Matthew K. Hong

Research Scientist

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Summary

I am a human-computer interaction (HCI) research scientist with over 9 years of user research experience. I apply generative, iterative, and evaluative research methods to bring a human-centric perspective to the design and development of AI-based technologies, and have a demonstrated interest in the domain areas of human-AI interaction, health informatics, and applied natural language processing.

Education

2020	**PhD, Human-Centered Computing**, Georgia Institute of Technology.
Dissertation Thesis	Designing Collaborative Mobile Health Experiences for Adolescent Patients (Advisor: Lauren Wilcox, Co-advisor: Rosa Arriaga)
2014	**MHCI, Human-Computer Interaction**, Carnegie Mellon University.
2012	**BSc, Cognitive Science**, University of California, San Diego.
Honors Thesis	Multimodal Cues For Desktop Workspace Interaction (Advisor: James D. Hollan)

Certification

2021	**Natural Language Processing Specialization**, *DeepLearning.AI*, Coursera (Credential).
2021	**Designing, Running, and Analyzing Experiments**, *University of California San Diego*, Coursera (Credential).

Experience

Nov 2021 - Present	**Research Scientist**, *Toyota Research Institute*, Machine assisted Cognition, Los Altos, CA.

Sep 2020 - Nov 2021   **NLM Postdoctoral Research Fellow**, *Department of Biomedical Informatics and Medical Education*, University of Washington, Seattle, WA.
- Led a team of 9 researchers at UW and UCSD to develop an AI-based health tool that can mitigate hidden healthcare biases in the clinic (link).
- Investigated opportunities to prevent home medication administration errors through large scale analysis of online health forum posts using a mix of topic modeling and qualitative content analysis.

Apr - Jul 2020   **Research Intern (PhD)**, *Human-AI eXperiences (HAX) Group*, Microsoft Research AI, Redmond, WA.
- Investigated challenges that UX practitioners face in prototyping and testing AI products.
- Developed an AI failures taxonomy based on a systematic characterization of 16 AI failure scenarios in common natural language based products.
- Designed and evaluated AI Playbook (rebranded as HAX Playbook), an interactive tool for generating interaction scenarios to test when designing user-facing AI systems.
- HAX Playbook (link) is released as an open source software and is fully extensible
- Research has been covered by WIRED (link) and Microsoft AI Blog for Business & Tech (link)

2014 - 2020   **Graduate Research Assistant**, *School of Interactive Computing*, Georgia Institute of Technology, Atlanta, GA.
- Designed, deployed, and evaluated two fully functional mobile health systems (CO-OP and Rapport) to support chronically ill patients' collaborative health management.
- Applied quantitative and qualitative user research methods in various clinical and non-clinical settings.
- Managed IRB documentation work across two university hospitals and Georgia Tech.
- Published nine peer-reviewed papers in leading computing conferences and medical journals.

Jan - Aug 2014   **Research Lead**, *Boeing Sponsored Project*, Carnegie Mellon University, Pittsburgh, PA.
- Conducted research and designed new approaches to streamline communication on the 737 line at the Boeing Renton factory to improve efficiency and safety.
- Devised and implemented qualitative research methods such as concept elicitation through speed dating, diary study, focus groups, and experience prototyping studies with factory employees.
- Led negotiations with Boeing IT management to gain access to factory floor.
- Submitted high-fidelity prototype, concept video, website, and two internal technical reports as final deliverables.

Apr 2013 - Aug 2013   **UX Researcher (Contract)**, *Tab32*, Integrated Charts Inc., La Jolla, CA.
- Created mid-high fidelity prototypes for a dental patient record management application

Oct 2012 - Mar 2013   **UX Researcher (Contract)**, *Cinder Cooking Grill*, Palate Home Inc., La Jolla, CA.
- Conducted market research with middle class home makers to understand their challenges planning for and cooking daily meals.
- Conducted usability testing of a prototype sous-vide cooking machine with home makers to capture reactions and generate insights for design.
- Submitted low-mid fidelity prototypes for a smart cooking device with precision temperature control functionality, and research report summarizing design insights from market research and usability testing.

Jun - Oct 2012	**Research Assistant**, *Department of Biomedical Informatics*, UCSD School of Medicine, La Jolla, CA.

- ○ Conducted usability studies, and designed and evaluated a prototype user interface for Schema Builder–a web-based user interface that allows clinicians to define custom NLP schemas in order to extract important information from unstructured patient records.
- ○ Systematically investigated clinicians' workflow patterns via cognitive walkthroughs, which helped me structure concept elicitation tasks and contextual inquiries.
- ○ Defined use case scenarios for adverse drug events and pathology reports of colonoscopy exams.

