

# JASON WU

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## EDUCATION

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### **Carnegie Mellon University**

*August 2018 - Present*

Advisor: Jeffrey Bigham

Ph.D. Human-Computer Interaction

Human-Computer Interaction Institute

### **Carnegie Mellon University**

*May 2022*

Advisor: Jeffrey Bigham

Masters of Human-Computer Interaction

Human-Computer Interaction Institute

### **Georgia Institute of Technology**

*August 2015 - May 2018*

B.S. Computer Science (Intelligence & Information Internetworks)

*Highest Honors*

## AWARDS & HONORS

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Heidelberg Laureate Forum Young Researcher (2023)

CHI Best Paper Honorable Mention (2023)

CHI Best Paper (2021)

W4A Best Technical Paper (2021)

CHI Best Paper Honorable Mention (2020)

Fast Company Innovation by Design Student Finalist (2020)

NSF Graduate Research Fellowship (2019-2024)

Georgia Tech College of Computing Outstanding Undergraduate Researcher (2018)

HackGT - Best Microsoft Technology Award (2017)

MARTAHack - Implementation Prize Runner Up (2017)

HackStart - First Place Winner (2015)

Zell-Miller Scholarship (2015-2018)

NMSQT Georgia Pacific Corporate Scholarship (2015-2018)

## DISSERTATIONS

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### **Synchronous Interfaces for Wearable Computers**

May 2018

*Undergraduate Dissertation*

*Georgia Institute of Technology*

Researched synchronous interfaces for wearable computers, which are a type of input system that allows users to express intent by performing an action in sync with stimuli presented to them

## JOURNAL PUBLICATIONS

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- [J.2] **ScratchThat: Supporting Command-Agnostic Speech Repair in Voice-Driven Assistants**  
*Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies 2019 Issue 2*  
Jason Wu, Karan Ahuja, Richard Li, Victor Chen, Jeffrey P. Bigham

- [J.1] **SynchroWatch: One-Handed Synchronous Smartwatches Gestures Using Correlation and Magnetic Sensing**  
*Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies 2017 Issue 4*  
Gabriel Reyes, Jason Wu, Nikita Juneja, Maxim Goldshtein, W. Keith Edwards, Gregory D. Abowd, Thad Starner

## CONFERENCE PAPERS

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- [C.18] **Never-ending Learning of User Interfaces**  
*Proceedings of UIST 2023, ACM Symposium on User Interface Software and Technology*  
Jason Wu, Rebecca Krosnick, Eldon Schoop, Amanda Swearngin, Jeffrey P. Bigham, Jeffrey Nichols
- [C.17] **STAR: Smartphone-Analogous Typing in Augmented Reality**  
*Proceedings of UIST 2023, ACM Symposium on User Interface Software and Technology*  
Taejun Kim, Amy Karlson, Aakar Gupta, Tovi Grossman, Jason Wu, Parastoo Abtahi, Christopher Collins, Michael Glueck, Hemant Surale
- [C.16] **WebUI: A Dataset for Enhancing Visual UI Understanding with Web Semantics (Best Paper Honorable Mention ★)**  
*Proceedings of CHI 2023, ACM Conference on Human Factors in Computing Systems*  
Jason Wu, Siyan Wang, Siman Shen, Yi-Hao Peng, Jeffrey Nichols, Jeffrey P. Bigham
- [C.15] **Diffscriber: Describing Visual Design Changes to Support Mixed-Ability Presentation Authoring**  
*Proceedings of UIST 2022, ACM Symposium on User Interface Software and Technology*  
Yi-Hao Peng, Jason Wu, Jeffrey P. Bigham, Amy Pavel
- [C.14] **Understanding Screen Relationships from Screenshots of Smartphone Applications**  
*Proceedings of IUI 2022, International Conference on Intelligent User Interfaces*  
Shirin Feiz Disfani, Jason Wu, Xiaoyi Zhang, Amanda Swearngin, Titus Barik, Jeffrey Nichols
- [C.13] **Towards Complete Icon Labeling in Mobile Applications**  
*Proceedings of CHI 2022, ACM Conference on Human Factors in Computing Systems*  
Jieshan Chen, Amanda Swearngin, Jason Wu, Titus Barik, Jeffrey Nichols, Xiaoyi Zhang
- [C.12] **MultiBench: Multiscale Benchmarks for Multimodal Representation Learning**  
*Proceedings of the Neural Information Processing Systems Track on Datasets and Benchmarks 2021*  
Paul Pu Liang, Yiwei Lyu, Xiang Fan, Zetian Wu, Yun Cheng, Jason Wu, Leslie Yufan Chen, Peter Wu, Michelle A Lee, Yuke Zhu, Russ Salakhutdinov, Louis-Philippe Morency
- [C.11] **Screen Parsing: Towards Reverse Engineering of UI Models from Screenshots**  
*Proceedings of UIST 2021, ACM Symposium on User Interface Software and Technology*  
Jason Wu, Xiaoyi Zhang, Jeffrey Nichols, Jeffrey P. Bigham
- [C.10] **Screen Recognition: Creating Accessibility Metadata for Mobile Applications from Pixels (Best Paper Award 🏆)**  
*Proceedings of CHI 2021, ACM Conference on Human Factors in Computing Systems*  
Xiaoyi Zhang, Lilian de Greef, Amanda Swearngin, Samuel C. White, Kyle Murray, Lisa Yu, Qi Shan, Jeffrey Nichols, Jason Wu, Chris Fleizach, Aaron Everitt, Jeffrey P. Bigham
- [C.9] **When Can Accessibility Help?: An Exploration of Accessibility Feature Recommendation on Mobile Devices (Best Technical Paper Award 🏆)**  
*Proceedings of W4A 2021, the 18th International Web for All Conference*  
Jason Wu, Gabriel Reyes, Samuel C. White, Xiaoyi Zhang, Jeffrey P. Bigham
- [C.8] **Making Mobile Augmented Reality Applications Accessible**  
*Proceedings of ASSETS 2020, ACM Conference on Computers and Accessibility*

