **A survey of tasks and visualizations in multiverse analysis reports**
Brain D Hall, Yang Liu, Yvonne Jansen, Pierre Dragicevic, Fanny Chevalier, *Matthew Kay*
Computer Graphics Forum 41 (1)

J13 2021 **Evaluating Michigan's administrative rule change on nonmedical vaccine exemptions**
Nina B Masters, Jon Zelner, Paul L Delamater, David Hutton, *Matthew Kay*, Marisa C Eisenberg, and Matthew L Boulton
Pediatrics 148 (3)

J12 2021 **Fine-scale spatial clustering of measles nonvaccination that increases outbreak potential is obscured by aggregated reporting data**
Nina B Masters, Marisa C Eisenberg, Paul L Delamater, *Matthew Kay*, Matthew L Boulton, and Jon Zelner
Proceedings of the National Academy of Sciences 117 (45)

J11 ☀ 2021 **Visual reasoning strategies for effect size judgments and decisions**
Alex Kale, *Matthew Kay*, and Jessica Hullman
IEEE Transactions on Visualization and Computer Graphics (proc. INFOVIS 2020)
Best paper award (top 1 paper)

J10 2021 **Revealing perceptual proxies with adversarial examples**
Brian D Ondov, Fumeng Yang, *Matthew Kay*, Niklas Elmqvist, and Steven Franconeri
IEEE Transactions on Visualization and Computer Graphics (proc. INFOVIS 2020)

J09	2020	**Uncertain about uncertainty: How qualitative expressions of forecaster confidence impact decision-making with uncertainty visualizations** Lace Padilla, Maia Powell, *Matthew Kay*, Jessica Hullman Frontiers in Psychology 11
J08	2019	**In pursuit of error: A survey of uncertainty visualization evaluation** Jessica Hullman, Xiaoli Qiao, Michael Correll, Alex Kale, and *Matthew Kay* IEEE Transactions on Visualization and Computer Graphics 25(1) (proc. INFOVIS 2018)
J07	2019	**Hypothetical outcome plots help untrained observers judge trends in ambiguous data** Alex Kale, Francis Nguyen, *Matthew Kay*, and Jessica Hullman IEEE Transactions on Visualization and Computer Graphics 25(1) (proc. INFOVIS 2018)
J06	2018	**Addressing the need for validation of a touchscreen psychomotor vigilance task: important considerations for sleep health research** Michael Grandner, Nathaniel Watson, *Matthew Kay,* Demi Ocaño, and Julie Kientz Sleep Health 4(5)
J05	2018	**A patient-centered proposal for Bayesian analysis of self-experiments for health** Jessica Schroeder, Ravi Karkar, James Fogarty, Julie Kientz, Sean Munson, and *Matthew Kay* Journal of Healthcare Informatics Research (2018)
J04	2018	**Imagining replications: Graphical prediction & discrete visualizations improve recall & estimation of effect uncertainty** Jessica Hullman, *Matthew Kay*, Yea-Seul Kim, and Samana Shrestha IEEE Transactions on Visualization and Computer Graphics 24(1) (proc. INFOVIS 2017)
J03	2017	**Semi-automated tracking: A balanced approach for self-monitoring applications** Eun Kyoung Choe, Saeed Abdullah, Mashfiqui Rabbi, Edison Thomaz, Daniel A. Epstein, *Matthew Kay*, Felicia Cordeiro, Gregory D. Abowd, Tanzeem Choudhury, James Fogarty, Bongshin Lee, Mark Matthews, and Julie A. Kientz IEEE Pervasive Computing 16(1), 1536–1268
J02 ✳	2016	**Beyond Weber's Law: A second look at ranking visualizations of correlation** *Matthew Kay* and Jeffrey Heer IEEE Transactions on Visualization and Computer Graphics 22(1) (proc. INFOVIS 2015) Best paper honorable mention (top 2 papers)
J01	2015	**Consumer sleep technologies: A review of the landscape** Ping-Ru T Ko, Julie A Kientz, Eun Kyoung Choe, *Matthew Kay*, Carol A Landis, and Nathaniel F Watson JCSM: Journal of clinical sleep medicine 11(12), 1455–1461
———		Conference papers (fully reviewed, archival)
C35 ✳	2024	**In dice we trust: Uncertainty displays for maintaining trust in election forecasts over time** Fumeng Yang, Chloe Rose Mortenson, Erik Nisbet, Nicholas Diakopoulos, and *Matthew Kay* CHI '24: Conference on human factors in computing systems Best paper award (top 1%)

C34 ⚙ 2024 **Watching the election sausage get made: How data journalists visualize the vote counting process in U.S. elections**
Mandi Cai and *Matthew Kay*
CHI '24: Conference on human factors in computing systems
Best paper honorable mention (top 5%)

C33 2024 **Milliways: Taming multiverses through principled evaluation of data analysis paths**
Abhraneel Sarma, Kyle Hwang, Jessica Hullman, and *Matthew Kay*
CHI '24: Conference on human factors in computing systems

