Xiaoyi Zhang

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Started career as a HCI+AI researcher; delivered product features & internal tools as a ML engineer; guided my team (9 direct reports) as a tech lead. Built ML developer tools heavily used in **Apple Intelligence** and **Vision Pro** effort. Two **Best Paper** awards (CHI, W4A) plus three Best Paper Nominees.

Interests: **ML Developer Tools**, ML Model Optimization, UI Accessibility, HCI.

Employment

2018 - Now	**APPLE	Staff ML Research Engineer & Manager**	Seattle, WA
	Owner (Tech Lead and/or Manager) of all projects below	

2023 - Now	Built **automatic optimization** pipelines that enable Apple Intelligence models **run fast (30 token/s on iPhone) on-device and cloud**. Gate keeper of new model release.
	Made internal **GPTs store for productivity** - engineers made chatbots with work knowledge.
2022 - 2023	Created Talaria to support latency optimization of 60+ ML models, including most of iPhone camera models and all **Vision Pro** real-time models. Won CHI **best paper nominee**.
2020 - 2022	Published ML-driven UI Understanding framework used in **20+ Apple products** (e.g., Siri automation).
2018 - 2020	Defined and shipped Screen Recognition accessibility feature in iOS 14+ (**used by 20M users with visual impairments**). Won CHI **best paper**.

2016 & 2017	**MICROSOFT RESEARCH	Intern**
	Released SwipeSpeak, a communication app for people with ALS (iOS Store / Github).
	Built patented low-cost eye gesture recognition system on phone powered by computer vision.

2013 & 2015	**GOOGLE RESEARCH	Intern**
	Developed collaboration features and presentation mode in coLaboratory (Colab).
	Built patented non-rigid face features detection, pose & gaze tracking, integrated in productivity tools.

2012	**APPLE	Intern**
	Built the first version of Contacts web app for iCloud.

Education

2014 - 2018	**Ph.D.** in Computer Science	University of Washington, Seattle (UW)
Committee	James Fogarty (Advisor), Leah Findlater, Jennifer Mankoff, Meredith Morris, Jacob Wobbrock	
2011 - 2014	**Bachelor** in Computer Science	University of California, Los Angeles (UCLA)

Publication

[2024 CHI] (Best Paper Nominee) **Talaria: Interactively Optimizing Machine Learning Models for Efficient Inference**

F. Hohman, C. Wang, J. Lee, J. Görtler, D. Moritz, J. P. Bigham, Z. Ren, C. Foret, Q. Shan, **X. Zhang** • PAPER

[2024 TOCHI] Towards Automated Accessibility Report Generation for Mobile Apps
A. Swearngin, J. Wu, **X. Zhang***, T. Barik, J. Nichols*

[2022 CHI] Towards Complete Icon Labeling in Mobile Applications
J. Chen, A. Swearngin, J. Wu, T. Barik, J. Nichols, **X. Zhang** • PAPER

[2022 IUI] Understanding Screen Relationships from Screenshots of Smartphone Applications
S. Feiz, J. Wu, **X. Zhang***, S. Swearngin, T. Barik, J. Nichols*

[2022 Arxiv] Extracting Replayable Interactions from Videos of Mobile App Usage
J. Chen, A. Swearngin, J. Wu, T. Barik, J. Nichols, **X. Zhang** • PAPER

[2022 Arxiv] Reflow: Automatically Improving Touch Interactions in Mobile Applications through Pixel-based Refinements
J. Wu, T. Barik, **X. Zhang***, C. Lea, J. Nichols, J. P. Bigham* • PAPER

[2021 CHI] (Best Paper) Screen Recognition: Creating Accessibility Metadata for Mobile Apps from Pixels
X. Zhang*, L. de Greef, A. Swearngin, S. White, K. Murray, L. Yu, Q. Shan, J. Nichols, J. Wu, C. Fleizach, A. Everitt, J. P. Bigham* • VIDEO • PAPER • **Shipped in iOS 14+**

[2021 W4A] (Best Paper) When Can Accessibility Help? Exploration of Accessibility Feature Recommendation on Mobile Devices
J. Wu, G. Reyes, S. White, **X. Zhang***, J. P. Bigham* • PAPER

[2021 UIST] Screen Parsing: Towards Reverse Engineering of UI Models from Screenshots
J. Wu, **X. Zhang***, J. P. Bigham, J. Nichols*

[2020 TACCESS] An Epidemiology-Inspired Large-scale Analysis of Android App Accessibility
A. Ross, **X. Zhang***, J. Fogarty, J. O. Wobbrock*

