407 S. Craig Street, Room 212
Pittsburgh, PA, USA, 15213
✉ mingzhe2@andrew.cmu.edu
Personal Website: franklin-li.com
Google Scholar Link
Citizenship: Canada

# Franklin Mingzhe Li

## Research Interests

Human-Computer Interaction (HCI), Accessibility and Aging, Ubiquitous Computing, Human-AI Interaction, Robotics and Physical AI, Health and Well-being, Quantitative and Qualitative Study, Participatory Design, Human-Centered Data Science.

My research bridges Human–Computer Interaction, Accessibility, and Ubiquitous Computing to close the "cyber-physical gap" between AI and real-world activity. I study how people use assistive technologies and build contextual AI systems like OSCAR and AROMA that integrate vision, modeling, and interaction to support physical tasks. My work advances human-centered AI that is adaptive, trustworthy, and enhances everyday independence.

## Education

Sept. 2020 - May 2026 **Ph.D. in Human-Computer Interaction (Advised by Patrick A. Carrington)**,
*Carnegie Mellon University*, *School of Computer Science (GPA 4.0/4.0)*
*Thesis Committee: Patrick Carrington, John Zimmerman, Shaun Kane, Chris Harrison, Gregory Abowd*.

Sept. 2020 - Dec. 2022 **M.S. in Computer Science (Advised by Patrick A. Carrington)**,
*Carnegie Mellon University*, *School of Computer Science, (GPA 3.99/4.0)*.

Sept. 2018 - May 2020 **M.S. in Computer Science (Advised by Khai N. Truong)**,
*University of Toronto, Department of Computer Science*, *(GPA 4.0/4.0)*.

Aug. 2013 - May 2018 **B.ASc. in Electrical Engineering (Advised by Khai N. Truong)**,
*University of Toronto, Department of Electrical and Computer Engineering*.

## Grants and Fellowship

Contributed over $1.5M in competitive funding and fellowships from academic, industry, and government sources.

Aug. 2025 **Academic Research Fund (AcRF) Tier 2**, Singapore Ministry of Education ($960,000), Role: Collaborator; PI: Bin Zhu.

Feb. 2025 **Stuart K Card Fellowship**, Carnegie Mellon University ($120,000), Role: PI.

Aug. 2022 **Google's Research Collabs**, Google Inc. ($80,000 Plus $20,000 in Google Cloud), Role: Co-PI; PI: Patrick Carrington.

Apr. 2021 **Postgraduate Fellowship-Doctoral**, The Natural Sciences and Engineering Research Council of Canada (NSERC) ($63,000), Role: PI.

Jan. 2021 **Inclusive Design Challenge Award**, US Department of Transportation ($300,000), Role: Collaborator; PI: Nik Martelaro; Co-PIs: Patrick Carrington, Sarah Fox, Jodi Forlizzi.

Sept. 2018 **Faculty of Arts And Science Tuition Fellowship**, University of Toronto ($18,558), Role: PI.

Nov. 2018 **Faculty of Arts And Science Program-Level Fellowship**, University of Toronto ($1,000), Role: PI.

## Awards and Scholarship

Oct. 2022 **Graduate Student Assembly/Provost Conference Funds**, Carnegie Mellon University ($750).

Mar. 2022 **Graduate Student Assembly/Provost Conference Funds**, Carnegie Mellon University ($750).

Oct. 2020 **Best Artifact Award**, ASSETS 2020 ($500).

Aug. 2015 **UTRECS Scholarship**, University of Toronto ($6,000).

## Peer-reviewed Journal Publications

J5 An Exploration of Captioning Practices and Challenges of Individual Content Creators on YouTube for People with Hearing Impairments
**Franklin Mingzhe Li**, Cheng Lu, Zhicong Lu, Patrick Carrington, Khai N. Truong
In Proceedings of ACM on Human-Computer Interaction (PACMHCI), Volume 6, Issue CSCW1, Article 75, 2022.

J4 FMT: A Wearable Camera-Based Object Tracking Memory Aid for Older Adults
**Franklin Mingzhe Li**, Di Laura Chen, Mingming Fan, Khai N. Truong
In Proceedings of ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), 2019.

J3 Exploring the Impact of Emotional Voice Integration in Sign-to-Speech Translators for Deaf-to-Hearing Communication
Hyunchul Lim, Minghan Gao, **Franklin Mingzhe Li**, Nam Anh Dang, Ianip Sit, Michelle M Olson, Cheng Zhang
In Proceedings of ACM on Human-Computer Interaction (PACMHCI), CSCW October, 2025.

