Anna Kornfeld Simpson

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Education

University of Washington (Seattle, WA)

- *PhD Student in Computer Science and Engineering* — 2014 - Present
  Masters Degree in Computer Science and Engineering — Received 2016

Princeton University (Princeton, NJ) — *Summa Cum Laude*

- *B.S.E Computer Science* — September 2010 - June 2014

Publications and Posters

- **Anna Kornfeld Simpson**, Franziska Roesner, Tadayoshi Kohno. "Securing Vulnerable Home IoT Devices with an In-Hub Security Manager." *Proceedings of IEEE PerCom 2017 - the First International Workshop on Pervasive Smart Living Spaces (PerLS 2017).* March 2017.

- **Anna Kornfeld Simpson**, Shwetak N. Patel, Franziska Roesner, Tadayoshi Kohno. "Securing Vulnerable Home IoT Devices with an In-Hub Security Manager." *University of Washington Tech Report*, UW-CSE-17-01-01, 2017.

- Adam Lerner*, **Anna Kornfeld Simpson***, Tadayoshi Kohno, Franziksa Roesner. "Internet Jones and the Raiders of the Lost Trackers: An Archaeological Study of Web Tracking from 1996 to 2016." *Proceedings of the 25th USENIX Security Symposium (USENIX Security 16).* August 2016.
  Co-first-authors listed in alphabetical order.

- **Anna Kornfeld Simpson**, Nabil Schear, Thomas Moyer. "Runtime Integrity Measurement and Enforcement with Automated Whitelist Generation." Poster. *Annual Computer Security Applications Conference.* December 2014.

- Anne Edmundson, **Anna Kornfeld Simpson**, Joshua A. Kroll, Edward W. Felten. "Security Audit of Safeplug 'Tor-in-a-Box' ". *4th USENIX Workshop on Free and Open Communications on the Internet (FOCI 2014).* August 2014.

Awards and Honors

NSF Graduate Research Fellowship 2015
Lore von Jaskowsky Memorial Prize, Princeton School of Engineering and Applied Science . . . June 2014
Highest Honors (Summa Cum Laude), Princeton University Computer Science . . . . . June 2014
Departmental Service Award, Princeton University Computer Science . . . . . June 2014
Student Teaching Award, Princeton University Computer Science . . . . . June 2014
Winner, Google Anita Borg Memorial Scholarship (1 of 30 North American winners) . . . . . April 2013
Winner, Microsoft Scholarship . . . . . March 2013
Winner, Palantir Women in Technology Scholarship (1 of 2 winners out of 9 finalists) . . . . January 2013
Davidson Fellowship in Technology (1 of 20 fellows) . . . . . September 2010
Intel Science Talent Search Semifinalist . . . . . January 2010
Siemens Competition in Math, Science, & Technology Semifinalist . . . . . October 2009

Research Experience

- **University of Washington** — Research Assistantship
  Advisors: Professors Tadayoshi Kohno and Franziska Roesner — *2014 - Present*
  - My research focuses on building secure systems with security and privacy guarantees that match users' expectations.

- **Microsoft Research** Mobility and Networking Group
  Advisor: Dr. Stefan Saroiu *Summer 2016*
  - Designed and prototyped a tool for applications that use cloud services to discover how failures in those services would affect the application.
  - Used Roslyn .NET compiler to extract exceptions from cloud service client libraries.
  - Automatically converted extracted exception details to unit tests in an example app, fixing several bugs.
- **MIT Lincoln Laboratory** Cyber Systems and Technology
  Advisor: Dr. Nabil Schear *Summer 2014*
  - Research on cloud computing security techniques, taking ideas from trusted computing and information flow control to improve whitelisting and enforcement of software on a cloud system.
  - Process allows for attestation or enforcement of system integrity at runtime, an improvement of previous load-time-only integrity schemes.
  - Presented as a poster at Annual Computer Security Applications Conference (ACSAC) 2014.
- **Princeton University, Senior Thesis** Computer Science
  Advisor: Professor Edward Felten *May 2013 - January 2015*
  - Independent research on the design, implementation and evaluation of a history-independent file system.
  - Designed a system to preserve history independence on SSDs and other Flash memory that do not guarantee overwrites.
  - Guarantees to users that delete and other operations do what they say, even if someone steals their disk.
  - Spring 2014 Best Poster Award, Princeton Computer Science Department.
- **Princeton University, COS597G Final Research Project** Computer Science
  Advisor: Professor Edward Felten *December 2013 - August 2014*
  - Conducted, along with Anne Edmundson, a security audit of the Safeplug, a consumer device first sold in December 2013, investigating the security, privacy, usability and performance of the device.
  - We found several serious security issues which we reported to the manufacturer as well as some fundamental problems with the privacy provided by this type of device (browser HTTP proxy).
  - We presented the work the FOCI workshop associated with USENIX Security Conference in August 2014, as well as in a blog post on *Freedom to Tinker*.
  - Our work received coverage from the Tor Project, *Schneier on Security*, *WIRED*, and elsewhere.
- **Princeton University, Junior Independent Work** Computer Science
  Advisor: Professor Michael Freedman *December 2012 - May 2013*
  - Independent research on finite state machine generation to track control-flow dependencies among database queries.
  - Captured security policies in sample Django applications that were missed by a data-flow-only dependency model.
  - Improved policy prediction will increase website security and protect the privacy of users' data.
- **Princeton University, Independent Work** Computer Science
  Advisor: Professor Christopher Clark *Spring 2012*
  - Researched feature extraction from noisy sonar data for an autonomous underwater robot.
  - Wrote C++ software to produce accurate wall location from this data for wall-following control system.
  - Created maps of historical cisterns on the island of Malta as part of field testing.
- Previous research experience at Space and Naval Warfare Systems Center, Pacific (summer 2010); Massachusetts Institute of Technology (summer 2009); University of California San Diego (2007 - 2009).

