

MARCELA S. MELARA

<http://masomel.info>

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EDUCATION

Princeton University, Princeton, NJ

Doctor of Philosophy, Computer Science

September 2019

Thesis: "Intra-Process Least Privilege and Isolation for Emerging Applications"

Advisor: Michael J. Freedman

Master of Science in Engineering, Computer Science

June 2014

Thesis: "CONIKS: Preserving Secure Communication with Untrusted Identity Providers"

Advisors: Edward W. Felten, Michael J. Freedman

Hobart and William Smith Colleges (HWS), Geneva, NY

Bachelor of Science, summa cum laude, Computer Science

May 2012

Honors Thesis: "ELARA: Environmental Liaison and Automated Recycling Assistant", Advisor: John Vaughn.

Second Major in French and Francophone Studies. Minor in Physics.

RESEARCH INTERESTS

Computer Security, Operating Systems, Distributed Systems.

RESEARCH EXPERIENCE

Assistant in Research

Summer 2013, September 2014–September 2019

Princeton University

- Lead research on memory access control system for third-party code in trusted execution environments employed in cloud applications.
- Lead project on access control system for third-party code in high-level language IoT device applications.
- Lead research and development teams that design and build CONIKS, a practical key management system for end users that provides transparency and privacy.

Graduate Research Intern, Trusted Distributed Systems

June 2018–December 2018

Intel Labs

- Designed and implemented a novel memory access control system for trusted execution environments securing cloud applications using hardware-assisted techniques.

Summer Research Student

Summer 2010, Summer 2011

Hobart and William Smith Colleges

- Summer 2011: Designed a prototype software application for a networked recycling kiosk.
- Summer 2010: Implemented an educational processor with support for peripherals and an educational operating system using an FPGA.

SOFTWARE ENGINEERING EXPERIENCE

Main maintainer

April 2015–present

CONIKS System OSS

- Manage design, implementation, and evaluation of open-source Golang and Java CONIKS libraries and tools. Repositories: <https://github.com/coniks-sys>

OS Security Engineering Intern, CoreOS Team

June 2015–September 2015

Apple Inc.

- Evaluated deployment of CONIKS as part of a large-scale system.

OS Security Engineering Intern, CoreOS Team
Apple Inc.

June 2014–September 2014

- Improved sandboxing technology in core operating system.

Race Committee Technical Intern
Seneca7

November 2010–April 2011

- Designed and built a web-based program to track the runners of the Seneca7 running relay race in real-time.
- Managed and supported the tracking program on race day.

TEACHING EXPERIENCE

Graduate Teaching Fellow

Summer 2017–Spring 2019

Princeton University, McGraw Center for Teaching and Learning

- Provide instructional consultation for TAs via classroom observations.
- Lead the new Assistant in Instruction Orientation, a day-and-a-half training for new Computer Science TAs.

Assistant in Instruction

Princeton University

- COS 461: Computer Networks Spring 2014
Instructor: Prof. Michael Freedman
- COS 318: Operating Systems Fall 2013
Instructors: Prof. Kai Li, Dr. Andrew Bavier

Physics Teaching Fellow

Fall 2011–Spring 2012

Hobart and William Smith Colleges, Center for Teaching and Learning

- Held walk-in evening office hours for students taking Physics courses of any level.

Evening Teaching Assistant

Fall 2010–Spring 2011

Hobart and William Smith Colleges, Dept. of Mathematics and Computer Science

- Held walk-in evening office hours for students taking introductory Computer Science courses.

Teaching Assistant

Hobart and William Smith Colleges, Dept. of Mathematics and Computer Science

- CPSC 124: Introduction to Programming Spring 2012
Instructor: Prof. Carol Critchlow
- CPSC 124: Introduction to Programming Fall 2011
Instructor: Prof. David Eck
- MATH 131: Calculus II Fall 2009
Instructor: Prof. Kevin Mitchell

Undergraduate Students Mentored

- Jessica May, CRA-W Collaborative Research Experiences for Undergraduates Summer 2017
Project: “Stormship: Smart Tool for Revealing Malicious Scripts Hidden in Plain Sites”. Co-Mentor: Annie Edmundson, Advisor: Nick Feamster
- Huy Quoc Vu, Google Summer of Code Summer 2016
Project: “CONIKS for Tor Messenger”. Co-Mentor: Arlo Breault (The Tor Project)
- Michael Rochlin, Princeton University Spring 2015
Junior Independent Work: “Coniks 2.0: Publicly Verifiable Keystore with Key Changing and Verifying Capabilities”. Advisor: Ed Felten

PUBLICATIONS AND PRESENTATIONS

Marcela S. Melara, Michael J. Freedman, Mic Bowman. “EnclaveDom: Privilege Separation for Large-TCB Applications in Trusted Execution Environments”. *ArXiv Preprint*, July 2019.