J2 Understanding How Older Adults Comprehend COVID-19 Interactive Visualizations via Think-Aloud Protocol
Mingming Fan, Yiwen Wang, Yuni Xie, **Franklin Mingzhe Li**, Chunyang Chen
International Journal of Human-Computer Interaction (IJHCI), 2022.

J1 Face Recognition Assistant for People with Visual Impairments
Mohammad Kianpisheh, **Franklin Mingzhe Li**, Khai N. Truong
In Proceedings of ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), 2019.

## Peer-reviewed Full-Paper Conference Publications

C26 Exploring Object Status Recognition for Recipe Progress Tracking in Non-Visual Cooking
**Franklin Mingzhe Li**, Kaitlyn Ng, Bin Zhu, Patrick Carrington
In Proceedings of the 27th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2025.

C25 More than One Step at a Time: Designing Procedural Feedback for Non-visual Makeup Routines
**Franklin Mingzhe Li**, Akihiko Oharazawa, Chloe Qingyu Zhu, Misty Fan, Daisuke Sato, Chieko Asakawa, Patrick Carrington
In Proceedings of the 27th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2025.

C24 Understanding How Visually Impaired Players Socialize in Mobile Games
Zihe Ran, Xiyu Li, Qing Xiao, Yanyun Wang, **Franklin Mingzhe Li**, Zhicong Lu
In Proceedings of the 27th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2025.

C23 Understanding the Video Content Creation Journey of Creators with Sensory Impairment in Kenya
Lan Xiao, Maryam Bandukda, **Franklin Mingzhe Li**, Mark Colley, Catherine Holloway
In Proceedings of the 27th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2025.

C22 Towards Expressive Visual Content by Blind Creators Through AI Support
Lotus Zhang, Zhuohao (Jerry) Zhang, Gina Clepper, **Franklin Mingzhe Li**, Patrick Carrington, Jacob O. Wobbrock, Leah Findlater
In Proceedings of the 27th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2025.

C21 AROMA: Mixed-Initiative AI Assistance for Non-Visual Cooking by Grounding Multimodal Information Between Reality and Videos
Zheng Ning, Leyang Li, Daniel Killough, JooYoung Seo, Patrick Carrington, Yapeng Tian, Yuhang Zhao, **Franklin Mingzhe Li**, Toby Jia-Jun Li
In Proceedings of the ACM Symposium on User Interface Software and Technology (UIST), 2025.

C20 How Users Who are Blind or Low Vision Play Mobile Games: Perceptions, Challenges, and Strategies
Zihe Ran, Xiyu Li, Qing Xiao, Xianzhe Fan, **Franklin Mingzhe Li**, Yanyun Wang, Zhicong Lu
In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI), 2025.

C19 PANDA: Parkinson's Assistance and Notification Driving Aid
Tianyang Wen, Xucheng Zhang, Zhirong Wan, Jing Zhao, Yicheng Zhu, Ning Su, Xiaolan Peng, Jin Huang, Wei Sun, Feng Tian, **Franklin Mingzhe Li**
In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI), 2025.

C18 SpellRing: Recognizing Continuous Fingerspelling in American Sign Language using a Ring
Hyunchul Lim, Nam Anh Dang, Dylan Lee, Tianhong Catherine Yu, Jane Lu, **Franklin Mingzhe Li**, Yiqi Jin, Yan Ma, Xiaojun Bi, François Guimbretière, Cheng Zhang
In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI), 2025.

C17 A Recipe for Success? Exploring Strategies for Improving Non-Visual Access to Cooking Instructions
**Franklin Mingzhe Li**, Ashley Wang, Patrick Carrington, Shaun K. Kane
In Proceedings of the 26th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2024.

C16 A Contextual Inquiry of People with Vision Impairments in Cooking
**Franklin Mingzhe Li**, Michael Xieyang Liu, Shaun K. Kane, Patrick Carrington
In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI), 2024.

C15 Co-design Accessible Public Robots: Insights from People with Mobility Disability, Robotic Practitioners and Their Collaborations
Howard Ziyu Han, **Franklin Mingzhe Li**, Alesandra Baca Vazquez, Daragh Byrne, Nikolas Martelaro, Sarah E Fox
In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI), 2024.

