# Weijia He

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## RESEARCH INTEREST

IoT Security & Privacy; Usable Security & Privacy; Human-Computer Interaction (HCI)

## EDUCATION

**University of Chicago, Chicago, IL** **Sep. 2017 - Present**
*Ph.D in Computer Science* (fourth year currently, expect in Jun. 2023)

**Shanghai Jiao Tong University, Shanghai, China** **Sep. 2013 - Jul. 2017**
*Bachelor of Science in Information Security*

## Employment

**Graduate Research Assistant** **Sep.2017 – Present**
*SUPER Group, University of Chicago*

**Undergraduate Research Assistant** **Mar.2016- Dec. 2016**
*LoCCS Lab, Shanghai Jiao Tong University*

## PUBLICATIONS

**Rethinking Authentication and Access Control for the Home Internet of Things (IoT)**
**Weijia He**, Maximilian Golla, Roshni Padhi, Jordan Ofek, Markus Dürmuth, Earlence Fernandes, Blase Ur
In *Proceedings of the 27th USENIX Security Symposium (USENIX Security'18)*, Baltimore, MD, 2018.

**Trace2TAP: Synthesizing Trigger-Action Programs From Traces of Behavior**
Lefan Zhang, **Weijia He**, Olivia Morkved, Valerie Zhao, Michael L. Littman, Shan Lu, Blase Ur.
In *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies 4, 3, Article 104 (IMWUT / UbiComp). Online, September 2020.*

**AutoTap: Synthesizing and Repairing Trigger-Action Programs Using LTL Properties**
Lefan Zhang, **Weijia He**, Jesse Martinez, Noah Brackenbury, Shan Lu, Blase Ur.
In *Proceedings of the 41st ACM/IEEE International Conference on Software Engineering (ICSE)*. Montreal, QC, Canada, 2019.

**How Users Interpret Bugs in Trigger-Action Programming**
Will Brackenbury, Abhimanyu Deora, Jillian Ritchey, Jason Vallee, **Weijia He**, Guan Wang, Michael L. Littman, Blase Ur
In *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)*. Glasgow, UK, 2019.

**When Smart Devices Are Stupid: Negative Experiences Using Home Smart Devices**
**Weijia He**, Jesse Martinez, Roshni Padhi, Lefan Zhang, Blase Ur.
In *Proceedings of the IEEE Workshop on the Internet of Safe Things*. San Francisco, CA, 2019.

**Clap On, Clap Off: Usability of Authentication Methods in the Smart Home**
**Weijia He**, Juliette Hainline, Roshni Padhi, Blase Ur
*Proceedings of the Interactive Workshop on the Human Aspect of Smarthome Security and Privacy (WSSP).* Baltimore, MD, 2018.

## RESEARCH EXPERIENCES

### Firewall Rules Generation based on Traffic Data from Smart Devices
Jan.2020 - Present

***Key Word: Security, IoT, Traffic Analysis***

Advisor: Blase Ur (University of Chicago), Nick Feamster (University of Chicago),.

- Statistically generated firewall rules for smart home devices based on a 10 GB smart home network traffic dataset.
- Implementing generated firewall rules on real-world smart home devices.

### Multi-User Authentication and Access Control in the Internet of Things
Jul. 2017 - Present

***Key Word: Security, Privacy, HCI, Smart Home***

Advisor: Blase Ur (University of Chicago)

- Proposed access-control specification for the multi-user home IoT based on relationships, capabilities and contexts.
- Discovered the frequent context-dependence of access-control policies from a 425-participant user study. Identified 11 contextual factors that future interfaces should support.
- Mapped desired contexts to sensing mechanisms, evaluated existing sensing technologies in terms of security, privacy, and usability, and explored the design trade-offs for future research and implementation.

### Trigger-Action Programming in the Internet of Things
Jan.2018 – Aug. 2020

***Key Word: HCI, Smart Home***

Advisor: Blase Ur (University of Chicago)

- Implemented customized trigger-action rule-creation website based on Samsung SmartThings.
- Designed a 72-participant survey to understand how end-users creates rules for a given scenario, comparing their behavior in face of trigger-action rule creation or safety-property creation.
- Designed and conducted a field study of synthesizing trigger-action rules based on users' own activities.

### A Security Study of Authenticators in Single-Sign-On
Jan. 2016 - Mar. 2016

***Key Word: SSO, Authentication, Online Social Network***

Advisor: Yuanyuan Zhang (Shanghai Jiao Tong University)

- Conducted a fuzz test on the SSO(Single-Sign-On) implementations on 65 most popular Android apps in Chinese app market by using Burp Suite.
- Discovered that some apps tried to authenticate users with insecure authenticators through traffic analysis.

## SERVICES

- **Artifact Evaluation Committee Member**, The 30th Usenix Security Symposium, 2021.
- **Shadow PC member**, The 41st IEEE Symposium on Security and Privacy, 2020.
- **External Reviewer**, CHI 2020.
- **Reviewer,** International Journal of Human-Computer Studies.
- **PC Member**, The European Workshop on Usable Security, 2019, 2020.
- **PC Member**, The CSCW 2019 workshop, Ubiquitous Privacy: Research and Design for Mobile and IoT Platforms

## HONORS & AWARDS

- Student Travel Grant for 2019 IEEE Symposium on Security and Privacy ($1,250)
- Usenix Security 2018 Student Grant ($745)
- SOUPS 2018 Student Grant ($770)

## TEACHING EXPERIENCES

**Ethics, Fairness, Responsibility, and Privacy in Data Science (CMSC 25900)** Spring, 2020
*Teaching Assistant, University of Chicago*

**superpowHer: compileHer Tech Capstone 2019** April 2019
*Instructor*

**Usable Security and Privacy (CMSC 23210 / CMSC 33210)** Spring 2018, 2019
*Teaching Assistant, University of Chicago*

**Computer Science with Applications 1 (CMSC 12100)** Sep.2017 – Dec. 2017
*Teaching Assistant, University of Chicago*

## SKILLS

**Research Methods:** Qualitative/quantitative data analysis, field study, interview, survey
**Language:** Python, JavaScript, Java, C++, C#, Shell Script, Latex
**Hardware:** Raspberry Pi