Marcela S. Melara, David H. Liu, Michael J. Freedman. "Pyronia: Redesigning Least Privilege and Isolation for the Age of IoT". *ArXiv Preprint*, March 2019.

Marcela S. Melara. "Protecting the IoT Against Data Leaks through Intra-Process Access Control". *Student Presentation at National Security Institute Security and Privacy Day*, October 2017.

Marcela S. Melara. "Why Making Johnny's Key Management Transparent is So Challenging". *Post on Freedom To Tinker Blog*, March 2016.

Marcela S. Melara, Aaron Blankstein, Joseph Bonneau, Edward W. Felten, Michael J. Freedman. "CONIKS: Bringing Key Transparency to End Users". *USENIX Security Symposium*, August 2015.

Christian Eubank, **Marcela Melara**, Diego Perez Botero, Arvind Narayanan. "Shining the Floodlights on Mobile Web Tracking – A Privacy Survey". *IEEE Symposium on Security and Privacy Workshops, Web 2.0 Security and Privacy*, May 2013.

Marcela Melara. "Using FPGAs to Create a Complete Computer System for the Classroom". *Presentation at New York Celebration of Women in Computer Science*, April 2011.

Marc L. Corliss, **Marcela Melara**. "Vireos: an Integrated, Bottom-Up Educational Operating Systems Project with FPGA support". *ACM Technical Symposium on Computer Science Education*, March 2011.

HONORS AND AWARDS

Caspar Bowden Award for Outstanding Research in Privacy Enhancing Technologies	July 2017
Siebel Scholars Class of 2014	July 2013
Princeton University President's Fellowship	Fall 2012–Spring 2013
Student Travel Grants to SOSP 2013 and USENIX Security 2015	

UNDERGRADUATE HONORS AND AWARDS

Phi Beta Kappa	May 2012
Honors in Computer Science	April 2012
Dept. of Mathematics and Computer Science John S. Klein Prize	April 2012
Roderic '52 and Patricia '53 Ross Endowed Centennial Scholarship	Fall 2011–Spring 2012
Hai Timiai Women's Senior Honors Society	April 2011
Dept. of Mathematics and Computer Science William Ross Proctor Prize	April 2010
Phi Beta Kappa Book Award	April 2010
First Year Academic Achievement Award	April 2009
Dean's List	Fall 2008–Spring 2012

SERVICE AND EXTRACURRICULAR ACTIVITIES

Princeton FLIP Alliance student fellow	Fall 2018–Spring 2019
Princeton CS Research Inclusion Social Event	Fall 2017–Spring 2019
Princeton Computer Science Graduate Council	Spring 2016–Spring 2017
Princeton School of Engineering and Applied Sciences Recruiter, Grace Hopper Conference	October 2015
Siebel Scholars Regional Lead	Fall 2014–Spring 2016
Princeton Women in Computer Science	Fall 2013–Spring 2016

Women's Black Belt competitor, Princeton Taekwondo Team	Fall 2012–Spring 2014
HWS The Pitch Entrepreneurial Contest Finalist	February 2012
HWS Dept. of Physics Faculty Hiring Committee	Spring 2012
HWS Dept. of French and Francophone Studies Faculty Hiring Committee	Spring 2012
Association for Computing Machinery	June 2010–present
Games4Girls Computer Game Design Competition, Honorable Mention	April 2010
External Reviewer for WWW Conference 2015 and PoPETS 2018, 2019	

RELEVANT SKILLS

Programming Languages:

- Proficient: C, Python, Java
- Familiar: C++, Golang, C#, OCaml, Javascript, MySQL, PHP, Verilog

Operating Systems: Ubuntu Linux, OS X, iOS, Windows

Relevant Graduate Courses: Information Security, Advanced Computer Networks, Privacy Technologies, Advanced Computer Systems, Analytics and Systems of Big Data, Surveillance and Countermeasures

Natural Languages: English (native), Spanish (native), German (native proficiency), French (conversational)