C14 Designing Gaze-Assisted Upper-Body Gesture Interaction with and for People with Spinal Muscular Atrophy in VR
Jingze Tian, Yingna Wang, Keye Yu, Liyi Xu, Junan Xie, **Franklin Mingzhe Li**, Yafeng Niu, Mingming Fan
In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI), 2024.

C13 Selenite: Scaffolding Online Sensemaking with Comprehensive Overviews Elicited from Large Language Models
Michael Xieyang Liu, Tongshuang Wu, Tianying Chen, **Franklin Mingzhe Li**, Aniket Kittur, Brad A Myers
In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI), 2024.

C12 Embodied Exploration: Facilitating Remote Accessibility Assessment for Wheelchair Users with Virtual Reality
Siyou Pei, Alexander Chen, Chen Chen, **Franklin Mingzhe Li**, Megan Fozzard, Hao-Yun Chi, Nadir Weibel, Patrick Carrington, Yang Zhang
In Proceedings of the 25th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2023.

C11 Understanding Visual Arts Experiences of Blind People
**Franklin Mingzhe Li***, Lotus Zhang*, Maryam Bandukda, Abigale Stangl, Kristen Shinohara, Leah Findlater, Patrick Carrington (*Equal contribution)
In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI), 2023.

C10 Breaking the "Inescapable" Cycle of Pain: Supporting Wheelchair Users' Upper Extremity Health Awareness and Management with Tracking Technologies
Yunzhi Li, **Franklin Mingzhe Li**, Patrick Carrington
In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI), 2023.

C9 Freedom to Choose: Understanding Input Modality Preferences of People with Upper-body Motor Impairments for Activities of Daily Living
**Franklin Mingzhe Li**, Michael Xieyang Liu, Yang Zhang, Patrick Carrington
In Proceedings of the 24th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2022.

C8 "It Feels Like Taking a Gamble": Exploring Perceptions, Practices, and Challenges of Using Makeup and Cosmetics for People with Visual Impairments
**Franklin Mingzhe Li***, Francheska Spektor*, Meng Xia*, Mina Huh*, Peter Cederberg, Yuqi Gong, Kristen Shinohara, and Patrick Carrington (*Equal contribution)
In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI), 2022.

C7 Non-Visual Cooking: Exploring Practices and Challenges of Meal Preparation by People with Visual Impairments
**Franklin Mingzhe Li**, Jamie Dorst, Peter Cederberg, Patrick Carrington
In Proceedings of the 23rd International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2021.

C6 ThumbTrak: Recognizing Micro-finger Poses Using a Ring with Proximity Sensing
Wei Sun, **Franklin Mingzhe Li**, Congshu Huang, Zhenyu Lei, Benjamin Steeper, Songyun Tao, Feng Tian, Cheng Zhang
In Proceedings of the 23rd International Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI), 2021.

C5 "I Choose Assistive Devices That Save My Face" A Study on Perceptions of Accessibility and Assistive Technology Use Conducted in China
**Franklin Mingzhe Li**, Di Laura Chen, Mingming Fan, Khai N. Truong
In Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI), 2021.

C4 TeethTap: Recognizing Discrete Teeth Gestures using Motion and Acoustic Sensing on an Earpiece
Wei Sun*, **Franklin Mingzhe Li***, Benjamin Steeper*, Songlin Xu, Feng Tian, Cheng Zhang (*Equal Contribution)
In Proceedings of the 26th International Conference on Intelligent User Interfaces (IUI), 2021.

C3 Eyelid Gestures on Mobile Devices for People with Motor Impairments
Mingming Fan*, Zhen Li*, **Franklin Mingzhe Li*** (*Equal Contribution)
In Proceedings of the 22nd International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2020, **Best Artifact Award**.

C2 BrailleSketch: A Gesture-based Text Input Method for People with Visual Impairments
**Franklin Mingzhe Li**, Mingming Fan, Khai N. Truong
In Proceedings of the 19th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2017.

C1 The Living Room: Exploring the Haunted and Paranormal to Transform Design and Interaction
Michelle Annett, Matthew Lakier, **Franklin Mingzhe Li**, Daniel Wigdor, Tovi Grossman, George Fitzmaurice
In Proceedings of the 2016 ACM Conference on Designing Interactive Systems (DIS), 2016.

## Peer-reviewed Poster Publications

P4 Accessible Cyber-Physical Activities
Riku Arakawa*, **Franklin Mingzhe Li***, Nandi Zhang, Mina Huh, Amy Pavel, Ryo Suzuki, Patrick Carrington, Yukang Yan (Equal Contribution)
Adjunct Proceedings of the 38th Annual ACM Symposium on User Interface Software and Technology (2025).

