AMANDA LIU

lamanda@mit.edu
631•521•0180

16 Fiske Pl.
Cambridge MA, 02139

A. L.

EDUCATION

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Cambridge, MA
2020 – Present

DOCTOR OF PHILOSOPHY
EECS MERRILL LYNCH FELLOW

Electrical Engineering and Computer Science (EECS) department; advised by Prof. Jonathan Ragan-Kelley and Prof. Adam Chlipala; conducting research in formal methods, programming languages, and high-performance systems

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Cambridge, MA
2020 – 2022

MASTER OF SCIENCE
Electrical Engineering and Computer Science (EECS) department; advised by Prof. Jonathan Ragan-Kelley and Prof. Adam Chlipala; thesis on verified methods for optimizing high-performance tensor code in a high-level, algebraic way

COLUMBIA UNIVERSITY
New York, NY
2016 – 2020

BACHELOR OF SCIENCE
3.97 GPA (DEAN'S LIST, MAGNA CUM LAUDE)
Computer Science major (Software Systems) and Math minor; School of Engineering and Applied Sciences

RESEARCH EXPERIENCE

MICROSOFT RESEARCH
Remote
June 2022 – August 2022

Conducted research under Blake Pelton in collaboration with Nikhil Swamy, Chris Hawblitzel, Jay Lorch, and Tahina Ramananandro; explored automated formal methods for verifying parallel safety properties for a novel hardware description language

COLUMBIA UNIVERSITY
New York, NY
June 2019 –May 2020

Conducted research under Prof. Ronghui Gu on the DeepSEA blockchain language project; worked on language semantic design and specification as well as formal verification of the functional language to EVM bytecode compiler; implemented using OCaml and the Coq proof assistant

COLUMBIA UNIVERSITY
New York, NY
September 2018 – May 2019

Conducted research under Prof. Stephen Edwards on a project that compiles Haskell to System Verilog for FPGA specification; focused on leveraging Hindley-Milner type inference to perform type partitioning for memory storage level parallelization optimizations

CARNEGIE MELLON UNIVERSITY
Pittsburgh, PA
May – September 2018

Conducted research under Prof. Jonathan Aldrich on the capability-safe language Wyvern; wrote the architecture design language compiler for automated generation of secure, robust distributed systems

TEACHING EXPERIENCE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Cambridge, MA
January 2022 – May 2022

Teaching assistant for 6.822 (Formal Reasoning About Programs); a formal verification course providing a rigorous, mathematical foundation for analysis of realistic programs and systems taught in the Coq proof assistant; hosted several weekly office hours and graded and designed problem sets; gave a couple of lectures

COLUMBIA UNIVERSITY
New York, NY
September 2018–May 2020

Head teaching assistant for COMS 3157 (Advanced Programming); a systems programming course on C/C++ and Unix; held office hours, graded assignments, led review sessions, created instructional videos; maintained grading scripts; head TA and system administrator since Spring 2019

COLUMBIA UNIVERSITY
New York, NY
September 2019–May 2020

Head teaching assistant for COMS 4115 (Programming Languages and Translators); a compilers and programming languages course; advised groups on a large semester-long programming language design and compiler implementation project; head TA since Spring 2020

COLUMBIA UNIVERSITY
New York, NY
September –December 2019

Teaching assistant for COMS 6998 (Parallel Functional Programming); an introductory functional programming course focusing on Haskell and its parallelism features; wrote homework solutions; created a testing and grading homework submission scaffolding; held office hours

WORK EXPERIENCE

GOOGLE
Remote
June – August 2020

GOOGLE BRAIN INTERN
Developed and designed a new DSL in Haskell targeting an ISA specific to a novel hardware architecture; work was specific to the domain of ML inference accelerators and hardware design.

GOOGLE
Sunnyvale, CA
May – August 2019

SOFTWARE ENGINEER INTERN
Worked on the JavaScript Closure Compiler in Core Developer Web team; augmented the type system to support bounded parametric polymorphic generic types and annotations; implemented static analysis and syntax-directed optimization transformations.

PUBLICATIONS

POPL
2022

Verified Tensor-Program Optimization Via High-level Scheduling Rewrites

Amanda Liu, Gilbert Bernstein, Adam Chlipala, Jonathan Ragan-Kelley.

AWARDS AND HONORS

COLUMBIA UNIVERSITY

ANDREW P. KOSORESOW MEMORIAL AWARD FOR EXCELLENCE IN TEACHING AND SERVICE
2020
Awarded for outstanding contributions to teaching in the Department and exemplary service to the Department and its mission. Nominated based on evaluations by their supervising faculty and feedback from students in Courseworks or other forms.

NATIONAL SCIENCE FOUNDATION

GRADUATE RESEARCH FELLOWSHIP
2020
Awarded by the National Science Foundation funding five years of graduate studies to pursue research in the field of programming languages, formal methods, and programming systems.

MASSACHUSSETTS INSTITUTE OF TECHNOLOGY

MERRILL LYNCH FELLOWSHIP
2020
Awarded by the MIT EECS department faculty as part of as part of doctoral program admission offer.

COLUMBIA UNIVERSITY

TAU BETA PI
2018 – 2020
Engineering honor society with membership based on academic performance and serice; invited in junior year as a member of the top 8th of the class.

SPLASH CONFERENCE

STUDENT RESEARCH COMPETITION SEMIFINALIST

2018

Extended abstract reviewed and accepted as part of the undergraduate division of the student research competition; attended and presented a poster at the Systems, Programming, Languages, and Applications: Software for Humanity (SPLASH 2018).