

Education

- 2020 **Ph.D. Computer Science**
Advised by Sanjit A. Seshia
University of California, Berkeley
- 2018 **M.Sc. Computer Science**
Advised by Marsha Chechik
University of Toronto
- 2016 **B.Sc. Math and Computer Science**
First Class Honours with Distinction
Mount Allison University

Employment

- 2020, **Applied Scientist Intern, Amazon**
2021, AWS Automated Reasoning Group
2024 Supervised by Ankush Desai
- 2017 **Research Intern, General Motors**
Electronic Control Systems Lab
Supervised by Ramesh S

Research*

I am interested in automated reasoning, programming language theory, and formal methods. Specifically, I am excited about useful languages that theoretically and empirically lend themselves to efficient reasoning. All of my publications—which are listed below—relate to this theme.

Refereed Conference Papers[†]

- [1] Shah[†], **Mora**, and Seshia. “An Eager Satisfiability Modulo Theories Solver for Algebraic Datatypes”. *AAAI Conference on Artificial Intelligence (AAAI)*. 2024.
- [2] **Mora**, Desai, Polgreen, and Seshia. “Message Chains for Distributed System Verification”. *Proceedings of the ACM on Programming Languages (OOPSLA)*. 2023.
- [3] **Mora**, Berzish, Kulczynski, Nowotka, and Ganesh. “Z3str4: A Multi-armed String Solver”. *International Symposium on Formal Methods (FM)*. 2021.
- [4] Berzish, Day, Ganesh, Kulczynski, Manea, **Mora**, and Nowotka. “String Theories involving Regular Membership Predicates: From Practice to Theory and Back”. *International Conference on Words*. 2021.
- [5] Akhundov[†], **Mora**, Feng, Hui, and Chechik. “Verification by Gambling on Program Slices”. *International Symposium on Automated Technology for Verification and Analysis (ATVA)*. 2021.
- [6] Pimpalkhare[†], **Mora**, Polgreen, and Seshia. “MedleySolver: Online SMT Algorithm Selection”. *International Conference on Theory and Applications of Satisfiability Testing (SAT)*. 2021.
- [7] Berzish, Kulczynski, **Mora**, Manea, Day, Nowotka, and Ganesh. “An SMT Solver for Regular Expressions and Linear Arithmetic over String Length”. *International Conference on Computer-Aided Verification (CAV)*. 2021.
- [8] Feng, **Mora**, Hui, and Chechik. “Scaling Client-Specific Equivalence Checking via Impact Boundary Search”. *IEEE/ACM International Conference on Automated Software Engineering (ASE)*. 2020.
- [9] Scott, **Mora**, and Ganesh. “BanditFuzz: A Reinforcement-Learning Based Performance Fuzzer for SMT Solvers”. *Working Conference on Verified Software: Theories, Tools, and Experiments (VSTTE)*. 2020.
- [10] **Mora**, Li, Rubin, and Chechik. “Client-Specific Equivalence Checking”. *IEEE/ACM International Conference on Automated Software Engineering (ASE)*. 2018.

Refereed Journal Papers

- [11] Berzish, Day, Ganesh, Kulczynski, Manea, **Mora**, and Nowotka. “Towards more efficient methods for solving regular-expression heavy string constraints”. *Theoretical Computer Science* (2023).

*Awarded the Qualcomm Innovation Fellowship

[†]Denotes undergraduate research mentee

 Refereed Short or Tool Papers

- [12] Polgreen, Cheang, Gaddamadugu, Godbole, Laeuffer, Lin, Manerkar, **Mora**, and Seshia. “UCLID5: Multi-Modal Formal Modeling, Verification, and Synthesis”. *International Conference on Computer-Aided Verification (CAV)*. 2022.
- [13] Scott, Sudula, Rehman, **Mora**, and Ganesh. “BanditFuzz: Fuzzing SMT Solvers with Multi-Agent Reinforcement Learning”. *International Symposium on Formal Methods (FM)*. 2021.
- [14] Blotsky, **Mora**, Berzish, Zheng, Kabir, and Ganesh. “StringFuzz: A Fuzzer for String Solvers”. *International Conference on Computer-Aided Verification (CAV)*. 2018.

 Refereed Workshop Papers or Presentations

- [15] Li, **Mora**, Polgreen, and Seshia. “Genetic Algorithms for Searching a Matrix of Metagrammars for Synthesis”. *Workshop on Synthesis (SYNT)*. 2023.
- [16] **Mora**, Cheang, Polgreen, and Seshia. “Synthesis in UCLID5”. *Workshop on Synthesis (SYNT)*. 2020.