Publications

*Conference proceedings are considered top-tier venues in Human-Computer Interaction (HCI) and Computer Science disciplines, and generally exceed HCI journals in their selectivity, visibility, and impact. See h5-index for impact of HCI conference venues. See Google Scholar profile for full list of publications.

Refereed Journal Publications

[j2] Jessica S Ancker, Marianne Sharko, **Matthew K. Hong**, Hannah Mitchell, and Lauren Wilcox. Should Parents See Their Teen's Medical Record? Asking About The Effect on Adolescent–Doctor Communication Changes Attitudes. *Journal of American Informatics Association (JAMIA 2018)*.

[j1] Marianne Sharko, Lauren Wilcox, **Matthew K. Hong**, and Jessica S Ancker. Variability in Adolescent Portal Privacy Features: How the Unique Privacy Needs of the Adolescent Patient Create a Complex Decision-Making Process. *Journal of American Informatics Association (JAMIA 2018)*. (editor's choice)

Refereed Conference Proceedings

[c9] **Matthew K. Hong**, Adam Fourney, Derek DeBellis, and Saleema Amershi. Planning for Natural Language Failures with the AI Playbook. *Proceedings of the 39th Annual ACM Conference on Human Factors in Computing Systems (CHI 2021)*, Yokohama, Japan, 2021 (26.3% acceptance rate).

[c8] **Matthew K. Hong**, Udaya Lakshmi, Kimberly Do, Prahalad Sampath, Thomas A. Olson, and Lauren Wilcox. Using Diaries to Probe the Illness Experiences of Adolescent Patients and Parental Caregivers. *Proceedings of the 38th Annual ACM Conference on Human Factors in Computing Systems (CHI 2020)*, Honolulu, HI, USA, 2020 (24.3% acceptance rate).

[c7] Lauren Wilcox, Marianne Sharko, **Matthew K. Hong**, Julie Hollberg, and Jessica S Ancker. The Need for Guidance and Consistency in Adolescent Privacy Policies: A Survey of CMIOs. *Proceedings of the 2018 AMIA Annual Symposium (AMIA 2018)*, San Fransisco, CA, USA, 2018.

[c6] Udaya Lakshmi, **Matthew K. Hong**, and Lauren Wilcox. Integrating Patient-Generated Observations of Daily Living into Pediatric Cancer Care: A Formative User Interface Design Study. *Proceedings of the Sixth IEEE International Conference on Healthcare Informatics (ICHI 2018)*, New York City, NY, USA, 2018.

[c5] **Matthew K. Hong**, Udaya Lakshmi, Thomas A. Olson, and Lauren Wilcox. Visual ODLs: Co-Designing Patient-Generated Observations of Daily Living to Support Data-Driven Conversations in Pediatric Care. *Proceedings of the 36th Annual ACM Conference on Human Factors in Computing Systems (CHI 2018)*, Montreal, Canada, 2018. (25.7% acceptance rate)

[c4] Matthew K. Hong, Clayton Feustel, Meeshu Agnihotri, Max Silverman, Stephen F. Simoneaux, and Lauren Wilcox. Supporting Families in Reviewing and Communicating about Radiology Imaging Studies. *Proceedings of the 35th Annual ACM Conference on Human Factors in Computing Systems (CHI 2017)*, Denver, CO, USA, 2017. (25% acceptance rate)

[c3] Matthew K. Hong, Lauren Wilcox, Clayton Feustel, Karen Wasilewski-Masker, Thomas A. Olson, and Stephen F. Simoneaux. Adolescent and Caregiver use of a Tethered Personal Health Record System. *Proceedings of the 2016 AMIA Annual Symposium (AMIA 2016)*, Chicago, IL, USA, 2016.

[c2] Matthew K. Hong, Lauren Wilcox, Daniel Machado, Thomas A. Olson, and Stephen F. Simoneaux. Care Partnerships: Toward Technology to Support Teens' Participation in Their Health Care. *Proceedings of the 34th Annual ACM Conference on Human Factors in Computing Systems (CHI 2016)*, San Jose, CA, USA, 2016. (23.4% acceptance rate)

[c1] Matthew K. Hong, Anne Marie Piper, Nadir Weibel, Simon Olberding, and James D. Hollan. Microanalysis of Active Reading Behavior to Inform Design of Interactive Desktop Workspaces. *Proceedings of the 2012 ACM International Conference on Interactive Tabletops and Surfaces (ITS 2012)*, Boston, MA, USA, 2012. (29% acceptance rate)

Refereed Workshop Proceedings

[w7] Marianne Sharko, Hannah Galvin, Susan J. Kressly, Joseph H Schneider, Fabienne Bourgeois Feliciano (Pele) Yu, **Matthew K. Hong**, Lauren Wilcox, Jessica S Ancker. National Working Group to Standardize the Identification of Sensitive Data Elements to Support Patient Privacy. *Proceedings of the 2019 AMIA Annual Symposium (AMIA 2019)*, Washington, DC, USA, 2019.

