He (Shawn) Shuang

PHD · WEB SECURITY · MACHINE LEARNING

+1 416 823 0889 | 8759shuang@gmail.com | 8759s.github.io | Citizenship: Canada

Education

University of Toronto *Toronto, ON Canada*
PHD, WEB SECURITY *2020 - Mar 2025*
- Advisor: Dr. David Lie
- Dissertation: On the Security and Privacy of Web Request

University of Toronto *Toronto, ON Canada*
MASC, WEB SECURITY *2017 - 2020*
- Advisor: Dr. David Lie
- Dissertation: Using Context to Verify Human Intent

University of Toronto *Toronto, ON Canada*
HONOURS BACHELOR OF SCIENCE (HBSC), COMPUTER SCIENCE *2011 - 2016*
- High distinction
- Focus on Web and Internet technologies

Professional Experience

Researcher *Toronto, ON Canada*
HUAWEI RESEARCH CANADA *2024 - Present*
- Developed LLMs-based vulnerability early detection framework reducing vulnerability acknowledgment time by 75%
- Developed Multi-agent-based vulnerability patcher reducing mean time to patch (MTTP) by 70%

Research Assistant for Prof Harald Bathelt *Toronto, ON Canada*
UNIVERSITY OF TORONTO *2020-2024*
Developed various statistical models in R to analyze ORBIS firm dataset

Teaching Assistant *Toronto, ON Canada*
UNIVERSITY OF TORONTO *2014-2024*
Taught undergraduate (roughly 200 students) and graduate (roughly 20 students) courses

Research Assistant for Prof Mariano Consens *Toronto, ON Canada*
UNIVERSITY OF TORONTO *2016-2017*
Building scalable string suffix sorting algorithm in Scala

Software Developer *Toronto, ON Canada*
TRAPEZE GROUP *2016-2017*
Full-stack software development in C++ and JavaScript

Software Developer Intern *Toronto, ON Canada*
TRAPEZE GROUP *2014-2015*
Full-stack software development in C++ and JavaScript

Publications

7. **He Shuang**, Lianying Zhao, and David Lie. 2025. Duumviri: Detecting Trackers and Mixed Trackers with a Breakage Detector. In The Network and Distributed System Security Symposium (NDSS).

6. Lianying Zhao, **He Shuang**, Shengjie Xu, Wei Huang, Rongzhen Cui, Pushkar Bettadpur, and David Lie. 2024. A Survey of Hardware Improvements to Secure Program Execution. ACM Computing Surveys (2024).

5. **He Shuang**, Lianying Zhao, and David Lie. 2023. vWitness: Certifying Web Page Interactions with Computer Vision. In 2023 53rd Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN), IEEE, 431–444.

4. **He Shuang**. 2020. Using Context to Verify Human Intent. University of Toronto (Canada).

3. **He Shuang**, Wei Huang, Pushkar Bettadpur, Lianying Zhao, Ivan Pustogarov, and David Lie. 2019. Using inputs and context to verify user intentions in internet services. In Proceedings of the 10th ACM SIGOPS Asia-Pacific Workshop on Systems, 76–83.

2. Lianying Zhao, **He Shuang**, Shengjie Xu, Wei Huang, Rongzhen Cui, Pushkar Bettadpur, and David Lie. 2019. Sok: Hardware security support for trustworthy execution. arXiv preprint arXiv:1910.04957 (2019).

1. Wei Huang, Vasily Rudchenko, **He Shuang**, Zhen Huang, and David Lie. 2018. Pearl-TEE: supporting untrusted applications in trustzone. In Proceedings of the 3rd Workshop on System Software for Trusted Execution, 8–13.

Awards, Fellowships, & Grants

2024, 2025	**Doctoral Completion Awards**, University of Toronto
2018, 2020, 2023	**Ontario Graduate Scholarship**, University of Toronto
2019, 2021, 2022	**Bell Graduate Scholarship**, University of Toronto
2017	**Graduate Research Fellowship**, University of Toronto
2011, 2012, 2013, 2015	**Dean's List Scholar**, University of Toronto
2011	**In-course Scholarship**, University of Toronto

Community and Media Recognition

Invited Talks

2025. *Duumviri: Detecting Trackers and Mixed Trackers with a Breakage Detector*. Oral presentation at NDSS 2025 in San Diego, US.

2023. *vWitness: Certifying Web Page Interactions with Computer Vision*. Oral presentation at DSN 2023 in Porto, Portugal.

2019. *Using inputs and context to verify user intentions in internet services*. Oral presentation at ApSys 2019 in Hangzhou, China.

Teaching Experience

Experiences include:

- Course design: labs, exam questions, course content
- Course delivery: class, labs, office hours
- Marking: labs, assignments, quizzes and exams

Fall 2020, Fall 2021, Spring 2022, Fall 2022, Fall 2023, Spring 2024	**ECE568: Computer Security, 100 students**, Teaching Assistant	*Toronto*
Fall 2020, Fall 2021, Fall 2022, Spring 2024	**ECE1776: Computer Security, Cryptography and Privacy, 20 students**, Teaching Assistant	*Toronto*
Fall 2018, Spring 2019, Fall 2019, Spring 2020	**ECE344: Operating Systems, 100 students**, Teaching Assistant	*Toronto*
Fall 2012, Spring 2013, Fall 2013, Spring 2014	**CSC108: Introduction to Computer Programming, 200 students**, Teaching Assistant	*Toronto*

Mentoring

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Tianchen Zhang's Undergraduate Project
Toronto, ON Canada

UNIVERSITY OF TORONTO
Summer 2022

- Developed a user interaction record-and-replay system for web security
- Project led to the Tianchen's admission to graduate school

Outreach & Professional Development

SERVICE AND OUTREACH

2019   **ACM Symposium on Operating Systems Principles (SOSP) 2019**, Volunteer
Huntsville, ON Canada

2018   **ACM Computer and Communications Security (CCS) 2018**, Volunteer
Toronto, ON Canada

PROFESSIONAL MEMBERSHIPS

- Association for Computing Machinery (ACM)

- Institute of Electrical and Electronics Engineers (IEEE)

Work Eligibility

Citizenship: Canada

- Canada: legally allowed to work for any employer and able to obtain security clearance

- US: legally allowed to work for any employer without sponsorship