 Grant Writing Contributions

- 2021 **Amazon Research Award** (with Sanjit A. Seshia as PI)
 “Scalable Verification of Secure Distributed Services through Synthesis and Learning”

 Teaching and Mentoring[‡]

My teaching and mentoring is primarily influenced by universal design for learning (UDL) principles. I am particularly interested in how autograders can maximize student autonomy and encourage active learning. I have taught at the undergraduate and graduate levels and covered topics including programming languages, formal methods, software engineering, and artificial intelligence.

 Courses Taught

- 2022-24 **Guest Lectures, UC Berkeley**
 EECS 219C: Formal Methods: Specification, Verification, and Synthesis
 - Abstraction and Verification by Reduction to Synthesis
 - Interpolation-Based Model Checking and IC3
 - Satisfiability Modulo Theories - Part II: Theories and Theory Solvers
 - Syntax-Guided SynthesisCS 164: Programming Languages and Compilers
 - Regular Expressions and Tokenization
- 2021-22 **Graduate Student Instructor, UC Berkeley**
 CS 164: Programming Languages and Compilers (2)
- 2016-18 **Teaching Assistant, University of Toronto**
 CSC 324: Principles of Programming Languages
 CSC 384: Introduction to Artificial Intelligence (2)
 CSC 410: Software Testing and Verification (2)
- 2015-16 **Teaching Assistant, Mount Allison University**
 COMP 1631: Introduction to Computer Science

 Students Mentored

- 2020- **UC Berkeley Undergraduate Students**
 Amar Shah (PLDI '23 USRC Winner), Annamira O'Toole, Selina Kim, Nikhil Pimpalkhare (co-mentored with Elizabeth Polgreen)

[‡]Received UC Berkeley's Outstanding Graduate Student Peer Mentor and Teaching Assistant Awards

- 2023- **MiraCosta College Students**
Haley Lepe (NDiSTEM '23 Presentation Award Winner)
- 2022-23 **City College of San Francisco Students**
Isaac Chan (co-mentored with Lauren Pick)
- 2018-20 **University of Toronto Undergraduate Students**
Murad Akhundov (POPL '20 USRC Winner), Lukas Finnbar O'Callahan, Alex Tough

Service[§]

I prioritize service that promotes diversity, equity, and inclusion in computer science. Whether directly, like through application assistance, or indirectly, like through outreach at local schools.

Professional Service

Organizer

- Berkeley Programming Systems Seminar Series (Summer '20)

Artifact Evaluation Committee Member

- Tools and Algorithms for the Construction and Analysis of Systems (TACAS '23)

Reviewer

- Formal Methods in System Design (FMSD '22)

External Reviewer or Subreviewer

- Automated Software Engineering (ASE '17, '18, '19)
- Computer Aided Verification (CAV '18, '21)
- Formal Methods in Computer-Aided Design (FMCAD '21, '22)
- Foundations of Software Engineering (FSE '17)
- International Joint Conference on Automated Reasoning (IJCAR '18)
- Programming Language Design and Implementation (PLDI '21)
- Tools and Algorithms for the Construction and Analysis of Systems (TACAS '21, '24)
- Verification, Model Checking, and Abstract Interpretation (VMCAI '24)

Conference or Workshop Student Volunteer

- Programming Language Design and Implementation (PLDI '22)
- Bryant Discoveries Day (FLoC '22)
- Waterloo Machine Learning, Verification, and Security Workshop ('19)

UC Berkeley EECS Departmental Service

- CS Faculty Hiring Committee ('24)
- Equal Access to Application Assistance Reviewer ('23)
- Visit Day Coordinator ('21)
- CSGSA Social Chair ('19, '20)

[§]Received UC Berkeley's EECS Department Chair's Graduate Award

Community Outreach

- 2022 **Citizen Clinic**
Worked with indigenous land rights activists to help them defend themselves and their communities from cyber threats.
- 2022 **Be A Scientist**
Mentored a group of four seventh grade students in Spanish. Students designed and conducted their own scientific experiment over a six-week-long lab.
- 2020 **Bay Area Scientists in Schools (BASIS)**
Developed a new bilingual “You Belong” lesson on Ynés Mexía’s research. Lesson delivered to schools serving low-income and historically marginalized communities.

Awards and Distinctions[¶]

- 2024 Outstanding Graduate Student Peer Mentor Award (UC Berkeley)
- 2024 Demetri Angelakos Memorial Achievement Award (UC Berkeley EECS)
- 2023 Outstanding Teaching Assistant Award (UC Berkeley EECS)
- 2022 Outstanding Graduate Student Instructor Award (UC Berkeley)
- 2021 Qualcomm Innovation Fellowship
- 2021 Chair’s Graduate Award (UC Berkeley EECS)
- 2019 Department Fellowship (UC Berkeley EECS)
- 2018 C. C. Gotlieb (Kelly) Graduate Fellowship (University of Toronto CS)
- 2017 Alfred B. Lehman Graduate Scholarship (University of Toronto CS)

[¶]Excluding awards from undergraduate studies or earlier