Suwen Zhu

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EDUCATION

Stony Brook University, *Stony Brook, NY* 2013/08 - 2019/12
Doctor of Philosophy, Computer Science, GPA: 3.74/4.0
Dissertation: Model-Based Intelligent Interactions on Touch Surfaces. *Advisor*: Prof. Xiaojun Bi

Central University of Finance and Economics, *Beijing, China* 2009/09 - 2013/07
Bachelor of Engineering, Computer Science, GPA: 95/100 (Rank 1/32), Honor Graduate of Beijing

EXPERIENCE

Software Engineer 2020/02 - Now
Grammarly, Inc., *San Francisco, CA*

Research Assistant 2016/08 - 2019/12
Human-Computer Interaction Lab, Stony Brook University, advised by Prof. Xiaojun Bi, *Stony Brook, NY*

Software Engineering Intern 2016/05 - 2016/09
Google, Android UX/Research, supervised by Xiaojun Bi and Shumin Zhai, *Mountain View, CA*

Research Assistant 2014/01 - 2015/12
RiS3 Lab, Stony Brook University, advised by Prof. Long Lu, *Stony Brook, NY*

PUBLICATIONS

[10] **BackSwipe: Back-of-device Word-Gesture Interaction on Smartphones**
Wenzhe Cui, **Suwen Zhu**, Zhi Li, Zheer Xu, Xing-Dong Yang, IV Ramakrishnan, Xiaojun Bi. *CHI'21*.

[9] **JustCorrect: Intelligent Post Hoc Text Correction Techniques on Smartphones**
Wenzhe Cui, **Suwen Zhu**, Mingrui Ray Zhang, H. Andrew Schwartz, Jacob O. Wobbrock, Xiaojun Bi. *UIST'20*.

[8] **Using Bayes' Theorem for Command Input: Principle, Models, and Applications**
Suwen Zhu, Yoonsang Kim, Jingjie Zheng, Jennifer Yi Luo, Ryan Qin, Liuping Wang, Xiangmin Fan, Feng Tian, Xiaojun Bi. *CHI'20*.

[7] **i'sFree: Eyes-Free Gesture Typing via a Touch-Enabled Remote Control**
Suwen Zhu, Jingjie Zheng, Shumin Zhai, Xiaojun Bi. *CHI'19*.

[6] **Typing on an Invisible Keyboard**
Suwen Zhu, Tianyao Luo, Xiaojun Bi, Shumin Zhai. *CHI'18*.

[5] **Optimal-T9: An Optimized T9-like Keyboard for Small Touchscreen Devices**
Ryan Qin, **Suwen Zhu**, Yu-Hao Lin, Yu-Jung Ko, and Xiaojun Bi. *ISS'18*.
Best Paper Honorable Mention

[4] **Ultra-Low-Power Mode for Screenless Mobile Interaction**
Jian Xu, **Suwen Zhu**, Aruna Balasubramanian*, Xiaojun Bi*, Roy Shilkrot*. *UIST'18*.

[3] **Why Is Gesture Typing Promising for Older Adults?: Comparing Gesture and Tap Typing Behavior of Older with Young Adults**
Yu-Hao Lin, **Suwen Zhu**, Yu-Jung Ko, Wenzhe Cui, Xiaojun Bi. *ASSETS'18*.

[2] **Towards Virtual Reality Infinite Walking**
Qi Sun, Anjul Patney, Li-Yi Wei, Omer Shapira, Jingwan Lu, Paul Asente, **Suwen Zhu**, Morgan Mcguire, David Luebke, Arie Kaufman. *SIGGRAPH'18*.

[1] **CASE: Comprehensive Application Security Enforcement on COTS Mobile Devices**
Suwen Zhu, Long Lu, and Kapil Singh. *MobiSys'16*.

PROJECTS

Intelligent command input with machine learning. 2018/07 - 2019/12
- Proposed a machine learning-based principle to improve command input accuracy.
- Developed models and applied the principle to pointing and gesture command interfaces.
- Applied natural language processing techniques to develop intelligent text entry systems.

Assistive interaction systems. 2017/05 - 2020/02
- Modeled the typing behaviors of young and older adults and analyzed its implications on keyboard design.
- Conducted semi-structured interviews with older adults to understand how to improve the keyboard decoding and interface design for them.
- Jointly designed eye gaze-based interaction systems for ALS patients on the iOS platform, which supports the needs of both patients and caregivers, including speaking, writing, and using a phone.

Redirected walking in VR. 2017/09 - 2018/02
- Conducted perceptual studies on redirected walking in virtual reality: a system which leverages saccadic suppression to change VR users' walking paths without being noticed.

Computational layout design for multi-key keyboards. 2017/07 - 2018/09
- Jointly designed and developed an optimization framework for multi-key keyboard layout design.
- Implemented the optimal layout on watch-size devices and conducted empirical evaluation.

Eyes-free interaction on remote displays. 2017/04 - 2018/12
- Studied users' eyes-free interaction behaviors on remote displays (e.g., TVs, VR/AR).
- Designed algorithms to support a gesture-based text entry system, informed by previous observations.
- Developed and evaluated the system with novice and expert users with empirical studies.

Touchscreen keyboard with invisible or screen-less interfaces. 2016/05 - 2018/08
- Empirical studied users' typing patterns on keyboards with various levels of visibility.
- Explored the design space invisible and partially invisible keyboards.
- Developed the UI and decoding algorithms of an invisible touchscreen keyboard and conducted a longitudinal study for performance evaluation.
- Redesigned the keyboard layout and incorporated gesture triggers to support text entry without visual feedback, which exhibits significant power savings.

Module-level security enforcement for Android applications. 2014/01 - 2015/12
- Conducted a comprehensive analysis of security violations caused by malicious modules within applications.
- Designed and implemented the defense mechanism by mediating all cross-module interactions.
- Developed a patching tool that injects developer-defined security policies into complied app packages.

SKILLS

Programming languages: C++, Java, Python, SQL, PostgreSQL, R, C#, XML, JavaScript, HTML, Matlab
Systems and tools: PyTorch, TensorFlow, Linux, Android, Windows, Git, Unity Engine, Gradle, LaTeX

AWARDS

Best Paper Honorable Mention, ACM ISS '18 2018
Stony Brook Computer Science Fellowship, Stony Brook University 2013-2014