P3 OSCAR: Object Status and Contextual Awareness for Recipes to Support Non-Visual Cooking
**Franklin Mingzhe Li**, Kaitlyn Ng, Bin Zhu, Patrick Carrington
Extended Abstracts of the CHI Conference on Human Factors in Computing Systems (CHI), 2025.

P2 Context matters: Investigating information sharing in mixed-visual ability social interactions
Maryam Bandukda, Yichen Wang, Monica Perusquia-Hernandez, **Franklin Mingzhe Li**, Catherine Holloway
Extended Abstracts of the CHI Conference on Human Factors in Computing Systems (CHI), 2024.

P1 The Robot in Our Path: Investigating the Perceptions of People with Motor Disabilities on Navigating Public Space Alongside Sidewalk Robots
Howard Han, **Franklin Mingzhe Li**, Nikolas Martelaro, Daragh Byrne, Sarah E Fox
In Proceedings of the 25th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS), 2023.

## Selected Patent

Aug. 2021 **US Patent:** On-the-fly calibration for improved on-device eye tracking
Jeffrey P. Bigham, **Franklin Mingzhe Li**, Samuel C. White, Xiaoyi Zhang, Qi Shan, Carlos E. Guestrin.

## Professional Experiences

May 2025 - Sept. 2025 **Research Intern at Google**, *Hosted by Cynthia Bennett, and Shaun Kane*, Worked on the research in AI and Accessibility.

May 2019 - Sept. 2019 **Research Intern at Apple**, *Hosted by Jeffrey P. Bigham, and Xiaoyi Zhang*, Worked on the research in AI and Accessibility.

May 2016 - Aug. 2017 **Analog Designer at AMD**, Designed circuit test bench, Cadence layout & schematics, automating test bench, standard cell.

May 2015 - Aug. 2015 **Research Intern at DGP Lab**, *Mentored by Daniel J. Wigdor, and Michelle Annett*, Worked on the research in Human-Computer Interaction, and interaction techniques of multi-touch interfaces.

## Community Services

**Member (2022-2024) and Vice-Chair (2024-Current)**, *SIGCHI Accessibility Committee.*

**Organizing Committee**, *Publication Chair (CHI 2025), Accessibility Chair (ASSETS 2025, CHI 2024, CSCW 2023, HCOMP 2023, C&C 2023, C&C 2022, C&C 2021), Inclusion and Broadening Participation Chair (Ubicomp 2024), Student Volunteer Chair (ASSETS 2022).*

**Program Committee**, *CHI 2026, Ubicomp/ISWC 2025, CHI 2025, ASSETS 2024, CHI 2024, Chinese-CHI 2021, CHI 2020 LBW.*

**Session Chair**, *CHI 2025, CHI 2024*.

**Reviewer**, *CHI 2026, IMWUT 2026, CSCW 2026, UIST 2026, CHI 2025, IMWUT 2025, UIST 2024, IMWUT 2024, MobileHCI 2024, DIS 2024, CHI 2024, ASSETS 2023, CHI 2023, TACCESS 2022, IMWUT 2023, UIST 2023, TACCESS 2022, ISS 2022, CHI 2022, Chinese-CHI 2021, ISS 2021, IDC 2021, UIST 2021, CSCW 2021, CHI 2021, EICS PACM 2021, UIST 2020, IJHCS, CHI 2020, CHI 2020 Late Breaking Works, CHI 2019 Late Breaking Works*.

**Student Volunteer**, *ASSETS 2020*.

Jan. 2025 **PhD Admission Committee**, *Carnegie Mellon University*.

Mar. 2022 **Co-PhD Lead of Open House**, *Carnegie Mellon University*.

Jan. 2022 **REU Admission Committee**, *Carnegie Mellon University*.

Dec. 2018 - May 2019 **Human-Computer Interaction Meeting Organizer**, *University of Toronto*.

## Teaching Experiences

Sept. 2025 **Co-Instructor**,
*Accessibility and Assistive Technology (05332/632), Carnegie Mellon University*.

Mar. 2024 **Guest Lecture**,
*Designing Human-Centered Software, Carnegie Mellon University*,
Invited by Aaron Steinfeld.

Feb. 2024 **Guest Lecture**,
*Designing Human-Centered Software, Carnegie Mellon University*,
Invited by Sherry Tongshuang Wu.