C32 ⚙ 2024 **Odds and insights: Decision quality in exploratory data analysis under uncertainty**
Abhraneel Sarma, Xiaoying Pu, Yuan Cui, Eli T Brown, Michael Correll, and *Matthew Kay*
CHI '24: Conference on human factors in computing systems
Best paper honorable mention (top 5%)

C31 2024 **To cut or not to cut? A systematic exploration of y-axis truncation**
Sheng Long and *Matthew Kay*
CHI '24: Conference on human factors in computing systems

C30 ⚙ 2024 **Authors' values and attitudes towards AI-bridged scalable personalization of creative language arts**
Taewook Kim, Hyomin Han, Eytan Adar, *Matthew Kay*, and John Joon Young Chung
CHI '24: Conference on human factors in computing systems
Best paper honorable mention (top 5%)

C29 2024 **V-FRAMER: Visualization framework for mitigating reasoning errors in public policy**
Lily W Ge, Matthew Easterday, *Matthew Kay*, Evanthia Dimara, Peter Cheng, and Steven L Franconeri
CHI '24: Conference on human factors in computing systems

C28 ⚙ 2023 **CALVI: Critical thinking assessment for literacy in visualizations**
Lily W Ge, Yuan Cui, and *Matthew Kay*
CHI '23: Conference on human factors in computing systems
Best paper honorable mention (top 5%)

C27 2023 **How data analysts use a visualization grammar in practice**
Xiaoying Pu and *Matthew Kay*
CHI '23: Conference on human factors in computing systems

C26 ⚙ 2023 **Subjective probability correction for uncertainty representations**
Maryam Hedayati, Fumeng Yang, and *Matthew Kay*
CHI '23: Conference on human factors in computing systems
Best paper honorable mention (top 5%)

C25 ⚙ 2023 **multiverse: Multiplexing alternative data analyses in R notebooks**
Abhraneel Sarma, Alex Kale, Michael Jongho Moon, Nathan Taback, Fanny Chevalier, Jessica Hullman, and *Matthew Kay*
CHI '23: Conference on human factors in computing systems
Best paper honorable mention (top 5%)

C24   2023   **"It can bring you in the right direction": Episode-driven data narratives to help patients navigate multidimensional diabetes data to make care decisions**
<u>Shriti Raj</u>, <u>Toshi Gupta</u>, Joyce Lee, *Matthew Kay*, and Mark W Newman
CHI '23: Conference on human factors in computing systems

C23   2021   **An aligned rank transform procedure for multifactor contrast tests**
<u>Lisa A Elkin</u>, *Matthew Kay*, James J Higgins, Jacob O Wobbrock
UIST '21: Symposium on User Interface Software and Technology

C22 ⚙ 2020   **A probabilistic grammar of graphics**
<u>Xiaoying Pu</u> and *Matthew Kay*
CHI '20: Conference on human factors in computing systems
Best paper honorable mention (top 5%)

C21   2020   **Prior setting in practice: Strategies and rationales used in choosing prior distributions for Bayesian analysis**
<u>Abhraneel Sarma</u> and *Matthew Kay*
CHI '20: Conference on human factors in computing systems

C20   2020   **How patterns of students dashboard use are related to their achievement and self-regulatory engagement**
<u>Fatemeh Salehian Kia</u>, Stephanie D Teasley, Marek Hatala, Stuart A Karabenick, and *Matthew Kay*
LAK '20: Conference on learning analytics & knowledge

C19 ⚙ 2019   **Increasing the transparency of research papers with explorable multiverse analyses**
Pierre Dragicevic, Yvonne Jansen, <u>Abhraneel Sarma</u>, *Matthew Kay*, and Fanny Chevalier
CHI '19: Conference on human factors in computing systems
Best paper award (top 1%)

C18   2019   **Some prior(s) experience necessary: Templates for getting started with Bayesian analysis**
<u>Chanda Phelan</u>, Jessica Hullman, *Matthew Kay*, and Paul Resnick
CHI '19: Conference on human factors in computing systems

C17   2019   **Decision-making under uncertainty in research synthesis: Designing for the garden of forking paths**
<u>Alex Kale</u>, *Matthew Kay*, and Jessica Hullman
CHI '19: Conference on human factors in computing systems

C16   2018   **The garden of forking paths in visualization: A design space for reliable exploratory visual analytics**
<u>Xiaoying Pu</u> and *Matthew Kay*
BELIV '18: Evaluation and Beyond - Methodological Approaches for Visualization

C15 ⚙ 2018   **Uncertainty displays using quantile dotplots or CDFs improve transit decision-making**
<u>Michael Fernandes</u>, <u>LoganWalls</u>, Sean Munson, Jessica Hullman, and *Matthew Kay*
CHI '18: Conference on human factors in computing systems
Best paper honorable mention (top 5%)

C14   2017   **Self-experimentation for behavior change: Design and formative evaluation of two approaches**
<u>Jisoo Lee</u>, Erin Walker, Winslow Burleson, *Matthew Kay*, Matthew P. Buman, and Eric B. Hekler
CHI '17: Conference on human factors in computing systems

