

Jingjie Li

PH.D. CANDIDATE · UNIVERSITY OF WISCONSIN-MADISON

1415 Engineering Drive, RM 3605, Madison, WI 53706, USA

✉ jingjie.li@wisc.edu | 🏠 jingjeli.me

Education

University of Wisconsin-Madison

Madison

PH.D. COMPUTER ENGINEERING

09.2017-05.2023 (Expected)

- Department of Electrical and Computer Engineering
- Major Area: Computer Engineering, Minor Area: Computer Science
- Advisors: Prof. Younghyun Kim and Prof. Kassem Fawaz
- Research Interest: Usable Security and Privacy, Human-Centered Computing, Augmented/Virtual Reality, Internet of Things

University of Wisconsin-Madison

Madison

M.SC. COMPUTER ENGINEERING

09.2017-05.2019

- Department of Electrical and Computer Engineering

Australian National University

Canberra

B.ENG. (RESEARCH AND DEVELOPMENT) (HONOURS)

07.2015-07.2017

- Research School of Engineering
- Major: Electronic and Communication Systems | First Class Honours

Peking University

Beijing

B.ENG. (EXCHANGE STUDENT)

07.2016

- College of Engineering (PKU-ANU Summer Exchange Program)

Beijing Institute of Technology

Beijing

B.Sc. (JOINT DEGREE WITH ANU)

09.2013-07.2015

- IT Advanced Class, School of Information and Electronics
- Major: Electronic Information Engineering

Professional Experience

- 2017-Present **Research Assistant**, UW-Madison, USA
- 2022 **Research Intern**, Visa Research – Security, USA
- 2021 **Visiting Ph.D. Scholar**, Max Planck Institute for Security and Privacy, Germany (Virtual)
- 2016-2017 **Research Intern**, Commonwealth Scientific and Industrial Research Organisation, Australia
- 2015-2017 **Research Student**, ANU, Australia

Awards & Honors

- 2022 **CPS (Cyber-Physical Systems) Rising Star**, CPS-VO@National Science Foundation
- Norton Labs Graduate Fellowship Finalist**, NortonLifeLock
- 2021 **IEEE Micro Top Picks from the Computer Architecture Conferences**, IEEE
- Qualcomm Innovation Fellowship Finalist**, Qualcomm
- 2020 **Chancellor's Opportunity Fellowship**, UW-Madison
- 'Smart Cities - Smart Futures' Competition Finalist**, Foxconn
- 2019 **Chancellor's Opportunity Fellowship**, UW-Madison
- 'Smart Cities - Smart Futures' Competition Final Winner**, Foxconn
- Qualcomm Innovation Fellowship Finalist**, Qualcomm
- ACM CHI Best Paper Award**, ACM
- 2018 **ACM/IEEE ISLPED Low-Power Design Contest Award**, ACM/IEEE
- A. Richard Newton Young Student Fellowship**, Design Automation Conference (DAC)

2016 Undergraduate International Partnership Scholarship, ANU

2015 Undergraduate International Partnership Scholarship, ANU

Publications

UNDER REVIEW

Jingjie Li, Sunpreet Singh Arora, Kassem Fawaz, Younghyun Kim, Can Liu, Sebastian Meiser, Mohsen Minaei, Maliheh Shirvanian, Kim Wagner. **“I Want the Payment Process to be Cool”: Understanding How Interaction Factors into Security and Privacy Perception of Authentication in Virtual Reality**. USENIX Security Symposium, 2023 (under review).

Kaiwen Sun, **Jingjie Li**, Yixin Zou, Jenny Radesky, Christopher Brooks, Florian Schaub. **Unfulfilled Promises of Child Safety and Privacy: Portrayals and Use of Children in Smart Home Marketing**. ACM CHI (Conference on Human Factors in Computing Systems), 2023 (under review).

Di Wu, **Jingjie Li**, Zhewen Pan, Younghyun Kim, Joshua San Miguel. **A Unary Brain Computer Interface**. IEEE Micro (Special Issue on IEEE Micro Top Picks), 2023 (under review).

SECURITY AND PRIVACY

Jingjie Li, Kaiwen Sun, Brittany Huff, Anna Bierley, Younghyun Kim, Florian Schaub, Kassem Fawaz. **“It’s up to the Consumer to be Smart”: Understanding the Security and Privacy Attitudes of Smart Home Users on Reddit**. Accepted at IEEE Symposium on Security and Privacy (S&P), 2023.

Kaiwen Sun, **Jingjie Li**, Yixin Zou, Florian Schaub and Chris Brooks. **The Portrayal of Children in Smart Home Marketing**. Workshop on Kids’ Online Privacy and Safety (KOPS)@Symposium on Usable Privacy and Security, 2022.

Jingjie Li, Amrita Roy Chowdhury, Kassem Fawaz, Younghyun Kim. **Kaleido: Real-Time Privacy Control for Eye-Tracking Systems**. USENIX Security Symposium, 2021. (Acceptance Rate: 18.8%)

Yongwoo Lee, **Jingjie Li**, Younghyun Kim. **MicPrint: Acoustic Sensor Fingerprinting for Spoof-Resistant Mobile Device Authentication**. EAI MobiQuitous (International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services), 2019.