Jaylin Herskovitz, [Jason Wu](#), Samuel C. White, Amy Pavel, Anhong Guo, Gabriel Reyes, Jeffrey P. Bigham

- [C.7] **Disability and the COVID-19 Pandemic: Using Twitter to Understand Accessibility during Rapid Societal Transition**  
*Proceedings of ASSETS 2020, ACM Conference on Computers and Accessibility*  
Cole Gleason, Stephanie Valencia-Valencia, Lynn Kirabo, [Jason Wu](#), Anhong Guo, Elizabeth J. Carter, Jeffrey P. Bigham, Cynthia L. Bennett, and Amy Pavel
- [C.6] **Automatic Class Discovery and One-Shot Interactions for Acoustic Activity Recognition**  
(Best Paper Honorable Mention ★)  
*Proceedings of CHI 2020, ACM Conference on Human Factors in Computing Systems*  
[Jason Wu](#), Chris Harrison, Jeffrey P. Bigham, Gierad Laput
- [C.5] **SelfSync: Exploring Self-synchronous Body-based Hotword Gestures for Initiating Interaction**  
*Proceedings of ISWC 2019, ACM International Symposium on Wearable Computers*  
Juyoung Lee, Shaurye Aggarwal, [Jason Wu](#), Thad Starner, Woontack Woo
- [C.4] **TongueBoard: An Oral Interface for Subtle Input**  
*Proceedings of AH 2019, ACM 10th Augmented Human International Conference 2019*  
Richard Li, [Jason Wu](#), Thad Starner
- [C.3] **NADiA - Neural Network Driven Virtual Human Conversation Agents**  
*Proceedings of IVA 2018, ACM International Conference on Intelligent Virtual Agents*  
[Jason Wu](#), Sayan Ghosh, Mathieu Chollet, Steven Ly, Sharon Mozgai, and Stefan Scherer
- [C.2] **SeeSaw - Rapid One-Handed Synchronous Gesture Interface for Smartwatches**  
*Proceedings of ISWC 2018, ACM International Symposium on Wearable Computers*  
[Jason Wu](#), Cooper Colglazier, Adhithya Ravishankar, Yuyan Duan, Yuanbo Wang, Thomas Ploetz, Thad Starner
- [C.1] **Whoosh: Non-Voice Acoustics for Low-Cost, Hands-Free, and Rapid Input on Smartwatches**  
*Proceedings of ISWC 2016, ACM International Symposium on Wearable Computers*  
Gabriel Reyes, Dingtian Zhang, Sarthak Ghosh, Pratik Shah, [Jason Wu](#), Aman Parmani, Bailey Bercik, Thad Starner, Gregory D. Abowd, W. Keith Edwards

## POSTERS & WORKSHOP PAPERS

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- [W.6] **Using LLMs to Customize the UI of Webpages**  
*Adjunct Proceedings of UIST 2023, ACM Symposium on User Interface Software and Technology*  
Amanda Li, [Jason Wu](#), Jeffrey P. Bigham
- [W.5] **Towards Never-ending Learning of User Interfaces**  
*AI & HCI Workshop at the 40th International Conference on Machine Learning (ICML)*  
[Jason Wu](#), Rebecca Krosnick, Eldon Schoop, Amanda Swearngin, Jeffrey P. Bigham, Jeffrey Nichols
- [W.4] **Ability-Based Optimization of Existing UIs**  
*CHI 2022 Workshop on Computational Approaches for Understanding, Generating, and Adapting User Interfaces*  
[Jason Wu](#), Jeffrey Nichols, Jeffrey P. Bigham
- [W.3] **Towards Recommending Accessibility Features on Mobile Devices**  
*Proceedings of ASSETS 2020, ACM Conference on Computers and Accessibility*  
[Jason Wu](#), Gabriel Reyes, Samuel C. White, Xiaoyi Zhang, Jeffrey P. Bigham

