

MCKENNA MCCALL

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RESEARCH INTERESTS

My research is at the intersection of formal methods and usable security. I am interested in building provably secure systems and ensuring these systems are usable, even by non-experts. My research spans several areas, from information flow control and programming languages to security and privacy for home IoT and confidential computing.

EDUCATION

Carnegie Mellon University, PhD in Electrical and Computer Engineering. Thesis: Information Flow Control for Dynamic Reactive Systems. Advised by Limin Jia. May 2023.

Carnegie Mellon University, MS in Electrical and Computer Engineering. December 2022.

Kansas State University, Bachelor of Science in Computer Science and Mathematics, Minor in Women's Studies. Graduated Magna Cum Laude. May 2016.

ACADEMIC WORK EXPERIENCE

Carnegie Mellon University, Post-doctoral Researcher in the Software and Societal Systems Department. Supervised by Lujó Bauer and Lorrie Cranor. May 2023-Present.

OTHER WORK EXPERIENCE

Garmin International, Software Engineering Intern (Aviation). September 2012- May 2016.

CONFERENCE PUBLICATIONS

McKenna McCall*, Ben Weinshel*, Kunlin Cai, Ying Li, Eric Zeng, Devika Manohar, Lujó Bauer, Limin Jia, and Yuan Tian. Location-Enhanced Information Flow Analysis for Smart Home Automations. (Under review at CCS '25).

McKenna McCall*, Carolina Carreira*, Miguel Flores, and Lorrie Cranor. "You do understand that people don't trust technology": Explaining Trusted Execution Environments. (Under review at IEEE S&P '25).

McKenna McCall, Abhishek Bichhawat, and Limin Jia. *Tainted Secure Multi-Execution to Restrict Attacker Influence*. In *Proceedings of the ACM Conference on Computer and Communications Security (CCS)*, 2023.

McKenna McCall, Eric Zeng, Faysal Hossain Shezan, Mitchell Yang, Lujo Bauer, Abhishek Bichhawat, Camille Cobb, Limin Jia, and Yuan Tian. *Towards Usable Security Analysis Tools for Trigger-Action Programming*. In *Proceedings of the USENIX Conference on Usable Privacy and Security (SOUPS)*, 2023.

McKenna McCall, Abhishek Bichhawat, and Limin Jia. *Compositional Information Flow Monitoring for Reactive Programs*. In *Proceedings of the IEEE European Symposium on Security and Privacy (Euro S&P)*, 2022.

Abhishek Bichhawat, McKenna McCall, and Limin Jia. *Gradual Security Types and Gradual Guarantees*. In *Proceedings of the 2021 IEEE Computer Security Foundations Symposium (CSF)*, 2021.

McKenna McCall, Hengruo Zhang, and Limin Jia. *Knowledge-based Security of Dynamic Secrets for Reactive Programs*. In *Proceedings of the 2018 IEEE Computer Security Foundations Symposium (CSF)*, 2018.

WORKSHOP PUBLICATIONS

McKenna McCall, Lay Kuan Loh, and Limin Jia. *A Sequent Calculus for Counterfactual Reasoning*. In *Proceedings of the 2017 ACM Workshop on Programming Languages and Analysis for Security (PLAS)*, 2017.

INVITED TALKS

Formal Methods or Usable Security: Why Not Both? In the Current Topics in Privacy Seminar at Carnegie Mellon University. Spring 2025.

Towards Usable Security Analysis Tools for Trigger-Action Programming. At CyLab's Partner's Conference. Fall 2023.

Formal Methods or Usable Security: Why Not Both? At the EPFL School of Computer and Communication Sciences Summer Research Institute. Summer 2024.

Formal Methods or Usable Security: Why Not Both? In the Department of Informatics and Networked Systems Seminar Series at the University of Pittsburgh. Spring 2024.

Towards Usable Security Analysis Tools for Trigger-Action Programming. At CyLab's Partner's Conference. Fall 2023.

POSTERS

Ben Weinshel, McKenna McCall, Kunlin Cai, Ying Li, Devika Manohar, Eric Zeng, Lujo Bauer, Limin Jia, and Yuan Tian. *Reactions to Information Flow Analysis of Smart-Home Automations*. CyLab Partners Conference. 2024.

Carolina Carreira, McKenna McCall, and Lorrie Faith Cranor. *How to Explain Trusted Execution Environments (TEEs)?* SOUPS 2024 poster session.

Carolina Carreira, Cody Berger, Khushi Shah, Samridhi Agarwal, Yashasvi Thakur, McKenna McCall, and Lorrie Faith Cranor. *Who's Listening? Analyzing Privacy Preferences in Multi-User Smart Personal Assistants Settings*. SOUPS 2024 poster session.

