

## Research interests

**Broadly**—Designing / building / evaluating user interfaces and user interaction, with a particular interest in communicating complex data and concepts to end-users. **Latently**—How the communication of uncertainty (or lack of it) affects how people use and trust everyday systems.

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

## Education

- 2010–(2016) **PhD, Computer Science & Engineering, University of Washington (ABD)**  
Advisors: Julie Kientz and Shwetak Patel
- 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

- 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)**
- 2013 **Google Travel Award for CHI ‘13**
- 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

In human–computer interaction, top-tier conferences (< 30% acceptance rate) are as—or more—impactful than journals; see <http://dx.doi.org/10.1145/1743546.1743569>.

—— Journal articles (fully reviewed, archival)

- 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, Nathaniel F Watson  
JCSM: Journal of clinical sleep medicine 11(12), 1455–1461

—— Conference papers (fully reviewed, archival)

- C12 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 (to appear), **Best paper honorable mention (top 5%)**
- C11 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 (to appear)
- C10 2015 **Beyond Weber's Law: A second look at ranking visualizations of correlation**  
*Matthew Kay* and Jeffrey Heer  
INFOVIS '15: IEEE Information Visualization, **Best paper honorable mention (top 2 papers)**
- 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%)**

- CO3 2010 **Textured agreements: Re-envisioning electronic consent**  
*Matthew Kay* and Michael Terry  
 SOUPS '10: Symposium on usable privacy and security, 25% AR
- CO2 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
- CO1 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
- BO1 2016 **Nonparametric statistics in human-computer interaction**  
 Jacob O. Wobbrock, *Matthew Kay*  
 in *Modern Statistical Methods for HCI*, eds. Judy Robertson and Maurits Kaptein  
 Springer (in print 2016)
- Magazine articles
- MO1 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)
- AO5 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
- AO4 2012 **Evaluating Zeo and Fitbit for tracking sleep behaviors**  
*Matthew Kay*, Eun Kyoung Choe, and Julie A. Kientz  
 UBICOMP '12 workshop on evaluating off-the-shelf technologies for personal health monitoring
- AO3 2012 **Lullaby: Capturing the unconscious in the sleep environment**  
*Matthew Kay*, Eun Kyoung Choe, Jesse Shepherd, Benjamin Greenstein,  
 Nathaniel F. Watson, Sunny Consolvo, and Julie A. Kientz  
 CHI '12 workshop on personal informatics
- AO2 2011 **Lullaby: Environmental sensing for sleep self-improvement**  
*Matthew Kay*, Eun Kyoung Choe, Jesse Shepherd, Benjamin Greenstein,  
 Sunny Consolvo, Patrick Gage Kelley, and Julie A. Kientz  
 CHI '11 workshop on personal informatics
- AO1 2010 **Communicating software agreement content using narrative pictograms**  
*Matthew Kay* and Michael Terry  
 ALT.CHI '10 (CHI '10 extended abstracts)
- Other articles
- OO2 2013 **Ubicomp 2012 conference report**  
 Sidhant Gupta and *Matthew Kay*  
 IEEE Pervasive Computing 12(1)

- OO1    2012    **The changing nature of (ubiquitous) computing**  
*Matthew Kay*  
 XRDS blogs, in Crossroads, the ACM Magazine for Students 19(1)
- Posters
- PO2    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
- PO1    2009    **Textured agreements: Re-envisioning electronic consent**  
*Matthew Kay* and Michael Terry  
 SOUPS '09: Symposium on usable privacy and security
- Theses
- TO1    2010    **Techniques and heuristics for improving the visual design of software agreements**  
*Matthew Kay*  
 Master's thesis, University of Waterloo

## Publicly available research code and 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).

- 2015    **Data and analysis for "Beyond Weber's Law ..."** [C10]  
*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>
- 2014    **ARTool: R package for aligned rank transform for nonparametric factorial ANOVAs**  
*Matthew Kay* and Jacob O. Wobbrock  
<https://github.com/mjskay/ARTool>  
 Installations: [>3000](#)

## Invited 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.

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

- Talks & lectures
- 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
- Class guest lectures
- 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

## Research experience & internships

- 2014–2015 **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

## Press

- 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-sleeplab/>  
  
*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](http://www.nbcnews.com/id/48947316/ns/technology_and-science-innovation/t/lullaby-puts-sleep-lab-your-bedroom)

## Service

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- To the research community
- 2015–2016 **CSCW 2016 Co-webmaster**  
Responsible for website design & maintenance for CSCW 2016 conference
- 2014 **UbiComp 2014 Program Committee Student Volunteer**  
Assisted program committee chairs in running the program committee meeting.
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- As a workshop or special interest group (SIG) organizer
- 2016 **Special Interest Group on Transparent Statistics in HCI**  
*Matthew Kay*, Steve Haroz, Shion Guha, and Pierre Dragicevic  
SIG at CHI '16 (upcoming)
- 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
- 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
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- 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
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- At University of Waterloo CS
- SPRING 2010 **Human–Computer Interaction Tutorial Leader**  
Designed and ran two introductory HCI tutorials for high school girls interested in CS

—— As a reviewer

⚙ **Special Recognitions** for exceptional reviews at UIST 2015, CSCW 2016, CHI 2016

2016 CSCW ⚙

2013–2016 CHI ⚙ (2016)

2013–2016 CHI Works-in-Progress / Late-Breaking Work

2014–2015 UbiComp

2015 UIST ⚙

2015 IEEE Pervasive Computing

2014 Pervasive Health

2010 GI

## Teaching experience

—— Curriculum development

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