Jingjie Li, Kassem Fawaz, Younghyun Kim. **Velody: Nonlinear Vibration Challenge-Response for Resilient User Authentication**. ACM CCS (Conference on Computer and Communications Security), 2019. (Acceptance Rate: 16%)

AFFECTIVE COMPUTING

Roneel V. Sharan, Shlomo Berkovsky, Ronnie Taib, Irena Koprinska, **Jingjie Li**. **Detecting Personality Traits Using Inter-Hemispheric Asynchrony of the Brainwaves**. IEEE EMBC (Conference of Engineering in Medicine and Biology Society), 2020.

Ronnie Taib, Shlomo Berkovsky, Irena Koprinska, Eileen Wang, Yucheng Zeng, **Jingjie Li**. **Personality Sensing: Detection of Personality Traits Using Physiological Responses to Image and Video Stimuli**. ACM TIIS (Transactions on Interactive Intelligent Systems), 2020.

Shlomo Berkovsky, Ronnie Taib, Irena Koprinska, Eileen Wang, Yucheng Zeng, **Jingjie Li**, Sabina Kleitman. **Detecting Personality Traits Using Eye-Tracking Data**. ACM CHI (Conference on Human Factors in Computing Systems), 2019. (Best Paper)

POWER-EFFICIENT DESIGN

Di Wu, **Jingjie Li**, Zhewen Pan, Younghyun Kim, Joshua San Miguel. **A Unary Brain Computer Interface**. International Symposium on Computer Architecture (ISCA), 2022. (Acceptance Rate: 16%)

Di Wu, **Jingjie Li**, Hsuan Hsiao, Younghyun Kim, Joshua San Miguel. **uGEMM: Unary Computing for GEMM Applications**. IEEE Micro (Special Issue on IEEE Micro Top Picks), 2021.

Di Wu, **Jingjie Li**, Setareh Behroozi, Younghyun Kim, Joshua San Miguel. **UNO: Virtualizing and Unifying Nonlinear Operations for Emerging Neural Networks**. ACM/IEEE ISLPED (International Symposium on Low Power Electronics and Design), 2021.

Di Wu, **Jingjie Li**, Hsuan Hsiao, Younghyun Kim, Joshua San Miguel. **uGEMM: Unary Computing Architecture for GEMM Applications**. ACM/IEEE ISCA (International Symposium on Computer Architecture), 2020. (Acceptance Rate: 18%)

- Hanwook Chung, **Jingjie Li**, Younghyun Kim, Jennifer M.C. Van Os, Sabrina H. Brounts, and Christopher Y. Choi. **Using Implantable Biosensors and Wearable Scanners to Monitor Dairy Cattle's Core Body Temperature in Real-Time.** Computers and Electronics in Agriculture, 2020.
- Younghyun Kim, Joshua San Miguel, Setareh Behroozi, Tianen Chen, Kyuin Lee, Yongwoo Lee, **Jingjie Li**, Di Wu. **Approximate Hardware Techniques for Energy-Quality Scaling Across the System.** ICEIC (International Conference on Electronics, Information, and Communication), 2020.
- Jackson Melchert, Setareh Behroozi, **Jingjie Li**, Younghyun Kim. **SAADI-EC: A Quality-Configurable Approximate Divider for Energy Efficiency.** IEEE TVLSI (Transactions on Very Large Scale Integration Systems), 2019.
- Setareh Behroozi, **Jingjie Li**, Jackson Melchert, Younghyun Kim. **SAADI: A Scalable Accuracy Approximate Divider for Dynamic Energy-Quality Scaling.** ASP-DAC (Asia South Pacific Design Automation Conference), 2019.
- Hanwook Chung, **Jingjie Li**, Younghyun Kim, Christopher Y. Choi. **Continuous and Wireless Skin Contact and Ear Implant Temperature Measurements and Relations to the Core Body Temperature of Heat Stressed Dairy Cows.** ASABE ILES (International Livestock Environment Symposium), 2018.

Invited Talks

- Nov 01, 2022. *Real-Time Privacy Control for Eye-Tracking Systems.* Invited by PrivacyCon @ **the US Federal Trade Commission.**
- Sept 07, 2022. *Usable Privacy Control for Real-Time Eye Tracking in AR/VR.* Invited by **Meta (formerly Facebook).**
- Aug 19, 2022. *Usable Privacy for Biometrics-Based Smart Devices.* Invited by Long Feng Science Forum @ **the Chinese University of Hong Kong, Shenzhen.**

Selected Research Projects

Understanding Smart Device Users' Security and Privacy Considerations via Online Media UW-Madison & UMich

- Leveraged online discussion forums (in particular Reddit) to study smart home users' attitudes on security and privacy through content analysis
- Analyzed the implications of smart home marketing materials regarding children's privacy, security, and safety

Usable Privacy Communication for Smart Device Users UW-Madison

- Designing communication interfaces for smart device users to facilitate privacy decision by machine learning and mixed reality
- Building natural language model for privacy document comprehension and user communication
- Leading a team of pre-law students in building up an annotated dataset of smart home companies' privacy documents