McKenna McCall, Eric Zeng, Faysal Hossain Shezan, Abhishek Bichhawat, Camille Cobb, Mitchell Yang, Limin Jia, Yuan Tian, and Lujo Bauer. *Security and Privacy of Trigger-Action Programs (TAP) for Smart Home Devices: Toward Usable Analysis Tools*. CyLab Partners Conference. 2022.

HONORS AND AWARDS

CMU Graduate Student Association Representative Award, Fall 2021, Spring 2023.

IEEE Euro S&P 2022 Outstanding Presentation Award for *Compositional Information Flow Monitoring for Reactive Programs*

Shadow PC Distinguished Reviewer, IEEE S&P Oakland, 2021.

CyLab Presidential Fellowship, Carnegie Mellon University, 2020.

Putnam Scholarship, Kansas State University, 2011-2014.

Travel Grants

Euro S&P 2022 Student Grant, 7th IEEE European Symposium on Security and Privacy (Euro S&P), Genoa, Italy, 2022.

FLoC 2018 Travel Stipend, 31st IEEE Computer Security Foundations Symposium (CSF), Oxford, UK, 2018.

ACM CCS 2017 Workshops Student Travel Grant, 24th ACM Conference on Computer and Communications Security (CCS), Dallas, TX, 2017.

CSF 2017 Travel Scholarship, 30th IEEE Computer Security Foundations Symposium (CSF), UCSB, Santa Barbara, CA, 2017.

PROFESSIONAL SERVICE

Invited to NSF Secure and Trustworthy Cyberspace Vision 2.0 Workshop, 2023

Conference Program Committees

PC member for USENIX Security Symposium (USENIX Security): 2025

PC member for IEEE Computer Security Foundations Symposium (CSF): 2025

External Reviewer for ACM Conference on Human Factors in Computing Systems (CHI): 2025

External Reviewer for IEEE Symposium on Security and Privacy (IEEE S&P, Oakland): 2023

PC member for IEEE Symposium on Security and Privacy (IEEE S&P, Oakland): 2022

External Reviewer for European Symposium on Security and Privacy (IEEE Euro S&P): 2022

External Reviewer for European Symposium on Programming (ESOP): 2022

Shadow PC for IEEE Symposium on Security and Privacy (IEEE S&P, Oakland): 2021

Workshop Program Committees

PC member for Workshop on Foundations of Computer Security (FCS): 2023-24

PC member for Principles of Secure Compilation Workshop (PriSC): 2023-24

Poster Committee at ACM Conference on Computer and Communications Security (CCS): 2022

UNIVERSITY AND DEPARTMENT SERVICE

CyLab Student Seminar Committee, Summer 2024-Spring 2025

CyLab's Justice, Equity, Diversity, and Inclusion Committee, Spring 2024-Spring 2025

Ombudsperson for Research Experience for Undergraduates Program, Summer 2024

Research Experience for Undergraduates Admissions Committee, Spring 2024

Universal Access Committee and Facilities Working Group, Spring 2022-Spring 2023

- Provided feedback on infrastructure planning for graduate students (including wellness vending machines) and families (including changing tables and mobile lactation rooms)

Dining Student Advisory Council, Spring 2022-Spring 2023

CyLab Mentor, Fall 2022

CIO Advisory Council, Summer 2022-Fall 2022

PhD Student Panel at Graduate Student Orientation, Fall 2022

CMU Graduate Student Assembly (GSA) VP of Campus Affairs, Spring 2022

- Led advocacy efforts related to campus resources for grad students, managed GSA's partner and family advocates and led child care grant efforts

Parking & Transportation Advisory Committee, Spring 2022

Led Chief of CMU PD Student Panel, Spring 2022

CMU Student Academic Success Center Executive Director Hiring Committee, Spring 2022

CMU Graduate Student Assembly Partner and Family Advocate, Spring 2021-Fall 2021

- Advocated for issues related to students with partners and families (priorities including developing a parental leave policy, improving access to child care during the pandemic)

Family Care Advisory Committee, Spring 2021-Summer 2021

Partner and Family Panel at Graduate Student Orientation, Spring 2019, Spring 2021

ECE Diversity Committee, Spring 2021

TEACHING EXPERIENCE

Future Faculty Program in CMU's Eberly Center for Teaching Excellence and Educational Innovation. Completed Fall 2024.

Guest Lecture on Information Flow Control, Software Foundations of Security and Privacy, Carnegie Mellon University. Fall 2023

Teaching Assistant, Introduction to Information Security, Carnegie Mellon University. Fall 2021

Teaching Assistant, Introduction to Information Security, Carnegie Mellon University. Fall 2017

Undergraduate Teaching Assistant, Introduction to Computer Science, Kansas State University. Fall 2015