- [W.2] **Supporting Speech Repair in Voice-Driven Assistants**  
*CHI 2019 Workshop on Mapping Theoretical and Methodological Perspectives for Understanding Speech Interface Interactions*  
 Jason Wu, Karan Ahuja, Richard Li, Victor Chen, Jeffrey P. Bigham
- [W.1] **NADiA - Towards Neural Network Driven Virtual Human Conversation Agents**  
*Proceedings of the 17th International Conference on Autonomous Agents and Multi-Agent Systems*  
 Jason Wu, Sayan Ghosh, Mathieu Chollet, Steven Ly, Sharon Mozgai, and Stefan Scherer

## OTHER PUBLICATIONS

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- [O.3] **Screen Correspondence: Mapping Interchangeable Elements between UIs**  
*arXiv preprint arXiv:2301.08372*  
 Jason Wu, Amanda Swearngin, Xiaoyi Zhang, Jeffrey Nichols, Jeffrey P Bigham
- [O.2] **Reflow: Automatically Improving Touch Interactions in Mobile Applications through Pixel-based Refinements**  
*arXiv preprint arXiv:2207.07712*  
 Jason Wu, Titus Barik, Xiaoyi Zhang, Colin Lea, Jeffrey Nichols, Jeffrey P Bigham
- [O.1] **Extracting Replayable Interactions from Videos of Mobile App Usage**  
*arXiv preprint arXiv:2207.04165*  
 Jieshan Chen, Amanda Swearngin, Jason Wu, Titus Barik, Jeffrey Nichols, Xiaoyi Zhang

## INVITED TALKS

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- [T.4] **Computational Understanding of User Interfaces**  
*University of California Berkeley, BiD Seminar* October 24, 2023
- [T.3] **Computational Understanding of User Interfaces**  
*Saarland University* October 6, 2023
- [T.2] **Ability-Based Optimization of User Interfaces**  
*Stanford HCI Lunch Talk* December 7, 2022
- [T.1] **Ability-Based Optimization of User Interfaces**  
*University of Toronto, Dynamic Graphics Project* November 11, 2022

## SELECTED MEDIA COVERAGE

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- [S.20] **FCC** FCC Announces Winners of Chair's Awards for Advancements in Accessibility 2021
- [S.19] **Apple ML Blog** Making Mobile Applications Accessible with Machine Learning 2021
- [S.18] **CMU SCS News** CMU, Apple Team Improves iOS App Accessibility 2021
- [S.17] **Apple** New features available with iOS 14 2020
- [S.16] **TechCrunch** iPhones can now automatically recognize and label buttons and UI features for blind users 2020
- [S.15] **Fast Company** The best student-design projects of 2020 2020
- [S.14] **AppleInsider** Siri may improve accuracy by mapping the room like a HomePod does 2020
- [S.13] **TechCrunch** Apple and CMU researchers demo a low friction learn-by-listening system for smarter home devices 2020
- [S.12] **Android Authority** What if your smart speaker could react to sounds in your home? 2020
- [S.11] **Carnegie Mellon HCII News** Wu Receives National Science Foundation Graduate Research Fellowship 2019
- [S.10] **Eureka Alert** New techniques allow greater control of smartwatches 2017
- [S.9] **Georgia Tech President's Newsletter** Improving Smartwatches 2017

[S.8] **R&D World** New Techniques Allow Greater Control of Smartwatches 2017

[S.7] **Gizbot** New technology lets you control smartwatch using breath and skin 2017

[S.6] **Yahoo! Tech** Breathe in, breathe out: New technique controls smartwatch using breath and skin 2017

[S.5] **Digital Trends** Breathe in, breathe out: New technique controls smartwatch using breath and skin 2017

[S.4] **Georgia Tech GVU Center** Gaining Greater Control of Smartwatches 2017

[S.3] **Georgia Tech ECE** New Techniques Allow Greater Control of Smartwatches 2017

[S.2] **YouTube – Georgia Tech** Interactive Techniques for Smartwatches 2017

[S.1] **Georgia Tech News Center** New Techniques Allow Greater Control of Smartwatches 2017

## EMPLOYMENT

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**CMU Human-Computer Interaction Institute** August 2018 - Present  
*Graduate Research Assistant*

- Developed accessible interactions for novel computing devices and modalities
- Researched methods for automatically detecting and addressing accessibility needs in mobile devices
- Explored sensing techniques for enabling intelligent and interactive environments