Work Experience

- **Princeton University** Lab Teaching Assistant
  Computer Science Department *2012 - 2014*
  - One of 3 undergraduate TAs for Computer Networks Course; assisted with project specifications and helped students to debug code (Spring 2014).
  - One of 4 undergraduate TAs for Operating Systems Course; assisted with project specifications and helped students to debug code (Fall 2013).
  - Assisted students in 4 introductory computer science courses with debugging code. (2012 - 2014)
  - Coordinated LabTA wiki project to streamline problem solving and orienting new TAs.

- **Princeton University** Computer Science Tutor
  Peer Tutoring Program *2011 - 2014*
  - Assisted students in the residential colleges in the 3 introductory computer science courses for majors
  - Instructed on course material, conceptual questions, and lab assignments.
- **Princeton University** Grader
  Computer Science Department *Spring 2012, Spring 2013, Fall 2013*
  - Fall 2013: Grader for COS 432: Information Security. Graded assignments and provided written feedback to students on both coding and security design portions of assignments.
  - Spring 2012 and Spring 2013: Grader for COS 226: Algorithms and Data Structures. Graded weekly assignments and provided written feedback to students.
- **Microsoft (Redmond, WA)** Software Development Engineering Intern
  Windows Security and Identity Team *Summer 2013*
  - Developed verification code for the Windows 8.1 pseudo-random number generator system.
  - Project involved significant research into the workings of the system and learning about security of testing infrastructure.
  - Resulting verifications help to future-proof a complicated system and prevent dangerous and costly errors.
- **Microsoft** Software Development Engineering Intern
  Windows Sustained Engineering *Summer 2012*
  - Developed a security unit testing framework, currently being used by members of the testing team, for low-level Remote Desktop server code.
  - Investigated and fixed Windows 8 bugs in Remote Desktop.
  - Gained experience in C++ and C development, Windows 8, and Windows debugging.
- **Princeton University** Student Computing Consultant
  Office of Information Technology *Summer 2012*
  - Tested and wrote public documentation of Google Apps (including Gmail, Calendar, and Drive) for undergraduate use.
  - Documentation is live on the OIT Knowledgebase to help current and future students.
- **Qualcomm (San Diego, CA)** Intern
  Video Decoder Software Team *Summer 2011*
  - Optimized a portion of the h264 video decoder by converting from C to NEON assembly for the ARM processor.
  - Developed code that was more than twice as fast as the original.
  - Coordinated my team's presentation to engineers and managers to a division showcase.

Leadership and University Service

- **Center for Information Technology Policy**
  Undergraduate Fellows Forum Coordinator *2013-2014*
  - Since 2011, participated in CITP interdisciplinary reading groups on technology, society, and policy.
  - Encouraged undergraduate participation in CITP events, including reading groups and public lectures.
  - Organized twice-a-month lunch discussions or lectures on different technology policy issues.
  - Helped create an annual fall break trip to Washington, D.C. to see technology policy in practice.
- **Computer Science Undergraduate Council**
  One of 5 appointed members *2013-2014*
  - Appointed from members of the senior class to represent undergraduate interests to the faculty and create a supportive environment for undergraduates in the department.
  - Advocated for policy changes to the chair and other faculty, planned departmental social events including the 2013 senior dinner and 2014 winter holiday party, represented the department at recruitment and Majors Fair events, worked on welcome information for incoming majors.
- **Princeton University Wind Ensemble**
  Webmaster (2012-2013), Flute Section Leader (2011-2014) *2010-2014*
  - Maintained the Wind Ensemble website, updating concert and audition information each season.
  - Distributed parts and led special practices for flute players (about 15 musicians each semester).