Oct. 2023 **Guest Lecture**,
*Designing Human-Centered Software, Carnegie Mellon University*,
Invited by Aaron Steinfeld and Sherry Tongshuang Wu.

Jan. 2023 - May 2023 **Teaching Assistant**,
*Designing Human-Centered Software, Carnegie Mellon University*.

Aug. 2022 - Dec. 2022 **Teaching Assistant**,
*User-Centered Research and Evaluation, Carnegie Mellon University*.

Jan. 2019 - Apr. 2019 **Teaching Assistant**,
*CSC258H1S: Computer Organization, University of Toronto*.

Sept. 2018 - Dec. 2018 **Teaching Assistant**,
*CSC258H1F: Computer Organization, University of Toronto*.

## Invited Talks

Aug. 2025 **Invited Talk: Conversational Audio Description Editor**,
*Google LLC*,
Invited by Cynthia Bennett and Shaun Kane.

Mar. 2024 **Invited Talk: Building Usable Systems for People with Disabilities in Physical Activities**,
*University of Rochester*,
Invited by Yukang Yan.

Oct. 2023 **Invited Talk: Building Usable Systems for People with Disabilities in Physical Activities**,
*University of Notre Dame*,
Invited by Toby Jia-jun Li.

Mar. 2023 **Invited Talk: Leveraging AI for Accessibility in Physical Space**,
*APEX Lab, The Hong Kong University of Science and Technology (HKUST)*,
Invited by Mingming Fan.

Feb. 2023 **Invited Talk: Leveraging AI for Accessibility in Physical Space**,
*DGP Lab, University of Toronto*.

## Media Coverage

Mar. 2025 **Yahoo News:** Smart ring "spellring" translates sign language into text.

Mar. 2025 **The Magazine of Cornell Ann S. Bowers College of Computing and Information Science:** AI ring tracks spelled words in American Sign Language.

Dec. 2024 **The Magazine of CMU's School of Computer Science:** Accessing Recipe Information Without Looking.

Jun. 2024 **The Magazine of CMU's School of Computer Science:** New Search Engine Tool Helps Users Make Sense of Unfamiliar Topics.

Jul. 2022 **The Magazine of CMU's School of Computer Science:** Accessibility Enables Equality.

Jan. 2022 **Communications of the ACM:** Eyelid gestures for people with motor impairments.

May 2021 **IEEE Spectrum:** The Next Frontier for Gesture Control is Teeth.

Jan. 2021 **Mobility21:** Mobility21 Researchers Win US Department of Transportation Inclusive Design Challenge Award.

Sept. 2019 **New Scientist:** Where have I left my wallet? This smart camera can remind you.

## Mentorship

Feb. 2025 **Chloe Zhu**, *Undergraduate Student at Carnegie Mellon University*, (ASSETS 2025).

Feb. 2025 **Misty Fan**, *Undergraduate Student at Carnegie Mellon University*, (ASSETS 2025).

Jul. 2024 **Zihe Ran**, *Master Student at University of Cambridge*, (CHI 2025, ASSETS 2025).

May 2024 **Areen Khalaila**, *REU Student at Carnegie Mellon University*.

May 2024 **Ashley Fong**, *REU Student at Carnegie Mellon University*.

Jan. 2024 **Kaitlyn Ng**, *Undergraduate Student at Carnegie Mellon University*, (CHI 2025, ASSETS 2025).

May 2023 **Howard Han**, *Master Student at Carnegie Mellon University*, (CHI 2024).

Sept. 2022 **Ashley Wang**, *Master Student at Carnegie Mellon University*, (ASSETS 2024).

May 2022 **Rachel Sadeh**, *REU Student at Carnegie Mellon University*.

Oct. 2021 **Mina Huh**, *Accessibility Research Assistant at KAIST*.

Jun. 2021 **Yuqi Gong**, *Undergraduate Student at Carnegie Mellon University*, (ASSETS 2021).

Mar. 2021 **Jamie Dorst**, *Undergraduate Student at Carnegie Mellon University*, (ASSETS 2021).

Mar. 2021 **Peter Cederberg**, *Master Student at Carnegie Mellon University*, (ASSETS 2021).

## Languages

**English** – Native or bilingual proficiency, **Chinese (Mandarin)** – Native or bilingual proficiency.

## Technical Skills

**Programming Languages:** C/C++, Java, Python, Swift, JavaScript, SQL, HTML, Verilog, Assembly, and others
**UX Skills:** Qualitative Research, Quantitative Research, Experiment Design, Data Analysis, UX Design, Participatory Design.