C13   2016   **Cognitive rhythms: Unobtrusive and continuous sensing of alertness using a mobile phone**
Saeed Abdullah, Elizabeth Murnane, Mark Matthews, *Matthew Kay*,
Julie Kientz, Geri Gay, and Tanzeem Choudhury
UBICOMP '16: Conference on ubiquitous computing

C12 ✺ 2016   **Mobile manifestations of alertness: Connecting biological
rhythms with patterns of smartphone app use**
Elizabeth Murnane, Saeed Abdullah, Mark Matthews, *Matthew Kay*, Julie
Kientz, Geri Gay, Tanzeem Choudhury, and Dan Cosley
MOBILEHCI '16: Conference on Human–Computer Interaction with Mobile Devices and Services
Best paper award (top 2 papers)

C11 ✺ 2016   **Researcher-centered design of statistics: Why Bayesian
statistics better fit the culture and incentives of CHI**
Matthew Kay, Gregory Nelson, and Eric Hekler
CHI '16: Conference on human factors in computing systems, 23% AR
Best paper honorable mention (top 5%)

C10   2016   **When (ish) is my bus? User-centered visualizations of
uncertainty in everyday, mobile predictive systems**
Matthew Kay, Tara Kola, Jessica Hullman, and Sean Munson
CHI '16: Conference on human factors in computing systems, 23% AR

C09   2015   **SleepTight: Low-burden, self-monitoring technology for
capturing and reflecting on sleep behaviors**
Eun Kyoung Choe, Bongshin Lee, *Matthew Kay*, Wanda Pratt, and Julie A. Kientz
UBICOMP '15: Conference on ubiquitous computing, 30% AR

C08 ✺ 2015   **Unequal representation and gender stereotypes in image search results for occupations**
Matthew Kay, Cynthia Matuszek, and Sean Munson
CHI '15: Conference on human factors in computing systems, 23% AR
Best paper award (top 1%)

C07   2015   **How good is 85%? A survey tool to connect classifier evaluation to acceptability of accuracy**
Matthew Kay, Shwetak N. Patel, and Julie A. Kientz
CHI '15: Conference on human factors in computing systems, 23% AR

C06 ✺ 2013   **There's no such thing as gaining a pound: Reconsidering the bathroom scale user interface**
Matthew Kay, Dan Morris, mc schraefel, and Julie A. Kientz
UBICOMP '13: Conference on ubiquitous computing, 23% AR
Best paper award (top 1%)

C05   2013   **PVT-Touch: Adapting a reaction time test for touchscreen devices**
Matthew Kay, Kyle Rector, Sunny Consolvo, Ben Greenstein,
Jacob O. Wobbrock, Nathaniel F. Watson, and Julie A. Kientz
PERVASIVEHEALTH '13: Conference on pervasive computing technologies for healthcare, 34% AR

C04 ✺ 2012   **Lullaby: A capture & access system for understanding the sleep environment**
Matthew Kay, Eun Kyoung Choe, Jesse Shepherd, Benjamin Greenstein,
Nathaniel F. Watson, Sunny Consolvo, and Julie A. Kientz
UBICOMP '12: Conference on ubiquitous computing, 19% AR
Best paper award (top 1%)

C03	2010	**Textured agreements: Re-envisioning electronic consent**
		Matthew Kay and Michael Terry
		SOUPS '10: Symposium on usable privacy and security, 25% AR

C02	2010	**Perceptions and practices of usability in the Free/Open Source Software (FOSS) community**
		Michael Terry, *Matthew Kay*, and Ben Lafreniere
		CHI '10: Conference on human factors in computing systems, 22% AR

C01	2008	**Ingimp: Introducing instrumentation to an end-user open source application**
		Michael Terry, *Matthew Kay*, Brad Van Vugt, Brandon Slack, and Terry Park
		CHI '08: Conference on human factors in computing systems, 22% AR

—— Book chapters

B03	2021	**User-centered design for a student-facing dashboard grounded in learning theory**
		Stephanie D. Teasley, *Matthew Kay*, Shannon Elkins, Jackson Hammond
		in Visualizations and Dashboards for Learning Analytics, eds. Muhittin Sahin, Dirk Ifenthaler
		Springer

B02	2020	**Uncertainty visualization**
		Lace Padilla, *Matthew Kay*, Jessica Hullman
		in Wiley StatsRef: Statistics Reference Online, eds. N. Balakrishnan, T.
		Colton, B. Everitt, W. Piegorsch, F. Ruggeri and J.L. Teugels

B01	2016	**Nonparametric statistics in human–computer interaction**
		Jacob O. Wobbrock and *Matthew Kay*
		in Modern Statistical Methods for HCI, eds. Judy Robertson and Maurits Kaptein
		Springer International Publishing

—— Magazine articles

M02	2017	**How do you know if 85% accuracy is good enough for your application?**
		Matthew Kay, Shwetak N. Patel, and Julie A. Kientz
		GETMOBILE: Mobile Computing and Communications 21(2), 5–8

M01	2014	**Challenges in personal health tracking: The data isn't enough**
		Matthew Kay
		XRDS: Crossroads, the ACM Magazine for Students 21(2), 32–37

