

# Loris D'Antoni

## CURRICULUM VITAE

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### Education

- 2010–2015 **PhD, Computer Sciences**, *University of Pennsylvania*, Philadelphia.
- 2008–2010 **Master's of Computer Sciences**, *Università di Torino*, Turin, Italy.
- 2005–2008 **Bachelor's of Computer Sciences**, *Università di Torino*, Turin, Italy.

### Employment

- 2021–current **Associate Professor**, *University of Wisconsin*, Madison, WI.
- 2015–2021 **Assistant Professor**, *University of Wisconsin*, Madison, WI.
- August 2016 **Visiting Researcher**, *Microsoft Research*, Redmond, WA.
- Summer 2013 **Research Intern**, *Microsoft Research*, Redmond, WA.
- Summer 2012 **Research Intern**, *Microsoft Research*, Redmond, WA.

### Referred conference papers

Underlined Names: My students and me.

*Contribution*: Percentage of work contributed by my students and me .

- POPL 2023 **Unrealizability Logic**, Jinwoo Kim, Loris D'Antoni, Tom Reps 50th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, (28.0% acceptance rate), contribution 80% .
- NeurIPS 2022 **BagFlip: A Certified Defense against Data Poisoning**, Yuhao Zhang, Aws Albarghouthi, Loris D'Antoni Neural Information Processing, (25.7% acceptance rate), contribution 50% (Zhang is coadvised with Albarghouthi).
- FMCAD 2022 **Synthesizing Transducers from Complex Specifications**, Anvay Grover, Reudiger Ehlers Loris D'Antoni Formal Methods in Computer-Aided Design, (??% acceptance rate), contribution 95%.
- OOPSLA 2022 **Synthesizing Abstract Transformers**, Pankaj Kalita, Sujit Muduli, Loris D'Antoni, Thomas Reps, Subhajit Roy Proceedings of the ACM on Programming Languages, (31.3% acceptance rate), contribution 25% .
- PLDI 2022 **P4BID: Information Flow Control in P4**, Karuna Grewal, Loris D'Antoni, Justin Hsu 43rd ACM SIGPLAN Conference on Programming Language Design and Implementation, (20.8% acceptance rate), contribution 50% (co-advised Karuna Grewal remotely as an undergraduate student).
- NeurIPS 2021 **Certifying Robustness to Programmable Data Bias in Decision Trees**, Anna P. Meyer, Aws Albarghouthi, Loris D'Antoni, Thirty-fifth Conference on Neural Information Processing Systems, (26% acceptance rate), contribution 75%.

- EMNLP 2021 **Certified Robustness to Programmable Transformations in LSTMs**, Yuhao Zhang, Aws Albarghouthi, [Loris D'Antoni](#), The 2021 Conference on Empirical Methods in Natural Language Processing, (22.4% acceptance rate), selected for oral presentation, contribution 75%.
- SBES 2021 **Learning Quick Fixes from Code Repositories**, Reudismam Rolim, Gustavo Soares, Rohit Gheyi, Titus Barik, [Loris D'Antoni](#), The 2021 Conference on Empirical Methods in Natural Language Processing, (34% acceptance rate), Distinguished paper award, contribution 50%.
- SOSR 2021 **D2R: Dataplane-Only Policy-Compliant Routing Under Failures**, Kausik Subramanian, Anubhavnidhi Abhashkumar, [Loris D'Antoni](#), Aditya Akella, ACM SIGCOMM Symposium on SDN Research, (21% acceptance rate), contribution 70%.
- CAV 2021 **Synthesis with Asymptotic Resource Bounds**, Qinheping Hu, John Cyphert, [Loris D'Antoni](#), Tom Reps, 32nd international conference on Computer Aided Verification, online, 2021, (?% acceptance rate), contribution 85%.
- CAV 2021 **Programmable Program Synthesis**, Jinwoo Kim, Qinheping Hu, [Loris D'Antoni](#), Tom Reps, 32nd international conference on Computer Aided Verification, online, 2021, Invited keynote, contribution 85%.
- POPL 2021 **Semantics-Guided Synthesis**, Jinwoo Kim, Qinheping Hu, [Loris D'Antoni](#), Tom Reps, 48th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, (23% acceptance rate), contribution 85%.
- CAV 2020 **Automata Tutor v3**, [Loris D'Antoni](#), Martin Helfrich, Jan Kretinsky, Emanuel Ramniantu, Maximilian Weinger, 31st international conference on Computer Aided Verification, online, 2020, (27% acceptance rate), contribution 50%.
- ICML 2020 **Robustness to Programmable String Transformations via Augmented Abstract Training**, Yuhao Zhang, Aws Albarghouthi, [Loris D'Antoni](#), Thirty-seventh International Conference on Machine Learning, (21% acceptance rate), contribution 75%.
- PLDI 2020 **Detecting Network Load Violations for Distributed Control Planes**, Kausik Subramanian, Anubhavnidhi Abhashkumar, [Loris D'Antoni](#), Aditya Akella, 41st ACM SIGPLAN Conference on Programming Language Design and Implementation, London, UK, 2020 (22% acceptance rate), contribution 75%.
- PLDI 2020 **Proving Data-Poisoning Robustness in Decision Trees**, Samuel Drews, Aws Albarghouthi, [Loris D'Antoni](#), 41st ACM SIGPLAN Conference on Programming Language Design and Implementation, London, UK, 2020 (22% acceptance rate), SIGPLAN Research Highlight, CACM Research Highlight contribution 75%.
- PLDI 2020 **Exact and Approximate Methods for Proving Unrealizability of Syntax-Guided Synthesis Problems**, Qinheping Hu, John Cyphert, [Loris D'Antoni](#), Tom Reps, 41st ACM SIGPLAN Conference on Programming Language Design and Implementation, London, UK, 2020 (22% acceptance rate), contribution 75%.
- ESOP 2020 **Solving Program Sketches with Large Constants**, Rong Pan, Qinheping Hu, Rishabh Singh, [Loris D'Antoni](#), 29th European Symposium on Programming, Dublin, Ireland (31% acceptance rate), Best paper award nomination, contribution 100%.

