

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.](#)

Under Submission.

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 (now at Github).
[Verifying Strong Eventual Consistency in \$\delta\$ -CRDTs](#).
Senior Thesis.

Jasper Hugunin (now at CMU).
[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

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

GRANT SUBMISSIONS UNDER CONSIDERATION

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

SIGPLAN Long-Term Mentoring Committee 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>

ICFP Mentoring Chair	2020
ICFP Programming Languages Mentoring Workshop (PLMW) Co-Chair	2020
University of Washington Visit Days Panelist	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

MENTORSHIP, DIVERSITY, & OUTREACH

SIGPLAN Long-Term Mentoring Committee	2020 – Present
Mentor for the mentorship program listed under service above.	
Shut Down PL	2020
Coorganizer of an anti-racist workshop for programming languages researchers.	
Neighbors Feeding Neighbors Seattle & Ballard Food Bank	2020 – Present
Packer & delivery driver of food & masks for the hungry during the COVID-19 pandemic.	
UW CSE Care Committee	2019 – Present
Founder & 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 & TUNE House	2015 – 2020
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.	
Amazon	2012 – 2015
Technical and career mentor for software engineers.	

INVITED TALKS

Proof Engineering Tools for a New Era	Spring 2021
Caltech Frontiers in Computing and Mathematical Sciences	
Proof Repair Across Type Equivalences	Fall 2020
Cornell Programming Languages Discussion Group	
CMU Principles of Programming Seminar	

[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**.