- **Student Representative to University Trustees and Advisory Boards** *2013-2014*
  - Spoke about the Princeton undergraduate experience to meetings of the Princeton University Trustees (regarding residential college experience, June 2014), Engineering School Advisory Board (April 2014), Center for Information Technology Policy Advisory Board (April 2013) and Keller Center Advisory Board (regarding CITP certificate program, April 2013).
- **Women in Science Colloquium**
  Co-President (2012), Vice President (2011), Co-Founder (2010) *2010-2013*
  - Coordinated dinners to bring together female faculty in science, math, and engineering with interested undergraduate and graduate students for casual discussion, mentorship and inspiration.
  - Planned and coordinated 4-6 dinners a semester (ranging from 20-60 attendees), as well as a graduate school panel, industry events, and outreach to high school students in partnership with other organizations.
  - As the first Vice President, I ran the mailing list and RSVP process and raised awareness about the group by working with departments and residential colleges.
  - As Co-President, I helped to expand the group, building collaborations with other campus organizations, and making sure our dinners were sustainable.
  - Heard feedback from many students, particularly first-years, that our dinners helped them feel like they belonged in the STEM community on campus.
- **Princeton Women in Computer Science *PWiCS***
  Secretary (2011-2012), Tech Chair (2011), Board Member (2010) *2010-2014*
  - Added to and maintained the PWICS website, listserv and internal wiki.
  - Began regular collaboration with Women in Science Colloquium for faculty dinners.
  - Actively participated in mentorship, advising, recruitment, outreach and other group events.
- **Princeton Autonomous Vehicle Engineering**
  Outreach Chair (2011-2013) *2010-2013*
  - Started initiative (2012) to mentor an all-girls FIRST Tech Robotics team from local high school.
  - Coordinated semesterly presentation at the SWE high school colloquium.

Mentorship and Advising

- **Undergraduate Tutoring Program, University of Washington CSE Department** *2014-Present*
  Assisting undergraduates in computer science classes, including CSE 484 Security.
- **Mathey College and Engineering School** *2012 - 2014*
  Peer Academic Advisor
  - Assisted 20-30 first-year students with course selection in the fall and spring.
  - Provided advice about academic resources, internships, and navigating Princeton throughout the academic year, both by email and at monthly study breaks.
- **Princeton SWE and PWiCS Undergraduate Mentorship Programs** *2012-2014*
  Peer Mentor
  - Mentored small groups of younger female students annually, discussing courses, internships, and research involvement at monthly dinners.
  - Encouraged mentees to get involved in leadership of campus and departmental organizations, apply to scholarships or fellowships, and consider wide options after graduation.

Outreach

- **Poster at UW CSE Women's Research Day** *2014, 2016*
  Presented on my research and other Security Lab projects to undergraduate women in CSE.
- **Crytography Activity at UW CSE Open House** *2014-2015*
  Prepared cryptography puzzles and guided middle and high school students through solving them.
- **Presentation to High School Computer Science teachers** *2014*
  Presented on the "Security Mindset" to Puget Sound-area high school Computer Science teachers.

- **FIRST Lego League Robotics Team Mentorship** *2013-2014*
  Coached elementary and middle school Girl Scout team in their first experiences with robotics.
- **FIRST Tech Robotics Team Mentorship Program** *2012-2014*
  Founder and mentor
  - Founded and organized an ongoing mentorship program for a FIRST Tech Robotics team at a local all-girls' high school.
  - Recruited mentors from PWiCS and Princeton's robotics team to help the team with all aspects of the engineering process.
  - Served as a mentor in fall 2013 and fall 2014, when the team advanced to the state-level competition.
  - Several team members are now perusing engineering degrees in college.
- **Microsoft DigiGirlz Panelist** *2013*
  Spoke about computer science to a group of middle and high school girls from under-privileged areas.
- **Computer Science @ Princeton High School** *2012*
  Tutored high school students in introductory computer science.
- **Princeton Women in Computer Science** *Spring 2012*
  Presentations to middle and high school students about robotics and computer science.
- **Girl's Hat Day San Diego** *Summer 2011*
  Met twice-weekly with girls 6-18 to encourage learning and interest in engineering.

Professional Associations

- Member, Sigma Xi, research honor society, nominated by Princeton Computer Science Dept. *2014-Present*
- Member, USENIX Association *2014-Present*
- Member, IEEE and IEEE Computer Society *2014-Present*
- Member, Association for Computing Machinery (ACM) and ACM-W *2013-Present*
- Member, Systers, Anita Borg Institute *2012-Present*
- Member, National Society of Women Engineers (SWE) *2010-Present*