

Talia Lily Ringer

<http://tlringer.github.io/>

EDUCATION

University of Washington

2015 – Present

Ph.D. in Computer Science

M.S. in Computer Science

2017

Advisor: Dan Grossman

Programming Languages & Software Engineering

University of Maryland, College Park

2008 – 2012

B.S. in Mathematics and Computer Science

Advisor: Lawrence Washington

Honors Thesis: [An Elliptic Curve Threshold Key Establishment Scheme](#)

PUBLICATIONS

Talia Ringer, Alex Sanchez-Stern, Dan Grossman, and Sorin Lerner.

[REPLICA: REPL Analysis for Coq Instrumentation.](#)

CPP 2020. [Talk video.](#)

Talia Ringer, Karl Palmskog, Ilya Sergey, Milos Gligoric, and Zachary Tatlock.

[QED at Large: A Survey of Engineering of Formally Verified Software.](#)

Foundations and Trends® in Programming Languages: Vol. 5: No. 2-3, pp 102-281. 2019.

[Project website.](#)

Talia Ringer, Nathaniel Yazdani, John Leo, and Dan Grossman.

[Ornaments for Proof Reuse in Coq.](#)

ITP 2019. [Talk video](#), DEVOID [tool repository](#).

Talia Ringer, Nathaniel Yazdani, John Leo, and Dan Grossman.

[Adapting Proof Automation to Adapt Proofs.](#)

CPP 2018. [Talk video](#), PUMPKIN PATCH [tool repository](#).

Talia Ringer, Dan Grossman, Daniel Schwartz-Narbonne, and Serdar Tasiran.

[A Solver-Aided Language for Test Input Generation.](#)

OOPSLA 2017. [Talk Video.](#)

Talia Ringer, Dan Grossman, and Franziska Roesner.

[AUDACIOUS: User-Driven Access Control with Unmodified Operating Systems.](#)

CCS 2016. [Talk Video.](#)

RESEARCH VISION

My main interest is in making program **verification** using interactive theorem provers more accessible through better **proof engineering** tools and practices, especially when it comes to *maintaining* proofs as programs change over time. My research extends traditional **proof**

automation to view proofs as fluid entities that change over time. My vision is a future of verification with the help of these tools that is accessible to all programmers, not just to experts. I believe that this will help make software more reliable and secure.

CURRENT RESEARCH

Proof Refactoring & Repair for Proof Engineers

I am partnering with [Galois](#) to integrate the [PUMPKIN PATCH](#) proof repair suite into the workflow of proof engineers. As part of this, I am extending PUMPKIN PATCH with new features, like automatic proof-carrying refactoring of programs, specifications, and proofs. We are using these features to help a proof engineer verify a TLS Handshake implementation.

STUDENTS ADVISED

Taylor Blau.
Verifying Strong Eventual Consistency in δ -CRDTs.
Senior Thesis. Work in Progress.

Jasper Hugunin (now at CMU).
[Constructing Inductive-Inductive Types in Cubical Type Theory](#).
FOSSACS 2019.

HONORS & AWARDS

P.E.O. Scholar
NSF GRFP Fellow
Graduated with Honors in Computer Science
Graduation Speech Finalist
Corporate Scholar
Scholar Athlete

University of Washington
University of Washington
University of Maryland
University of Maryland
University of Maryland
University of Maryland

MENTORSHIP, DIVERSITY, & OUTREACH

UW CSE Care Committee *2019 – Present*
Lead organizer of a support network for graduate students in times of need.

Jewish Family Services *2017 – Present*
ESL tutor and friendly visitor for an elderly refugee.

UW CSE *2015 – Present*
Mentor for undergraduate women and graduate students in computer science.

UW QMP *2016 – 2019*
Mentor for LGBT students from any major.

The Identity Function *2016 – 2018*
Author of a [blog interview series](#) about LGBT computer science researchers.

TUNE House 2015 – 2016
Mentor for undergraduate women in computer science.

Amazon 2012 – 2015
Technical and career mentor for software engineers.

SERVICE

ICFP Programming Languages Mentoring Workshop (PLMW) Co-Chair 2020
POPLmark 15 Year Retrospective Panel Lead Organizer 2020
CAV Artifact Evaluation Committee 2019
CoqPL Program Committee 2019
POPL Artifact Evaluation Committee 2018, 2019
ITP Sub-Reviewer 2018
University of Washington Graduate Admissions Committee 2018
DeepSpec Summer School Student Talks Organizer 2017

INVITED TALKS

Proof Transformation Spring 2020
[Logic Supergroup](#) Seminar Series

Proof Engineering Tools for a New Era Fall 2019
Rising Stars in CS Lecture Series at UMass Amherst

INVITED SEMINARS AND WORKSHOPS

Dagstuhl Seminar Delayed (COVID-19)
Static Methods for Correctness of Model and Program Transformations

Coq Users and Developers Workshop Summer 2018, 2019
An Event for Understanding, Improving, and Extending Coq

Rising Stars Fall 2019
An Academic Career Workshop for Women in EECS

TEACHING

University of Washington Fall 2018
Teaching Assistant for Concepts of Programming Languages

University of Washington Winter 2016
Teaching Assistant for Compilers

University of Maryland, College Park Spring 2012
Teaching Assistant for Computer and Network Security

University of Maryland, College Park 2010
Mathematics and Computer Science Tutor for Student-Athletes

INDUSTRY

Amazon

Summer 2016

Research Scientist Intern

Worked with the Automated Reasoning Group on automatic test generation. Developed a solver-aided domain-specific language to generate test inputs.

Amazon

2012 – 2015

Software Development Engineer

Worked with a team to develop the AmazonSupply website. Wrote and deployed code used company-wide and loaded hundreds of thousands of times per day. Developed a data flow analysis tool. Launched Amazon Business.

Amazon

Summer 2011

Software Development Engineer Intern

Developed an internal web application to generate metadata for the AmazonSupply website in a safe and user-friendly manner. Enabled version control and staging for the metadata.

Carr Astronautics

2010 – 2011

Corporate Scholars Program – Software Intern

Assisted in the development of a parallel image mosaicing application. Wrote code in C, MATLAB, and Java to read, alter, and write TIFF images with associated geographic data. Awarded a scholarship through the University of Maryland's Corporate Scholars Program.

INTERESTS

Other academic interests of mine include **domain-specific languages, program analysis, type systems, category theory, algebra, computer security, and cryptology**.

I enjoy writing **Coq plugins** and have implemented several tutorial plugins to help other plugin developers. I am a contributor to the Coq proof assistant. I have also [extended](#) Rosette to handle strings.

My favorite programming languages are **Coq, OCaml, and Rosette**.

I compete for **Club Northwest**, a top distance running club. I served on the board of Club Northwest from 2015 to 2016. My role was to promote our top runners through social media and writing. I ran **NCAA Division I Cross-Country** in 2009.

I also enjoy **solving logic and number puzzles, writing poetry, singing, studying Russian, making bagels, foraging edible mushrooms, and composing music for the piano**.