

Alexa VanHattum

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Research Interests

Programming languages + systems, compilers, formal methods

Teaching Interests

Intro. CS, Intro. Systems, Programming Languages, Compilers, Software Engineering, Parallel Programming, Formal Methods Elective(s).

Appointments

July 2023–Present

Wellesley College | Assistant Professor, Computer Science

June–August 2022

Cornell University | Graduate Student Instructor, Computer Science

Education

2023

Cornell University | Ph.D., Computer Science

Thesis: *Lightweight Formal Methods for Correct, Efficient Systems Programming*

Advisor: Adrian Sampson

2021

Cornell University | M.S., Computer Science

2012–2016

Brown University | B.Sc., Computer Science

Publications

ASPLOS 2024

Conditionally accepted: *Lightweight, Modular Verification for WebAssembly-to-Native Instruction Selection*.

Alexa VanHattum, Monica Pardeshi, Chris Fallin, Adrian Sampson, Fraser Brown. International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2024).

ICSE SEIP 2022

Verifying Dynamic Trait Objects in Rust

Alexa VanHattum, Daniel Schwartz-Narbonne, Nathan Chong, and Adrian Sampson. International Conference on Software Engineering, Software Engineering in Practice track (ICSE SEIP 2022). [PDF](#). [DOI](#).

ASPLOS 2021

Vectorization for Digital Signal Processors via Equality Saturation.

Alexa VanHattum, Rachit Nigam, Vincent T. Lee, James Bornholt, Adrian Sampson. International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2021). [PDF](#). [DOI](#).

LCTES 2020

A Synthesis-aided Compiler for DSP Architectures (WiP Paper).

Alexa VanHattum*, Rachit Nigam*, Vincent T. Lee, James Bornholt, Adrian Sampson (*equal contribution). Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES 2020). [PDF](#). [DOI](#).

Selected Awards & Grants

- April 2020–Present **NSF Graduate Research Fellow 2020**
- April 2020 **Finalist: Qualcomm Innovation Fellowship 2020** with Rachit Nigam
- May 2019 **Outstanding Teaching Assistant** from Cornell CS, for Programming Languages & Logics
- April 2019 **Travel Scholarship** CRA-W Grad Cohort for Women Workshop

Teaching Experience: Instructor of Record

- Fall 2023 **CS240: Foundations of Computer Systems**, Wellesley College
- Summer 2022 **CS2110: Object-Oriented Programming and Data Structures**, Cornell University

Teaching Experience: Teaching Assistant

- Fall 2020 **Programming Languages & Logics**, Cornell University, Graduate TA
- Fall 2018 **Programming Languages & Logics**, Cornell University, Graduate TA
- Spring 2016 **Logic for Systems**, Brown University, Head TA
- Fall 2017 **Intro. Object-Oriented Programming**, Brown University, Head TA
- Spring 2015 **Discrete Structures & Probability**, Brown University, TA
- Fall 2014 **Intro. Object-Oriented Programming**, Brown University, TA
- Spring 2014 **First Byte of Computer Science**, Brown University, TA

Other Research Positions

- May–Dec 2021 **Amazon Web Services**, Automated Reasoning Applied Scientist Intern. Mentors: Daniel Schwartz-Narbonne, Nathan Chong
- Spring 2016 **Brown University**, Independent Study in Programming Languages. Advisor: Shriram Krishnamurthi
- Summer 2014 **The University of Toledo**, Physics NSF REU. Advisor: Jaques G. Amar

Prior Industry Positions

- 2016–2018 **Apple**, Health Software Engineer. Lead app/database engineer for Apple's FDA-regulated heart rhythm feature.
- Summer 2015 **Microsoft**, Software Engineering Intern

Invited Talks

- July 2023 **Career Chat and Technical Talk with Professor Alexa VanHattum** LLVM Women in Compilers and Tools Working Group
- April 2023 **Logic for Production Optimizing Compilers** Brown University

March 2023 **Verifying Instruction Selection in a Wasm-to-native Compiler** Dagstuhl Seminar, Foundations of WebAssembly

April 2022 **Verifying Dynamic Trait Objects in Rust** Brown University

April 2022 **Verifying Dynamic Trait Objects in Rust** University of Texas at Austin

December 2021 **Vectorization for DSPs via Equality Saturation** Wellesley College

April 2021 **Vectorization for DSPs via Equality Saturation** Brown University

April 2021 **Guest Lectures: Finite State Machines, Graph Theory** Contra Costa Community College

December 2020 **Vectorization for DSPs via Equality Saturation** University of California Santa Cruz

Service & Outreach

January 2023–Present **Volunteer Rematching Coordinator/Organizer** SIGPLAN-M Long Term Mentoring program

Mar–June 2023 **Student Research Competition at PLDI 2023** Judge/Review Committee (invited)

Mar–June 2023 **EGRAPHS Workshop at PLDI 2023** Program Committee (invited)

Aug 2019–June 2023 **Graduate Students for Gender Inclusion in Computing** Founding member, executive board

Mar–June 2022 **EGRAPHS Workshop at PLDI 2022** Program Committee (invited)

Summer 2020 **SPLASH OOPSLA 2020** Artifact Evaluation Committee

Aug 2020–Dec 2021 **Programming Languages Discussion Group** Co-organizer

Jan 2019–Dec 2021 **Cornell CS Colloquium** Student host organizer

Aug-Dec 2020 **CS Teaching Committee (re: COVID-19)** Student representative

June 2019 **PLDI 2019** Student volunteer

Spring 2019 **Cornell CS PhD Visit Day** Co-organizer

Spring 2019 **Cornell Girls' Adventures in Math** Student volunteer

2016–2017 **Apple Women in Science and Engineering Mentoring** Mentor