

# 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  $\delta$ -CRDTs.  
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

**Melbourne Logic Seminar** Spring 2020  
Logic Group at The University of Melbourne

**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**.