—— Workshop papers & abstracts (lightly reviewed)

A07	2019	**Designing for preregistration: A user-centered perspective**
		Xiaoying Pu, Licheng Zhu, *Matthew Kay*, and Frederick Conrad
		CHI '19 extended abstracts

A06	2017	**Validation of a touchscreen psychomotor vigilance task for Android devices**
		Demi Ocano, Nathaniel F. Watson, *Matthew Kay*, Julie A. Kientz, and Michael Grandner
		SLEEP 40 (Abstract supplement): A88

A05	2013	**Initial validation of an Android-based psychomotor vigilance task**
		Matthew Kay, Michael Grandner, Jared Bauer, Rebecca Lang,
		Nathaniel F. Watson, and Julie A. Kientz
		SLEEP 36 (Abstract supplement)

| A04 | 2012 | **Evaluating Zeo and Fitbit for tracking sleep behaviors**
Matthew Kay, <u>Eun Kyoung Choe</u>, and Julie A. Kientz
UBICOMP '12 workshop on evaluating off-the-shelf technologies for personal health monitoring |

| A03 | 2012 | **Lullaby: Capturing the unconscious in the sleep environment**
Matthew Kay, <u>Eun Kyoung Choe</u>, <u>Jesse Shepherd</u>, Benjamin Greenstein,
Nathaniel F. Watson, Sunny Consolvo, and Julie A. Kientz
CHI '12 workshop on personal informatics |

| A02 | 2011 | **Lullaby: Environmental sensing for sleep self-improvement**
Matthew Kay, <u>Eun Kyoung Choe</u>, <u>Jesse Shepherd</u>, Benjamin Greenstein,
Sunny Consolvo, <u>Patrick Gage Kelley</u>, and Julie A. Kientz
CHI '11 workshop on personal informatics |

| A01 | 2010 | **Communicating software agreement content using narrative pictograms**
Matthew Kay and Michael Terry
ALT.CHI '10 (CHI '10 extended abstracts) |

——— Other articles

| O02 | 2013 | **Ubicomp 2012 conference report**
<u>Sidhant Gupta</u> and *Matthew Kay*
IEEE Pervasive Computing 12(1) |

| O01 | 2012 | **The changing nature of (ubiquitous) computing**
Matthew Kay
XRDS blogs, in Crossroads, the ACM Magazine for Students 19(1) |

——— Posters

| P02 | 2014 | **How good is 85%? Connecting classifier performance to acceptability of accuracy**
Matthew Kay, Shwetak N. Patel, and Julie A. Kientz
HCIC '14: Human Computer Interaction Consortium Workshop |

| P01 | 2009 | **Textured agreements: Re-envisioning electronic consent**
Matthew Kay and Michael Terry
SOUPS '09: Symposium on usable privacy and security |

R packages

| R05 | 2021– | **posterior: Tools for working with posterior distributions**
Paul-Christian Bürkner, Jonah Gabry, *Matthew Kay,* Aki Vehtari
https://mc-stan.org/posterior/ | https://cran.r-project.org/package=posterior |

| R04 | 2021– | **multiverse: Explorable multiverse data analysis and reports**
Abhraneel Sarma, Michael Moon, *Matthew Kay,* Alex Kale, Nathan Taback,
Fanny Chevalier, Jessica Hullman, Pierre Dragicevic, Yvonne Jansen
https://mucollective.github.io/multiverse/ | https://cran.r-project.org/package=multiverse |

| R03 | 2020– | **ggdist: Visualizations of distributions and uncertainty**
Matthew Kay
https://mjskay.github.io/ggdist/ | https://cran.r-project.org/package=ggdist |

RO2   2015–   **tidybayes: Bayesian analysis + tidy data + geoms**
Matthew Kay
https://mjskay.github.io/tidybayes/ | https://cran.r-project.org/package=tidybayes

RO1   2014–   **ARTool: R package for aligned rank transform for nonparametric factorial ANOVAs**
Matthew Kay and Jacob O. Wobbrock
https://cran.r-project.org/package=ARTool

Publicly available research code & data

Since about 2014 I have made it a habit to release datasets and analysis code (in R) with all papers where I am first author. Previous work may not have ethics approval for this. Most of the code for later papers with students not listed here is also publicly available (see the papers).

2018   **Data and analysis for "Uncertainty displays ..." [C15]**
Michael Fernandes, Logan Walls, Sean Munson, Jessica Hullman, and *Matthew Kay*
https://github.com/Michael-Fernandes/uncertainty-displays-for-transit

2017   **Materials for "Imagining replications ..." [J04]**
Jessica Hullman, *Matthew Kay*, Yea-Seul Kim, and Samana Shrestha
https://github.com/jhullmanuw/imagining_replications_infovis2017

2016   **Data and analysis for "Research-centered design of statistics ..." [C11]**
Matthew Kay, Gregory Nelson, and Eric Hekler
https://github.com/mjskay/bayes-for-chi

2016   **Data and analysis for "When (ish) is my bus? ..." [C10]**
Matthew Kay, Tara Kola, Jessica Hullman, and Sean Munson
https://github.com/mjskay/when-ish-is-my-bus

2015   **Data and analysis for "Beyond Weber's Law ..." [J02]**
Matthew Kay and Jeffrey Heer
https://github.com/mjskay/ranking-correlation

2015   **Data and analysis for "Unequal representation and gender stereotypes ..." [C08]**
Matthew Kay, Cynthia Matuszek, and Sean Munson
https://github.com/mjskay/gender-in-image-search

2015   **Code for "How good is 85%? A survey tool ..." [C07]**
Matthew Kay, Shwetak N. Patel, and Julie A. Kientz
https://github.com/mjskay/acceptability-of-accuracy

Talks & panels

All first-author conference papers listed above were also given as presentations at their respective conferences and are not listed again in this section.

