

Matthew K. Hong

Research Scientist

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Summary

I am a human-computer interaction (HCI) research scientist with over 10 years of user research experience. I apply user research methods to bring a human-centric lens to the design and development of AI-based technologies. My research in human-centered AI is focused on democratizing domain specific knowledge to improve people's daily practice and quality of living.

Education

- 2020 **PhD, Human-Centered Computing**, Georgia Institute of Technology.
Dissertation Thesis Designing Collaborative Mobile Health Experiences for Adolescent Patients
- 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

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*, Future Product Innovation, Los Altos, CA.
- I lead a team of designers, behavioral scientists, HCI and ML researchers in the Future Product Innovations group to augment human creativity using generative AI models.
 - Led evaluation of an ML-assisted user interface for unstructured text analysis, leading to actionable recommendations for ML/HCI practices, 1 filed patent, and 2 research articles.

- 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 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 **[j4]** Xiang 'Anthony' Chen, Jeff Burke, Ruofei Du, **Matthew K. Hong**, Jennifer Jacobs, Philippe Laban, Dingzeyu Li, Nanyun Peng, Karl D. D. Willis, Chien-Sheng Wu, Bolei Zhou. Next Steps for Human-Centered Generative AI: A Technical Perspective. *arXiv preprint arXiv:2306.15774*. (In Submission).

[j3] Matthew Klenk, **Matthew K. Hong**, Shabnam Hakimi, and Charlene Wu. Anticipatory thinking in design. *AI Magazine (AI Magazine 2023)*.

[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 **[c12]** Youngseung Jeon, **Matthew K. Hong**, Yan-Ying Chen, Kalani Murakami, Jonathan Q. Li, Xiang 'Anthony' Chen, and Matthew Klenk. Weaving ML with Human Aesthetic Assessments to Augment Design Space Exploration: An Automotive Wheel Design Case Study. *Proceedings of the 42nd Annual ACM Conference on Human Factors in Computing Systems (CHI 2024)*, Honolulu, HI, USA, 2024 (24% acceptance rate)(To Appear).

[c11] Alice Cai, Steven R Rick, Jennifer L Heyman, Yanxia Zhang, Alexandre Filipowicz, **Matthew K. Hong**, Matthew Klenk, and Thomas Malone. DesignAID: Using Generative AI and Semantic Diversity for Design Inspiration. *Proceedings of The ACM Collective Intelligence Conference (CI'23)*, Delft, Netherlands, 2023.

[c10] Francine Chen, **Matthew K. Hong**, Laurent Denoue, Kate S Glazko, Emily Sarah Sumner, Yan-Ying Chen and Matt Klenk. CodeML: A Machine Learning-Assisted User Interface for Code Identification and Labeling. *Proceedings of the 41st Annual ACM Conference on Human Factors in Computing Systems (CHI 2023)*, Hamburg, Germany, 2023.

[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 Francisco, 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

[w11] Youngseung Jeon, **Matthew K. Hong**, Yan-Ying Chen, Kalani Murakami, Jonathan Q. Li, Xiang 'Anthony' Chen, and Matthew Klenk. Weaving ML with Human Aesthetic Assessments to Augment Design Space Exploration. *Machine Learning for Creativity and Design Workshop at NeurIPS 2023*, New Orleans, LA, USA, 2023.

[w10] Hyeonsu B. Kang, David Chuan-en Lin, Martelaro Nikolas, Aniket Kittur, Yan-Ying Chen, and **Matthew K. Hong**. BIOSPARK: An End-to-end Generative System for Biological-Analogical Inspirations and Ideation. *Machine Learning for Creativity and Design Workshop at NeurIPS 2023*, New Orleans, LA, USA, 2023.

[w9] **Matthew K. Hong**, Shabnam Hakimi, Yan-Ying Chen, Heishiro Toyoda, Charlene Wu, Matthew Klenk. Generative AI for Product Design: Getting the Right Design and the Design Right. *Generative AI and HCI workshop at CHI 2023 (CHI 2023)*, Virtual, 2023.

[w8] **Matthew K. Hong**, Francine Chen, Yan-Ying Chen, and Matthew Klenk. Supporting Qualitative Coding with Machine-in-the-loop. *Human-Centered AI Workshop at NeurIPS 2022 (NeurIPS 2022)*, Virtual, 2022.

[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 Francisco, 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 Reports **[t2] Matthew K. Hong**, Fonda Chen, Scott Chiu, Emily Danchik, and Chris Wang. 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, Qualtrics, REDCap

References

Managers **Matthew Klenk**, Director
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Dissertation
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