**Apple Inc.** December 2022 - Present  
*Machine Learning Research Intern*

- Developed machine learning models for predicting semantics from user interfaces
- Developed systems for improving the accessibility and usability of mobile apps

**Meta Platforms Inc.** August 2022 - December 2022  
*Research Scientist Intern*

- Researched user interfaces for augmented reality and virtual reality
- Applied computational methods to interaction and interface design

**Apple Inc.** April 2019 - July 2022  
*Machine Learning + Accessibility Research Engineer (Contractor)*

- Prototyped systems for improving accessibility of mobile technologies
- Researched machine learning and sensor-driven interaction techniques

**Google AI Perception Team** June 2018 - August 2018  
*Software Engineering Intern, Research Role*

- Prototyped novel interfaces for subtle control of wearable devices
- Integrated audio accessibility features into wearable devices

**Georgia Tech Ubicomp Lab** January 2016 - May 2018  
*Undergraduate Researcher*

- Explored methods for inferring lung-health from smartphone data using passive sensing
- Researched novel input interactions for smartwatches and head worn displays
- Served as mentor for graduate research group that explored input interfaces for wearable computers

**USC Institute for Creative Technologies** June 2017 - August 2017  
*Undergraduate Research Intern*

- Trained deep learning models for visual affect recognition
- Integrated affective language models, character animation system, and deep vision models to create a mobile virtual human system

## Agency Oasis

June 2015 - August 2015

*Web Development Intern*

- Worked with C#, SQL Server, and Sitecore, an enterprise-grade .NET CMS
- Wrote software to automate and import Harvest timesheet data into Excel

## TEACHING

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### **CMU 05-410/05-610 User-Centered Research & Evaluation**

January 2022 - May 2022

*Graduate Teaching Assistant*

- Taught lab section of 20 students
- Helped prepare teaching materials for user-centered research
- Helped create and grade assignments and tests

### **CMU 05-430/05-630 Programming User Interfaces**

August 2021 - December 2021

*Graduate Teaching Assistant*

- Taught lab section of 20 students
- Helped prepare teaching materials for web-based UI development
- Helped create and grade assignments and tests

### **Georgia Tech CS4605/CS7470 Mobile & Ubiquitous Computing**

January 2018 - May 2018

*Project Mentor*

- Mentored two groups of 4 students on projects related to mobile and ubiquitous computing
- Guided student-led course projects on input techniques for wearables and mobile games for asthma
- One group project resulted in a publication to international peer-reviewed conference (ISWC)

## VOLUNTEERING & SERVICE

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Organizing Committee (Student Innovation Contest Co-chair) for UIST 2023

Organizing Committee (Web Co-chair) for ASSETS 2022

Program Committee for FAccT 2023

Program Committee for CHI Late-Breaking Work 2022, 2023

Program Committee for CHI 2022 Workshop: Computational Approaches for Understanding, Generating, and Adapting User Interfaces

Area Chair for ICML 2023 Workshop: Artificial Intelligence & Human-Computer Interaction

Volunteer for CMU HCII PhD Application Support Program 2020, 2021, 2022

Reviewer for NeurIPS Workshop on Human Evaluation of Generative Models 2022

Reviewer for TOCHI 2022

Reviewer for NeurIPS Datasets and Benchmarks 2022

Reviewer for IMWUT 2019, 2022

Reviewer for DIS 2022

Reviewer for CHI 2020, 2021, 2022\*, 2023, 2024

Reviewer for CHI Late-Breaking Work 2020, 2021, 2022, 2023

Reviewer for EICS 2020, 2021, 2022

Reviewer for International Journal of Human-Computer Studies 2021

Reviewer for IUI 2020

Reviewer for UIST 2019, 2020\*, 2021\*, 2022\*\*, 2023

Reviewer for SIGGRAPH Posters 2023

Student Volunteer for ASSETS 2019

**MENTORING AND ADVISING**

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<b>Amanda (Xin Yue) Li</b> (CMU - Undergraduate Research)	Spring 2023
<b>Siyan Wang</b> (CMU - HCII REU)	Summer 2022
<b>Siman Shen</b> (CMU - HCII REU)	Summer 2022
<b>Katerina Nikiforova</b> (CMU - Undergraduate Research)	Spring 2022
<b>Cooper Colglazier</b> (Georgia Tech - Project Mentor)	Spring 2018
<b>Adhithya Ravishankar</b> (Georgia Tech - Project Mentor)	Spring 2018
<b>Yuyan Duan</b> (Georgia Tech - Project Mentor)	Spring 2018
<b>Yuanbo Wang</b> (Georgia Tech - Project Mentor)	Spring 2018

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\* Indicates Special Recognition for review