——— Invited talks

2022   **Visualizing multiverse analyses**
Multiverse workshop at SIPS (Society for the Improvement of Psychological Science) 2022

2021   **A biased tour of the uncertainty visualization zoo**
Lawrence Livermore National Laboratory | https://youtu.be/eyLxh_YY3Hw

2021   **Uncertainty visualization with tidybayes and ggdist**
Bayes@Lund | https://youtu.be/EtrmxMX8zWw

2021   **Strategies for effective uncertainty visualization**
Nonclinical Biostatistics Conference 2021

2021   **Strategies for effective uncertainty visualization**
Rostock Retreat, Max Plank Insitute for Demographic Research

2021   **Uncertainty visualization as a moral imperative**
BostonCHI | https://www.youtube.com/watch?v=mfQ3QVyw4N0

2020   **Uncertainty visualization and Bayes**
Generable | https://www.youtube.com/watch?v=PqCaljvE89k

2020   **Building effective uncertainty visualizations with tidybayes and ggdist**
StanCon 2020 | https://www.youtube.com/watch?v=wbzfqh_3LyM

2019   **Uncertainty visualization as a moral imperative**
Northwestern University Technology and Social Behavior Speaker Series

2019   **tidybayes: Tidy data + Bayesian analysis + geoms**
Ann Arbor R Users Group

2018   **A biased tour of the uncertainty visualization zoo**
Tapestry 2018 | https://www.youtube.com/watch?v=E1kSnWvqCw0

2018   **Tidy data and Bayesian analysis make uncertainty visualization fun**
OpenVisConf 2018 | https://www.youtube.com/watch?v=vqzO-9LS0G4

2018   **Uncertainty visualization for scientific communication**
Psychology Methods Hour, University of Michigan

2018   **Discrete outcome uncertainty visualization**
Center for Bioethics and Social Sciences in Medicine, University of Michigan

2014   **On weight scales, sensing, and accuracy: Improving the user interface
of user-facing uncertainty in ubiquitous computing**
University of Waterloo

2013   **Personal informatics & sleep**
UW CSE Summer Academy for Advancing Deaf & Hard of Hearing in Computing

2012   **Lullaby: A capture and access system for the sleep environment**
UW CSE Industry Affiliates' Day 2012

———   Course guest lectures

2021   **Introduction to uncertainty visualization**
PSYCH 252: Graduate-level statistical methods (Stanford)

2017–2019	**Information visualization for data science**
	BDSI 2019: Big Data Summer Institute at the University of Michigan
	BDSI 2018: Big Data Summer Institute at the University of Michigan
	BDSI 2017: Big Data Summer Institute at the University of Michigan

2018	**Visualization for scientific communication**
	EHS 869: Doctoral seminar on scientific presentation and communication

2017,2018	**Visualization for scientific communication**
	NUTR 802: Professional development and technical writing

2016	**Quantitative methods**
	ARTDES 650.1: Research Methods

2014	**Critique**
	CSE 440: User Interface Design, Prototyping, and Evaluation

2014	**Designing for mobile web, responsive web, and mobile apps**
	HCID 520: User Interface Software and Technology

2013	**Challenges in personal informatics**
	CSE 440: Introduction to HCI

—— Discussion panels

2020	**A picture is worth a thousand stories: Visualizing COVID-19**
	with Jessica Hullman
	Northwestern Buffett Institute for Global Affairs│ http://youtu.be/lVvBzMs-AnU

2018	**Frontiers of data visualization**
	with Martin Wattenberg, Michelle Borkin, and Arvind Satyanarayan
	MIT Statistics and Data Science Convention 2018 │ http://youtu.be/zd97cxduPgM

2018	**Increasing replicability: Emerging tools and associated challenges**
	with Nick Michalak and Yilin Wang
	American Psychological Association 2018 Conference

2016	**How can we improve empirical research on understanding visual information?**
	with Steve Haroz, Pierre Dragicevic, Ronald Rensink, and Jessica Hullman
	InfoVis 2016

2014	**Research design and collaboration**
	with Jason Bobe and Eric Hekler
	Quantified Self Public Health Symposium 2014

Advising

—— Current Postdocs

Fumeng Yang, Northwestern University

—— Former Postdocs

Alireza Karduni, Northwestern University (with Jessica Hullman and Steven Franconeri)

