

# Mingyuan Zhong

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## EDUCATION

### **University of Washington**

*Ph.D. Student in Computer Science & Engineering*

Advisors: James Fogarty & Jacob Wobbrock

Seattle, WA

Sep. 2019–present

### **Tsinghua University**

*Bachelor of Engineering in Computer Science & Technology*

Beijing, China

Aug. 2014–July 2019

## PUBLICATIONS

- **Mingyuan Zhong**, Chun Yu, Qian Wang, Xuhai Xu, Yuanchun Shi: ForceBoard: Subtle Text Entry Leveraging Pressure. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. (CHI '18)
- Chun Yu, Ke Sun, **Mingyuan Zhong**, Xincheng Li, Peijun Zhao, Yuanchun Shi: One-Dimensional Handwriting: Inputting Letters and Words on Smart Glasses. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. (CHI '16, Honorable Mention)
- Chun Yu, Ke Sun, **Mingyuan Zhong**, Xincheng Li, Yuanchun Shi: One-Dimensional Handwriting Input Method and Apparatus. Chinese Patent, Pub No. CN105549890A.

## RESEARCH EXPERIENCE

- **Mobile Accessibility Repair at Scale**  
*University of Washington | Advisors: James Fogarty & Jacob Wobbrock* 2019–present
  - Periodically crawled over 300 Android apps for one year to gather accessibility data.
  - Analyzed accessibility failures and utilized heuristics, neural networks, and the crowd to create repairs.
- **Automatic Generation of Contextual Visual Mobile Tutorials**  
*Google Research | Hosts: Yang Li & Gang Li* Summer 2020
  - Created a pipeline that automatically generates visual tutorials for mobile tasks from raw text instructions.
  - Addressed errors and incompatibility from automatic tutorial generation using beam search and look-ahead.
- **UI Design Exploration Using Crowd Genetic Programming**  
*Google Research | Hosts: Yang Li & Gang Li* Summer 2020
  - Created an HTML markup extension that allows designers to specify alternatives for design search.
  - Designed an enhanced genetic algorithm that can efficiently explore a large design space using crowd responses.
  - Integrated general tool support that allows designers to improve web design quickly at a low cost.
- **Understanding Mobile UI Elements and Animations for Accessibility**  
*HCI Lab, Tsinghua University | Advisor: Chun Yu* Spring 2019
  - Developed an algorithm that classified UI elements into 11 semantic categories by combining rule-based and computer vision techniques.
  - Developed a system that analyzed transition animations, including scrolling, navigation, and loading.
- **Quantifying the User Perception of Janks in Transition Animations**  
*HCI Lab, Tsinghua University | Advisors: Chun Yu & Jingyu Zhang* 2018–present
  - Built a platform that automatically interacted with Android devices and captured their displays using a high-speed camera; developed a program that analyzed the captured footage to identify janks.
  - Designed an Android application that inserted janks during user interaction, which included four common scenarios, and gathered user feedback.
  - Conducted a large-scale *in-the-wild* experiment of over 3900 people.

- **TenseInput: Augmenting Gesture Interaction with Muscle Contraction**

*GIX, Tsinghua University & University of Washington*

*Summer 2018*

- Sensing scheme: Designed and assembled a wearable device to gather electromyography (EMG), motion, and pressure data from muscle contractions.
- Classification models: Designed CNN- and RNN-based models to detect muscle contraction.
- Interaction scenarios: Implemented three interaction scenarios to evaluate the practicality of this technique.

- **ForceBoard: Subtle Text Entry Leveraging Pressure**

*HCI Lab, Tsinghua University | Advisors: Yuanchun Shi & Chun Yu*

*2016–2017*

- Interaction design: Proposed and designed a one-dimensional pressure-based text entry method.
- Pressure control model: Conducted a user study to examine people’s ability of continuous pressure control.
- Prototyping and evaluation: Implemented a ForceBoard prototype, which enabled text entry by combining the pressure control model and statistical decoding; conducted a user study to evaluate its performance.

- **One-Dimensional Handwriting: Gesture-based Text Entry**

*HCI Lab, Tsinghua University | Advisors: Yuanchun Shi & Chun Yu*

*2015–2016*

- Pilot Study: Conducted a user-participatory study to solicit designs of one-dimensional gestures for text entry.
- Prototyping: Developed a prototype 1D Handwriting keyboard on Google Glass, where users could use one-dimensional gestures that felt familiar to input letters and words, similar to handwriting.
- Evaluation: Conducted user studies to assess the text entry performance; implemented the 1Line Keyboard on Google Glass and to compare performance.

## HONORS AND AWARDS

- Tsinghua University Scholarship for Technological Innovation *Oct. 2018*
- Special Award, 36th Tsinghua University Challenge Cup (6/302) *Apr. 2018*
- Evernote (China) Innovation Award (Top 2%) *Apr. 2018*
- ACM CHI '16 Honorable Mention *Apr. 2016*

## TEACHING EXPERIENCE & SERVICE

- **Teaching Assistant:** *Embedded Systems Capstone* with Bruce Hemingway (UW CSE/EE 475). *Autumn 2019*
- **Peer Reviewer:** ACM IUI 2019, 2020, 2021; ACM CHI LBW 2020.

## SKILLS

- **Programming Language:** C++ · Python · Java · JavaScript · Swift · Golang · VHDL
- **Technology:** Android · iOS · Linux · Arduino · OpenCV · OptiTrack · Keras · Unity · Django · Flask · SQL · Azure
- **Data Analysis:** R · SPSS · JMP · MATLAB
- **Media:** Photoshop · Premiere Pro · Lightroom