

# Talia Lily Ringer

<https://dependtyp.es>

## EDUCATION

### University of Washington

Ph.D. in Computer Science

M.S. in Computer Science

Advisor: Dan Grossman

2015 – Present

Spring 2021, expected

2017

### University of Maryland, College Park

B.S. in Mathematics and Computer Science

Advisor: Lawrence Washington

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

2008 – 2012

## PUBLICATIONS

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

[Proof Repair Across Type Equivalences.](#)

To Appear in PLDI 2021.

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

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

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 research makes **program verification** using interactive theorem provers more accessible through better **proof engineering** technologies, especially when it comes to *maintaining* proofs as programs change over time. To that end, I develop foundational results in **dependent type theory**, and use those results to drive the development of tools informed by the needs of real proof engineers. My vision is a future of verification with the help of these tools that is accessible to all programmers. I believe this will help make software more reliable and secure.

## UNDERGRADUATE STUDENTS ADVISED

Taylor Blau.  
[Verifying Strong Eventual Consistency in  \$\delta\$ -CRDTs](#).  
Senior Thesis.

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

## INDUSTRY

**Research Scientist Intern at Amazon (Automated Reasoning Group)** *Summer 2016*  
Developed a solver-aided domain-specific language to generate test inputs.

**Software Development Engineer at Amazon (Amazon Business)** *2012 – 2015*  
Wrote code used company-wide & loaded hundreds of thousands of times per day.

## HONORS & AWARDS

<b>College of Engineering Quarterly Fellow</b>	<i>University of Washington</i>
<b>P.E.O. Scholar</b>	<i>University of Washington</i>
<b>NSF GRFP Fellow</b>	<i>University of Washington</i>
<b>Graduated with Honors in Computer Science</b>	<i>University of Maryland</i>
<b>Graduation Speech Finalist</b>	<i>University of Maryland</i>
<b>Corporate Scholar</b>	<i>University of Maryland</i>
<b>Scholar Athlete</b>	<i>University of Maryland</i>

## GRANTS AWARDED

**POLYMORPH: Promotion to Optimal Languages Yielding Modular Operator-driven Replacements and Programmatic Hooks.** Galois, Northeastern, University of Washington, University of Alabama, and Syracuse University. DARPA [V-SPILLS](#). \$11,342,650.

## SERVICE

<a href="#">SIGPLAN Long-Term Mentoring Committee</a> Founder & Chair	<i>2021</i>
CAV Program Committee	<i>2021</i>
Mathematical Structures in Computer Science Reviewer	<i>2020</i>
Human Aspects of Types and Reasoning Assistants Program Committee	<i>2020</i>

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

## MENTORSHIP, DIVERSITY, & OUTREACH

<b>SIGPLAN Long-Term Mentoring Committee</b>	<i>2020 – Present</i>
Mentor for the mentorship program listed under service above.	
<b>Shut Down PL</b>	<i>2020</i>
Coorganizer of an anti-racist workshop for programming languages researchers.	
<b>Neighbors Feeding Neighbors Seattle &amp; Ballard Food Bank</b>	<i>2020 – Present</i>
Packer & delivery driver of food & masks for the hungry during the COVID-19 pandemic.	
<b>UW CSE Care Committee</b>	<i>2019 – Present</i>
Founder & organizer of a support network for graduate students in times of need.	
<b>Jewish Family Services</b>	<i>2017 – Present</i>
ESL tutor and friendly visitor for an elderly refugee.	
<b>UW CSE &amp; TUNE House</b>	<i>2015 – 2020</i>
Mentor for undergraduate women and graduate students in computer science.	
<b>UW QMP</b>	<i>2016 – 2019</i>
Mentor for LGBT students from any major.	
<b>The Identity Function</b>	<i>2016 – 2018</i>
Author of a <a href="#">blog interview series</a> about LGBT computer science researchers.	
<b>Amazon</b>	<i>2012 – 2015</i>
Technical and career mentor for software engineers.	

## INVITED TALKS

<b>Proof Engineering Tools for a New Era</b>	<i>Spring 2021</i>
Caltech, UCLA, UMass Amherst, Aarhus, Melbourne, Vermont	
<b>Proof Repair Across Type Equivalences</b>	<i>Fall 2020</i>
Cornell, CMU	

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

*Spring 2020*

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

*Fall 2019*

## INVITED SEMINARS AND WORKSHOPS

**Dagstuhl Seminar**  
Static Methods for Correctness of Model and Program Transformations

*Delayed (COVID-19)*

**Coq Users and Developers Workshop**  
An Event for Understanding, Improving, and Extending Coq

*Summer 2018, 2019*

**Rising Stars**  
An Academic Career Workshop for Women in EECS

*Fall 2019*

## TEACHING

**University of Washington**  
*Teaching Assistant for Concepts of Programming Languages*

*Fall 2018*

**University of Washington**  
*Teaching Assistant for Compilers*

*Winter 2016*

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

*Spring 2012*

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

*2010*

## INTERESTS

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

My favorite programming languages are **Coq**, **OCaml**, and **Rosette**. 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 [extended](#) Rosette to handle strings.

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**.