—— Current PhD students

Mandi Cai, Northwestern University Technology and Social Behavior

Taewook Kim, Northwestern University Technology and Social Behavior

Lily Ge, Northwestern University Computer Science

Sheng Long, Northwestern University Computer Science

Yuan Cui, Northwestern University Computer Science

Maryam Hedayati, Northwestern University Computer Science + Learning Science

Abhraneel Sarma, Northwestern University Computer Science (with Jessica Hullman)

Brian Hall, University of Michigan School of Information

—— Former PhD students

Xiaoying Pu, University of Michigan Computer Science and Engineering

—— Doctoral qualifier / prelim committee member

2021 **Dongping Zhang, Northwestern University Computer Science**

2021 **Priyanka Nanayakkara, Northwestern University Computer Science**

2021 **Hyeok Kim, Northwestern University Technology and Social Behavior**

2018 **Heeryung Choi, University of Michigan School of Information**

2018 **Brian Hall, University of Michigan School of Information**

2018 **Carl Haynes, University of Michigan School of Information**

2018 **Shiqing He, University of Michigan School of Information**

2017 **Hariharan Subramonyam, University of Michigan School of Information**

—— Master's thesis chair

2018 **Abhraneel Sarma, University of Michigan School of Information**

—— Master's thesis committee member

2018 **Josh Gardner, University of Michigan School of Information**

—— Other Master's students mentored in research

2018 **Ruchi Ookalkar, University of Michigan School of Information**

2018–2019 **Puhe Liang, University of Michigan School of Information**

—— Undergraduate student mentor

2021 **Daniel Wang, Northwestern University Computer Science**

2018–2019 **Dillon Zaugg, University of Michigan Computer Science and Engineering**

—— Computing Research Association Distributed Research
Experiences for Undergraduates (DREU) mentor

2016 **Tara Kola, Tufts University (mentored at University of Washington)**

13

Service

—— To the research community

2022–2023 **CHI Visualization Paper Subcommittee Co-chair**

2020 **BELIV Workshop Co-organizer**

2016 **ACM Interactions Editor-in-Chief Search Committee Member**

2015–2016 **CSCW 2016 Co-webmaster**

2014 **UbiComp 2014 Program Committee Student Volunteer**

—— As a conference workshop or special interest group (SIG) organizer

W07 **2021** **Special Interest Group on Visualization Grammars**
Xiaoying Pu, *Matthew Kay*, Steven M Drucker, Jeffrey
Heer, Dominik Moritz, Arvind Satyanarayan
SIG at CHI '21

W06 **2018** **Special Interest Group on Transparent Statistics Guidelines**
Chat Wacharamanotham, *Matthew Kay*, Steve Haroz, Shion Guha, and Pierre Dragicevic
SIG at CHI '18 | https://transparentstatistics.org/chi2018/

W05 **2017** **Moving Transparent Statistics Forward at CHI**
Matthew Kay, Steve Haroz, Shion Guha, Pierre Dragicevic, and Chat Wacharamanotham
Workshop at CHI '17 | https://transparentstatistics.org/chi2017/

W04 **2017** **Designing for Uncertainty in HCI: When Does Uncertainty Help?**
Miriam Greis, Jessica Hullman, *Matthew Kay*, Michael Correll, and Orit Shaer
Workshop at CHI '17 | http://visualization.ischool.uw.edu/hci_uncertainty/

W03 **2016** **Special Interest Group on Transparent Statistics in HCI**
Matthew Kay, Steve Haroz, Shion Guha, and Pierre Dragicevic
SIG at CHI '16 | https://transparentstatistics.org/chi2016/

W02 **2014** **Disasters in personal informatics: The unpublished stories of failure and lessons learned**
Jon E. Froehlich, Jakob Eg Larsen, *Matthew Kay*, and Edison Thomaz
Workshop at UBICOMP '14

W01 **2014** **Biological rhythms and technology**
Mark Matthews, Erin Carroll, Saeed Abdullah, Jaime Snyder, *Matthew Kay,*
Tanzeem Choudhury, Geri Gay, and Julie A. Kientz
Workshop at CHI '14