Human Factors in Hardware Reverse Engineering UW-Madison & MPI

- Studying the psychological factors and cognitive processes that contribute to hardware reverse engineering
- Conducted eye-tracking studies to understand human behaviors in hardware reverse engineering under a gamified setting

User Perception of Payment Authentication in Virtual Reality Visa Research

- Designed payment authentication interfaces and conducted user studies to understand users' security and privacy perception in a virtual reality game context

Privacy Enhancing Technologies for Augmented/Virtual Reality UW-Madison

- Contributing to Meta's award project on "Trustworthy Products in AR, VR, and Smart Devices"
- Designed Kaleido, a privacy-utility control knob to protect real-time eye gaze data by local differential privacy
- Implemented Kaleido as a Unity plugin and evaluated the user experience with an eye-tracking game

Balancing Usability, Security, and Privacy for Biometric Authentication UW-Madison

- Exploring biometric modalities to balance usability, security, and privacy of user authentication in various interactive contexts
- Designed Velody, a system that uses nonlinear vibration biometrics to generate cancelable authentication challenge-responses

Power-Efficient Design for Emerging Intelligent Systems UW-Madison

- Designing power-efficient systems for emerging computing and interactive applications such as brain-computer interfaces

Industrial Internet of Things in Precision Agriculture and Dairy Industry UW-Madison

- Developed power-efficient wearable/implantable sensing and communication systems to monitor dairy cattle's health

Automated Detection of Personality Traits Using Physiological Signals

ANU & CSIRO

- Researched on classifying users' personality traits using multiple physiological signals (eye gaze, EEG, skin conductance, etc.) during multi-media experience and driving simulation

Indoor Localization by Software Defined Radio (SDR)

ANU

- Designed a received signal strength-based indoor localization scheme that reduces the calibration effort on SDR platforms

Grant Application

Usable Privacy Control for Real-time Eye Tracking in AR/VR

AWARD: TOWARDS TRUSTWORTHY PRODUCTS IN AR, VR, AND SMART DEVICES (SPONSOR: META INC.)

- Principle Investigators: Kassem Fawaz and Younghyun Kim
- Grant amount: \$75,000.00 USD
- Responsibility: proposal writing and lead student contributor

Teaching & Mentoring Experience

- Fall 2022 **ECE 751 Embedded Computing Systems**, Guest Lecturer, UW-Madison
- Fall 2022 **CS 642 Introduction to Information Security**, Guest Lecturer, UW-Madison
- 2021-2022 **NSF Research Experiences for Undergraduates Program**, Research Mentor, UW-Madison
- 2021-2022 **ECE 399 Independent Study**, Research Mentor, UW-Madison
- 2020-2021 **Undergraduate Research Scholars Program**, Research Mentor, UW-Madison
- Spring 2019 **CS 354 Machine Organization and Programming**, Teaching Assistant, UW-Madison
- 2018 **Undergraduate Summer Research**, Research Mentor, UW-Madison

Professional Development

- 2022 **CDIS Workshop (NSF Funding: Why, What and How)**, UW-Madison, USA
- 2022 **CPS Rising Stars Workshop (Academic Career Development)**, University of Virginia, USA

Services

PEER REVIEW

- IEEE Transactions on Mobile Computing**, Reviewer
- IEEE Pervasive Computing**, Reviewer
- IEEE Transactions on Computers**, Reviewer
- USENIX Security Symposium**, External Reviewer
- IEEE Symposium on Security & Privacy**, External Reviewer
- ACM Conference on Computer and Communications Security**, External Reviewer
- Design Automation Conference**, External Reviewer
- Asia and South Pacific Design Automation Conference**, External Reviewer
- International Symposium on Low Power Electronics and Design**, External Reviewer
- Symposium on Applied Computing**, External Reviewer
- International Conference on VLSI Design**, External Reviewer

COMMUNITY SERVICE

- 2022-Present **Madison Tech Clinic**, Volunteer
 - Providing services to prevent technology abuse in intimate partner violence
- 2016-2017 **Robogals**, Volunteer
 - Organized educational events for Australian children to prompt diversity in STEM majors
- 2014-2015 **Student Union at School of Information and Electronics, BIT**, Director of Publicity
 - Designed publicity materials for student events

Media Coverage

Mar 04, 2022. *Understanding implications of augmented reality in manufacturing, privacy.* Covered by **the Badger Herald**.

Jan 04, 2022. *Come the Metaverse, Can Privacy Exist?* Covered by **the Wall Street Journal**.

Sept 23, 2021. *Announcing the winners of the 2021 Towards Trustworthy Products in AR, VR, and Smart Devices request for proposals.* Covered by **Meta Research**.

Apr 25, 2019. *Foxconn Announces Final Round Winners of “Smart Cities-Smart Futures” Competition.* Covered by **Urban Milwaukee**.

Dec 21, 2018. *“Smart City” awards recognize 14 UW-Madison students in first stage.* Covered by **UW-Madison News**.