[w6] Jessica S Ancker, Marianne Sharko, **Matthew K. Hong**, Hannah Mitchell, and Lauren Wilcox. Should parents see teen medical records? Attitudes change when people are prompted to think about risky adolescent behaviors. *Proceedings of the 2018 AMIA Annual Symposium (AMIA 2018)*, San Fransisco, CA, USA, 2018.

[w5] Matthew K. Hong, Udaya Lakshmi, and Lauren Wilcox. Just-in-Time Design: In Situ Methods for Capturing and Articulating Adolescents' Illness Experiences. *Workshop on Interactive Systems in Health Care (WISH 2017)*, Washington, DC, USA, 2017.

[w4] Marianne Sharko, Lauren Wilcox, **Matthew K. Hong**, and Jessica S Ancker. The Variation in Patient Portal Access for Adolescents in the United States: How Different Medical Centers Manage their Adolescent Access. *Proceedings of the 2017 AMIA Annual Symposium (AMIA 2017)*, Washington, DC, USA, 2017.

[w3] Eunji Chong, Jaehoon Lee, **Matthew K. Hong**, and James Rehg. Scalable Image-based Search-and-Discovery. *Proceedings of the 35th Annual ACM Conference on Human Factors in Computing Systems (CHI 2017)*, Denver, CO, USA, 2017.

[w2] Matthew K. Hong and Lauren Wilcox. Care Partnerships: Toward Technology to Support Teens' Participation in Their Health Care (Research Highlight). *Workshop on Interactive Systems in Health Care (WISH 2016)*, San Jose, CA, USA, 2016.

[w1] Yang Liu, Melissa Tharp, **Matthew K. Hong**, Harry Hochheiser, and Wendy W. Chapman. Schema Builder: A Web-based User Interface for Authoring and Sharing Natural-Language Processing Schemas. *Proceedings of the 2013 AMIA Annual Symposium (AMIA 2013)*, Washington, DC, USA, 2013.

Doctoral Consortia **[dc1] Matthew K. Hong**. Designing Visual Communication of Everyday Illness Experiences in Complex Pediatric Care. *Proceedings of the 37th Annual ACM Conference on Human Factors in Computing Systems (CHI 2019)*, Glasgow, UK, 2019. (16% acceptance rate)

Dissertation **[d1] Matthew K. Hong**. Designing Collaborative Mobile Health Experiences for Adolescent Patients. *Georgia Institute of Technology*, Atlanta, GA, USA, 2020.

Industry/Technical **[t2] Matthew K. Hong**, Fonda Chen, Scott Chiu, Emily Danchik, and Chris Wang. Reports Contextualizing Communication at the Boeing Renton Factory. *Spring Research Report 2014 (Boeing-CMU Capstone Project)*, Pittsburgh, PA, USA, 2014.

[t1] Matthew K. Hong, Fonda Chen, Scott Chiu, Emily Danchik, and Chris Wang. Echo: Fostering Connection at the Boeing Renton Factory. *Summer Design Report 2014 (Boeing-CMU Capstone Project)*, Pittsburgh, PA, USA, 2014.

Teaching

Winter 2021 **Co-Instructor**, *University of Washington*, School of Medicine.
Participatory Design in the Age of Digital Health (Co-led with Andrew Berry).

Spring 2018 **Graduate Teaching Assistant**, *Georgia Institute of Technology*, College of Computing.
User Interface Design (Lauren Wilcox).

Fall 2017 **Guest Lecturer**, *Georgia Institute of Technology*, College of Computing.
Personal Health Informatics. "Designing Health Information Technologies to Engage Families in Data-Driven Medical Communication"(Lauren Wilcox).

Spring 2017 **Graduate Teaching Assistant**, *Georgia Institute of Technology*, College of Computing.
Issues in Human-Centered Computing (Betsy DiSalvo).

Spring 2016 **Graduate Teaching Assistant**, *Georgia Institute of Technology*, College of Computing.
User Interface Design (Lauren Wilcox).

Summer S1 2014 **Graduate Teaching Assistant**, *Carnegie Mellon University*, School of Computer Science.
Human-Computer Interaction for Technology Executives (Brad Myers).

Spring 2014 **Graduate Teaching Assistant**, *Carnegie Mellon University*, School of Computer Science.
Entrepreneurship and Innovation in Technology (Edward Engler).

Winter 2012 **Undergraduate Teaching Assistant**, *UC San Diego*, Department of Cognitive Science.
Cognitive Design Studio (James D. Hollan).