—— At Northwestern University

2022 **School of Communication Arts Strategy Advisory Committee member**

2022 **Computer Science CS+X postdoc search committee member**

2021 **Communication Studies HCI faculty search committee member**

2020–2021 **Technology and Social Behavior PhD admissions committee member**

2020 **Computer Science PhD admissions committee member**

2020 **Computer Science teaching postdoc search co-chair**

——	At University of Michigan
2018–2020	**ArtsEngine faculty representative for the School of Information**
2018	**oSTEM (Out in Science Technology, Engineering, and Math) LGBTQ faculty panel member**
2017–2018	**MISC (Michigan Interactive and Social Computing) seminar co-organizer**
2017	**Speaker at CS KickStart program to introduce first year women to Computer Science**
2017	**SIGCHI Chapter Faculty Mentor**
——	At University of Michigan School of Information
2018–2019	**Data Science Faculty Search Committee Member**
2018	**Bachelor's Program Committee Member**
2017–2018	**Doctoral Program Committee Member**
——	At University of Washington CSE
2014–2015	**dub Speaker Series Student Committee Member** Responsible for coordinating speakers for the weekly dub group HCI speaker series
SPRING 2015	**Paul Allen Computing Challenge Judge** Judged ~30 personal informatics-related research posters from high school student teams
WINTER 2014	**Prospective Graduate Student Admissions Reviewer** Reviewed prospective graduate student applications for UW CSE
SUMMER 2013	**Speaker at Summer Academy for Advancing Deaf & Hard of Hearing in Computing** Presented research to deaf and hard of hearing high school students
SPRING 2013	**Graduate Student Satisfaction Survey Coordinator** Organized the annual survey of grad student happiness and reported on its results
SPRING 2012	**Prospective Student Committee After-party Coordinator** Organized after-party for visiting prospective grad students
FALL 2011	**New Graduate Student Orientation Co-coordinator** Organized panels, talks, and activities to introduce new students to UW CSE and Seattle
SPRING 2011	**Prospective Student Committee Graduate Student Whip** Ensured graduate students scheduled time to meet prospectives
——	At University of Waterloo CS
SPRING 2010	**Human–Computer Interaction Tutorial Leader** Designed and ran two intoductory HCI tutorials for high school girls interested in CS
——	As a conference program subcommittee chair / area chair
2024	IEEE VIS Theroetical & Empirical area co-chair
2022–2023	ACM CHI Visualization subcommittee co-chair
——	As a conference program committee member
2021–2022	IEEE VIS

2020–2021	ACM CHI
2019	ACM FAT*
2018	ACM CHI
————	As a reviewer (for conferences)
✹	Special Recognitions for exceptional reviews.
2013–2024	CHI ✹ (2016) ✹ (2018) ✹ ✹ (2019) ✹ ✹ ✹ (2021) ✹ (2024)
2016–2023	IEEE VIS ✹ ✹ ✹ (2023)
2016–2022	BELIV
2016–2021	CSCW ✹ (2016) ✹ (2017)
2017–2021	EuroVis
2015–2020	UIST ✹ (2015) ✹ (2016)
2019	FAT*
2016–2018	MobileHCI
2017	Digital Health
2013–2017	CHI Works-in-Progress / Late-Breaking Work
2016	HealthWear
2014–2016	UbiComp
2014	Pervasive Health
2010	GI
————	As a reviewer (for journals)
2017–2021	IEEE Transactions on Visualization and Computer Graphics
2017–2020	ACM IMWUT ✹ (2020)
2018–2019	ACM TOCHI
2017	Risk Analysis
2016	Human–Computer Interaction
2016	Human Factors
2015	IEEE Pervasive Computing

Press

2020	**Forecast Election Results With Presidential Plinko**
	Lifehacker, David Murphy, Oct 8 2020, https://lifehacker.com/forecast-election-results-with-presidential-plinko-1845313040

2019   **Visualizing Uncertainty with Jessica Hullman and Matthew Kay**
Data Stories Podcast, Enrico Bertini and Moritz Stefaner, Jan 2019,
http://datastori.es/134-visualizing-uncertainty-with-jessica-hullman-and-matthew-kay/

2015   **For "Unequal representation and gender stereotypes ..." [C08]**
The New York Times, Claire Cain Miller, When algorithms
discriminate, Jul 9 2015, http://nyti.ms/1JX8Wwv

CBC Radio Spark, Nora Young, Women at work in image
search, May 3 2015, http://www.cbc.ca/1.3057841

Fast Company, Lydia Dishman, The hidden gender bias in Google image
search, Apr 22 2015, http://www.fastcompany.com/3045295/strong-
female-lead/the-hidden-gender-bias-in-google-image-search

BBC Newsbeat, Amelia Butterly, Google image search for CEO has Barbie as first
female result, Apr 16 2015, http://www.bbc.co.uk/newsbeat/article/32332603/
google-image-search-for-ceo-has-barbie-as-first-female-result

@ChelseaClinton, What happens when you Google image search "CEO"?
10 rows down you find the first female face–Barbie, Apr 15 2015, https://
twitter.com/ChelseaClinton/status/588394572545466369

Pacific Standard, Nathan Collins, Image searches misrepresent women in the
workplace, Apr 13 2015, http://www.psmag.com/nature-and-technology/
image-searches-misrepresent-women-in-the-workplace

The Cut, Molly Oswaks, This is the first female face Google finds when
you search 'CEO', Apr 13 2015, http://thecut.io/1yoCPE6

The Washington Post, Jennifer Langston, The uncomfortable truth about how we view
working women in one simple Google search, Apr 9 2015, http://wapo.st/1EzDMKP

The Atlantic, Adrienne LaFrance, Be careful what you Google, Apr 10 2015, http://www.
theatlantic.com/technology/archive/2015/04/be-careful-what-you-google/390207/

The Verge, T.C. Sottek, Google search thinks the most important female CEO is Barbie,
Apr 9 2015, http://www.theverge.com/tldr/2015/4/9/8378745/i-see-white-people