[2019 Web Accessibility] Book Chapter: Tangible Interfaces
M. Baldwin, R. Khurana, D. McIsaac, Y. Sun, T. Tran, **X. Zhang***, J. Fogarty, G. Hayes, J. Mankoff*

[2018 UIST] Robust Annotation of Mobile Application Interfaces in Methods for Accessibility Repair
X. Zhang*, A. Ross, J. Fogarty* • VIDEO

[2018 ASSETS] Interactiles: 3D Printed Tactile Interfaces on Phone to Enhance Mobile Accessibility
X. Zhang*, T. Tran, Y. Sun, I. Culhane, J. Fogarty, J. Mankoff* • VIDEO

[2018 ASSETS] (Best Paper Nominee) Examining Image-Based Button Labeling for Accessibility in Apps through Large-Scale Analysis
A. Ross, **X. Zhang***, J. Fogarty, J. O. Wobbrock* • PAPER

[2018 VL/HCC] APPINITE: A Multi-Modal Interface for Specifying Data Descriptions in Programming by Demonstration Using Verbal Instructions
T. Li, I. Labutov, X. Li, **X. Zhang***, W. Shi, W. Ding, T. Mitchell and B. A. Myers* • VIDEO

[2018 Ubicomp] Beacon: Designing a Portable Device for Self-Administering a Measure of CFF
R. Karkar, R. Kocielnik, **X. Zhang***, J. Fogarty, G N. Ioannou, S A. Munson, J. Zia*

[2017 ASSETS] (Best Paper Nominee) Epidemiology as a Framework for Large-Scale Mobile Application Accessibility Assessment
A. Ross, **X. Zhang***, J. Fogarty, J. O. Wobbrock*

[2017 CHI] Interaction Proxies for Runtime Repair and Enhancement of Mobile Application Accessibility
X. Zhang, *A. Ross, A. Caspi, J. Fogarty, J. O. Wobbrock* • VIDEO • PAPER

[2017 CHI] Smartphone-Based Eye Gesture Communication for People with Motor Disabilities
X. Zhang, *H. Kulkarni, M. R. Morris* • VIDEO • PAPER

[2016 CHI] Examining Unlock Journaling with Diaries and Reminders for In Situ Self-Report in Health & Wellness
X. Zhang, *L. Pina, J. Fogarty* • VIDEO

[2015 UIST] Leveraging Dual-Observable Input for Fine-Grained Thumb Interaction Using Forearm EMG
D. Huang, **X. Zhang**, *S. Saponas, J. Fogarty, S. Gollakota* • VIDEO

[2015 IEEE Intelligent Systems] FridgeNet: A Nutrition & Social Activity Promotion Platform for Aging Population
Y. Lee, M-C Huang, **X. Zhang**, *W. Xu*

[2014 IEEE Biomedical and Health Informatics] BreathSens: A Continuous On-Bed Respiratory Monitoring System With Torso Localization Using an Unobtrusive Pressure Sensing Array
J. Liu, M-C Huang, W. Xu, **X. Zhang**, *L. Stevens, N. Alshurafa, M. Sarrafzadeh*

[2014 IEEE Biomedical and Health Informatics] Using Pressure Map Sequences for Recognition of On Bed Rehabilitation Exercises
M-C. Huang, J. Liu, W. Xu, N. Alshurafa, **X. Zhang**, *M. Sarrafzadeh*

[2013 BodyNets] See UV on Your Skin: An Ultraviolet Sensing and Visualization System
X. Zhang, *W. Xu, M-C. Huang, F. Ren, N. Amini*

[2013 BodyNets] Proper Running Posture Guide: A Wearable Biomechanics Capture System
X. Zhang, *M-C. Huang, F. Ren, W. Xu, N. Guan, W. Yi*

Patent

On-the-fly Calibration For Improved On-device Eye Tracking (Detail)

Pixel-based Optimization For A User Interface (Detail)

Methods And Systems For Self-administered Measurement Of Critical Flicker Frequency (Detail)

Automated E-tran Application (Detail)

User Interface Control Using Gaze Tracking (Detail)

Media Coverage

2020   **iPhones Can Now Automatically Recognize and Label Buttons and UI Features for Blind Users**
TechCrunch reported Screen Recognition feature in iOS 14.

2017   **Microsoft App Helps People with ALS Speak Using Just Their Eyes**
Reported by Newsweek / The Telegraph / New Scientist / BGR / Business Standard and 50+ medias.