Invited Talks

Spring 2020 **GVU Brown Bag Seminar**, *Georgia Tech*.
"Personalizing Health Management Through Human-Centered Data Augmentation"

Summer 2018 **NSF REU Civic Data Science Seminar**, *Georgia Tech*.
"Using Data-Driven Approaches to Design Interactive Patient-Centered Technologies"

Press

Jul 19, 2021 "New toolkit aims to help teams create responsible human-AI experiences", by Leah Culler, Microsoft AI Blog for Business & Tech (link)

Jun 17, 2021 "The Efforts to Make Text-Based AI Less Racist and Terrible", by Khari Johnson, WIRED (link)

Mentoring

2020-2021 **Hyeyoung Ryu**, PhD iSchool (C), University of Washington.
Fall 2019 **Gurudutt Perichetla**, M.S. HCI (C), Georgia Tech.
Fall 2019 **Aarti Thapar**, B.S. CS (C), Georgia Tech.
2019 **Kimberly Do**, B.S. CS (C), Georgia Tech.
Fall 2018 **Xuejin Tan**, M.S. HCI (C), Georgia Tech.
Spring 2018 **Alan Lu**, B.S. CS (C), Georgia Tech.
2017-2018 **Chaitanya Bapat**, M.S. CS, Georgia Tech. Now SDE @ Amazon
Spring 2017 **Udaya Lakshmi**, M.S. HCI, Georgia Tech. Now HCC PhD @ GT
2016-2017 **Meeshu Agnihotri**, M.S. HCI, Georgia Tech. Now Informatics PhD @ UCI
2016-2017 **Max Silverman**, M.S. HCI, Georgia Tech. Now UX Researcher @ Yahoo
Fall 2016 **Alex Ryan**, M.S. HCI, Georgia Tech. Now UX Designer @ Roadie
2015-2016 **Clayton Feustel**, M.S. CS, Georgia Tech. Now CS PhD @ GT
2014-2015 **Daniel Machado**, M.S. HCI, Georgia Tech. Now UX Researcher @ Twitter
Fall 2014 **Meghna Mehta**, M.S. HCI, Georgia Tech. Now UX Designer @ Striim

Service

Associate Chair **CHI**: 2022

Peer-review **CHI**: 2014-
CSCW: 2015-
Pervasive Health: 2015-
IMWUT: 2019-

Volunteering **Conference Student Volunteer**. Pervasive Health 2012, CHI 2015
Workshop Organizer: Workshop on Interactive Systems in Healthcare (WISH 2017)

Working Group	**Member**. American Academy of Pediatrics Council on Clinical Information Technology
Georgia Tech	**President**. College of Computing, Korean Student Association (KSA)
UCSD	**Founding Member**. User Experience San Diego (UXSD)
	Officer. Korean-American Scientists and Engineers Association (KSEA)

Awards

2019	**GVU Foley Scholars**. Georgia Institute of Technology ($5000).
	For student excellence in research contributions to computing (top 3 PhD students awarded in the program each year).
2019	**Doctoral Consortium Travel Award**. CHI 2019 (ACM SIGCHI).
	For presenting and developing research interests in an interdisciplinary workshop (16% acceptance rate)
2019	**George Family Foundation Fellowship**. Georgia Institute of Technology ($3500).
	For commitment to healthcare and demonstration of leadership
2018	**Editor's Choice**. Journal of American Informatics Association
2012	**Department Honors with Distinction**. University of California, San Diego
2010 - 2012	**Provost Honors List**. University of California, San Diego

Skills

User Research	Human-AI Interaction, Participatory Design, Contextual Inquiry, Design Probe, Speed Dating, Ecological Momentary Assessment, Ethnography, Focus Groups, Heuristic Evaluation, Interview, Survey, Usability Testing, Card Sorting, Think-aloud Protocol
Data Analysis	Experimental Design, A/B Testing, Statistical Programming, Statistical Analysis, Qualitative Analysis, Competitive Analysis, Usage Log Analysis
Natural Language Processing	Machine Translation, Word Embeddings, Sentiment Analysis, Vector Space Models, Locality-Sensitive Hashing, POS Tagging, Word2vec, N-gram Language Models, Autocorrect
Tools	Sketch, Adobe Creative Suite, Figma, HTML, CSS, JavaScript, Python, Node.js, R Studio, Qualitrics, REDCap

References

Advisor	**Lauren G. Wilcox**, Associate Professor
	School of Interactive Computing
	Georgia Institute of Technology
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Co-advisor   **Rosa Arriaga**, Associate Professor
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Dissertation   **Beth Mynatt**, Professor
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Andrea Grimes Parker, Associate Professor
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Mentors   **Adam Fourney**, Principal Researcher
Microsoft Research AI
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Saleema Amershi, Senior Principal Research Manager
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