PCWorld, Zach Miners, The first woman CEO to appear in a Google images search
is ... CEO Barbie, Apr 9 2015, http://www.pcworld.com/article/2908592/the-first-
woman-ceo-to-appear-in-a-google-images-search-is-ceo-barbie.html

GeekWire, Molly Brown, Study puts Google image search results to the
gender bias test, Apr 9 2015, http://www.geekwire.com/2015/study-
puts-google-image-search-results-to-the-gender-bias-test/

2012   **For "Lullaby: A capture & access system ..." [C04]**
97.3 KIRO FM News, The Lullaby could help you get a better night's sleep some
day, Sept 11 2012, http://mynorthwest.com/?nid=577&a=9946148&p=1011

Mashable, Device uncovers the secret things you do in your sleep,
Sept 10 2012, http://mashable.com/2012/09/10/lullaby-sleep-lab/

17

NBCNews.com, Francie Diep, Lullaby puts a sleep lab in your bedroom, Sept 7 2012, http://www.nbcnews.com/id/48947316/ns/technology_and_science-innovation/t/lullaby-puts-sleep-lab-your-bedroom

Teaching experience

───── at Northwestern University

WINTER 2022 | **MTS 525 / COMP SCI 496: Visualization for Scientific Communication**
Students: ~15

WINTER 2022 | **COMP SCI 333: Interactive Information Visualization**
Students: ~40

FALL 2021 | **COMM ST 395: Information Visualization**
Students: ~10

SPRING 2021 | **COMM ST 395: Information Visualization**
Students: ~10

WINTER 2021 | **MTS 525 / COMP SCI 496: Visualization for Scientific Communication**
Students: ~10

WINTER 2021 | **HLTH COM 455: Human–Computer Interaction for Healthcare**
Students: ~45

───── at the University of Michigan

WINTER 2020 | **SI 649 / EECS 548: Information Visualization**
Students: ~50

WINTER 2019 | **SI 649 / EECS 548: Information Visualization**
Students: ~50

FALL 2018 | **SI 330: Data Manipulation**
Students: ~50

WINTER 2018 | **SI 710: Practical Use and Communication of Bayesian Statistics**
Students: ~15

WINTER 2018 | **SI 649 / EECS 548: Information Visualization**
Students: ~60

FALL 2017 | **SI 649 / EECS 548: Information Visualization**
Students: ~60

WINTER 2017 | **SI 330: Data Manipulation**
Students: ~50

FALL 2016 | **SI 649 / EECS 548: Information Visualization**
Co-taught with Eytan Adar. Students: ~60

—— Curriculum development at University of Washington CSE

2014 **CSE 440: Introduction to HCI**
Assisted James Fogarty in redesigning the fourth year Human–Computer
Interaction curriculum for the Fall 2014 and Winter 2015 offerings

—— as a Teaching Assistant at University of Washington CSE

WINTER 2015 **CSE 440: Introduction to HCI**
Professor: Maya Cakmak. Students: 50
Led weekly group critiques, marked assignments

WINTER 2011 **CSE 510: Human–Computer Interaction**
Professor: James Fogarty. Students: 16
Marked labs and reading reports

FALL 2010 **CSE 321: Software Design and Implementation**
Professor: David Notkin. Students: 42
Tutored students one-on-one, marked, ran labs/recitations

—— as a Teaching Assistant at University of Waterloo CS

WINTER 2010 **CS 349: User Interfaces**
Professor: Michael Terry. Students: 128
Tutored students one-on-one, marked, covered some lectures

FALL 2009 **CS 489: Human–Computer Interaction**
Professor: Michael Terry. Students: 31
Provided feedback at group critiques, marked, covered some lectures

SPRING 2009 **CS 349: User Interfaces**
Professor: Byron Becker. Students: 50
Tutored students one-on-one, marked

WINTER 2009 **CS 489: Human–Computer Interaction**
Professor: Edward Lank. Students: 13
Provided feedback at group critiques, marked, covered some lectures

FALL 2008 **CS 489: Human–Computer Interaction**
Professor: Michael Terry. Students: 23
Provided feedback at group critiques, marked, covered some lectures

Research assistantships & internships

2014–2016 **Research Assistant, Intel Science & Technology Center for Pervasive Computing at UW**
Supervisor: Julie Kientz
Exploring pervasive technology for health and behaviour change

FALL 2013 **Research Intern, Microsoft Research Cambridge**
Supervisors: Kenton O'Hara, James Scott
Designed and prototyped novel hardware for smartphone interaction

SUMMER 2012   **Research Intern, Microsoft Research Redmond**
Supervisors: Dan Morris, m.c. schraefel
Studied of user perceptions of consumer health sensing data with a focus on weight

WINTER 2011   **Research Assistant, Intel Labs Seattle**
Supervisors: Ben Greenstein, Sunny Consolvo
Built and evaluated Lullaby, a system for tracking environmental factors that disturb sleep

2008–2010   **Graduate Research Assistant, University of Waterloo**
Supervisor: Michael Terry
Designed and evaluated user interfaces for software agreements

2007–2008   **Undergraduate Research Assistant, University of Waterloo**
Supervisor: Michael Terry
Developed and user-tested narrative pictograms for informed consent