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, Nathaniel Yazdani, John Leo, and Dan Grossman.
Adapting Proof Automation to Adapt Proofs.
CPP 2018. Talk video.

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 vision is a future of **verification** and **proof engineering** that makes interactive theorem provers accessible to any programmer. My research applies techniques from **programming by example**, **program evolution**, and **proof reuse** to a view of **proof automation** that considers how verification projects change over time.

CURRENT RESEARCH

Proof Patching
Talia Ringer, Nate Yazdani, John Leo, and Dan Grossman
Proof brittleness and difficulties using dependent types are major barriers to development in interactive theorem provers like Coq. We are working on proof automation that addresses these barriers. Our prototype tool PUMPKIN PATCH uses an example-based approach to address proof brittleness. We are extending it to automatically search for equivalences between types, then use the equivalences it finds to port functions and proofs between those types.

Proof Engineering
Talia Ringer, Karl Palmskog, Ilya Sergey, Milos Gligoric. and Zach Tatlock.
Proofs are ultimately software, and there is a growing body of work on proof engineering tools and techniques. We are working on a comprehensive survey paper to collect this work into one place and identify areas of need and future development.

STUDENTS ADVISED

Jasper Hugunin.
Constructing Inductive-Inductive Types in Cubical Type Theory.
To appear at FOSSACS 2019.

HONORS & AWARDS

NSF GRFP Fellow *University of Washington*
Graduated with Honors in Computer Science *University of Maryland*
Graduation Speech Finalist *University of Maryland*
Corporate Scholar *University of Maryland*
Scholar Athlete *University of Maryland*

MENTORSHIP, DIVERSITY, & OUTREACH

JFS *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 – Present*
Mentor for LGBT students from any major.

The Identity Function *2016 – Present*
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

CAV Artifact Evaluation Committee 2019
CoqPL Program Committee 2019
POPL Artifact Evaluation Committee 2018, 2019
University of Washington Graduate Admissions Committee 2018

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 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 **logic and number puzzles**, **chocolatiering**, **writing poetry**, **singing**, **studying Russian**, **making bagels**, and **composing music for the piano.**