

## Talia Lily Ringer

<https://dependtyp.es>

### ACADEMIA

#### University of Illinois at Urbana-Champaign

Assistant Professor

2021 – Present

#### University of Washington

Ph.D. in Computer Science

Advisor: Dan Grossman

Ph.D. Thesis: [Proof Repair](#). [Defense video](#).

2015 – 2021

#### 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](#).

PLDI 2021. PUMPKIN Pi [tool repository](#).

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 proof assistants more accessible through better **proof engineering** technologies that make it easier to develop and maintain verified systems. 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.

## 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*

Helped launch Amazon Business. Wrote code used company-wide.

## GRANTS AWARDED

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

## SERVICE

Coq Workshop Co-Chair	2022
ITP Program Committee	2022
PLDI Program Committee	2022
Illinois <a href="#">CS CARES</a> Committee	2021 – Present
SPLASH Hybridization Committee	2021
<a href="#">SIGPLAN Long-Term Mentoring Committee</a> (SIGPLAN-M) Founder & Chair	2021
CAV Program Committee	2021
Mathematical Structures in Computer Science Reviewer	2020
Human Aspects of Types and Reasoning Assistants Program Committee	2020
ICFP Mentoring Chair	2020
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
University of Washington Graduate Admissions Committee	2018
DeepSpec Summer School Student Talks Organizer	2017

## MENTORSHIP, DIVERSITY, & OUTREACH

<b>SIGPLAN Long-Term Mentoring Committee</b> Mentor for the mentorship program listed under service above.	<i>2020 – Present</i>
<b>Shut Down PL</b> Coorganizer of an anti-racist workshop for programming languages researchers.	<i>2020</i>
<b>Neighbors Feeding Neighbors Seattle &amp; Ballard Food Bank</b> Packer & delivery driver of food & masks for the hungry during the pandemic.	<i>2020 – 2021</i>
<b>UW CSE Care Committee</b> Founder & organizer of a support network for graduate students in times of need.	<i>2019 – 2021</i>
<b>Jewish Family Services</b> ESL tutor and friendly visitor for an elderly refugee.	<i>2017 – 2021</i>
<b>UW CSE &amp; TUNE House</b> Mentor for undergraduate women and graduate students in computer science.	<i>2015 – 2020</i>
<b>UW Queer Mentoring Program</b> Mentor for LGBT students from any major.	<i>2016 – 2019</i>
<b>The Identity Function</b> Author of a <a href="#">blog interview series</a> about LGBT computer science researchers.	<i>2016 – 2018</i>
<b>Amazon</b> Technical and career mentor for software engineers.	<i>2012 – 2015</i>

## INVITED TALKS

<b>Proof Engineering Tools for a New Era</b> Caltech, UCLA, UMass Amherst, Aarhus, Vermont, Illinois, Virginia, Tufts	<i>2021</i>
<b>Proof Repair Across Type Equivalences</b> Cornell, CMU	<i>2020</i>
<b><a href="#">Proof Transformation</a></b> <a href="#">Logic Supergroup</a> Seminar Series	<i>2020</i>
<b>Proof Engineering Tools for a New Era</b> Rising Stars in CS Lecture Series at UMass Amherst	<i>2019</i>

## INVITED SEMINARS AND WORKSHOPS

<b>Dagstuhl Seminar</b> Static Methods for Correctness of Model and Program Transformations	<i>Fall 2021</i>
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**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*

## **MEDIA**

### **How Will Proof Engineering Affect the Future of Software Development?**

A podcast interview about my work and future vision. From DevDiscuss Season 6, Episode 4.

### **Proof Repair & Code Generation**

A Galois blog post by Valentin Robert about using my tools for industrial applications.

### **Proof Engineering for the People**

A podcast interview about my work and future vision. From Building Better Systems.

### **AMA on Mentoring**

Invited Ask Me Anything (AMA) session at ICFP 2021 about SIGPLAN-M.

### **GAP Interview**

Interview about the academic job search.

## **HONORS & AWARDS**

**College of Engineering Quarterly Fellow**  
**P.E.O. Scholar**  
**NSF GRFP Fellow**

*University of Washington*  
*University of Washington*  
*University of Washington*

## **TEACHING**

### **University of Washington**

*TA for Concepts of Programming Languages (Fall 2018), Compilers (Winter 2016)*

### **University of Maryland, College Park**

*TA for Computer and Network Security (Spring 2012)*

## **JUST FOR FUN**

I enjoy **distance running**. I used to compete for **Club Northwest**, a top distance running club in Seattle. I served on the board of Club Northwest from 2015 to 2016. 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**.