- OOPSLA 2019 **Automatic Repair of Regular Expressions**, Rong Pan, Qinheping Hu, Gaowei Xu, Loris D'Antoni, 2019 ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications, Athens, Greece, 2019, (36% acceptance rate), contribution 100%.
- SAS 2019 **Direct Manipulation for Imperative Programs**, Qinheping Hu, Rishabh Singh, Roopsha Samanta, Loris D'Antoni, 26th Static Analysis Symposium, Porto, Portugal, 2019, (40% acceptance rate), contribution 100%.
- CAV 2019 **Efficient Synthesis with Probabilistic Constraints**, Samuel Drews, Aws Albarghouthi, Loris D'Antoni, 31st international conference on Computer Aided Verification, New York City, USA, 2019, (26% acceptance rate), contribution 75%.
- CAV 2019 **Symbolic Register Automata**, Loris D'Antoni, Tiago Ferreira, Matteo Sammartino, Alexandra Silva, 31st international conference on Computer Aided Verification, New York City, USA, 2019, (26% acceptance rate), contribution 50%.
- CAV 2019 **Proving Unrealizability for Syntax-Guided Synthesis**, Qinheping Hu, Jason Breck, John Cyphert, Loris D'Antoni, Tom Reps, 31st international conference on Computer Aided Verification, New York City, USA, 2019, (26% acceptance rate), contribution 80%.
- CAV 2018 **Syntax Guided Synthesis with Quantitative Syntactic Objectives**, Qinheping Hu, Loris D'Antoni, 30th international conference on Computer Aided Verification, Oxford, UK, 2018, (30% acceptance rate), contribution 100%.
- CAV 2018 **The Learnability of Symbolic Automata**, George Argyros, Loris D'Antoni, 30th international conference on Computer Aided Verification, Oxford, UK, 2018, (30% acceptance rate), contribution 50%.
- SIGMETRICS 2018 **Synthesis of Fault-Tolerant Distributed Router Configurations**, Kausik Subramanian, Loris D'Antoni, Aditya Akella, 2018 ACM SIGMETRICS International Conference on Measurement and Modeling of Computer Systems, Irvine, California, USA (14% acceptance rate), contribution 50%.
- VL/HCC 2017 **TraceDiff: Debugging Unexpected Code Behavior Using Trace Divergences**, Ryo Suzuki, Gustavo Soares, Andrew Head, Elena Glassman, Ruan Reis, Melina Mongiovi, Loris D'antoni, Bjoern Hartmann, 2017 AIEEE Symposium on Visual Languages and Human-Centric Computing, Raleigh, North Carolina, USA (29% acceptance rate), contribution 5%.
- OOPSLA 2017 **FairSquare: Probabilistic Verification of Program Fairness**, Aws Albarghouthi, Loris D'Antoni, Samuel Drews, Aditya Nori, 2016 ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications, Vancouver, Canada, (28% acceptance rate), contribution 75%.
- ESEC/FSE 2017 **NoFAQ: Synthesizing Command Repairs From Examples**, Loris D'Antoni, Rishabh Singh, Michael Vaughn, 11th Joint Meeting of the European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering, Paderborn, Germany, (24% acceptance rate), contribution 85%.
- MFPS XXIII **A Symbolic Decision Procedure for Symbolic Alternating Finite Automata**, Loris D'Antoni, Zachary Kincaid, Fang Wang, 33rd Conference on the Mathematical Foundations of Programming Semantics, Ljubljana, Slovenia, (50% acceptance rate), contribution 70%.

- IJCAI 2017 **Weighted Model Integration with Orthogonal Transformations**, [David Merrell](#), [Aws Albarghouthi](#), [Loris D'Antoni](#), 26th International Joint Conference on Artificial Intelligence, Melbourne, Australia, 2017, (25% acceptance rate), contribution 75%.
- CAV 2017 **The Power of Symbolic Automata and Transducers**, [Loris D'Antoni](#), [Margus Veanes](#), 29th international conference on Computer Aided Verification, Heidelberg, Germany, 2017, (invited contribution), contribution 75%.
- CAV 2017 **Repairing Decision-Making Programs under Uncertainty**, [Samuel Drews](#), [Aws Albarghouthi](#), [Loris D'Antoni](#), 29th international conference on Computer Aided Verification, Heidelberg, Germany, 2017, (33% acceptance rate), contribution 75%.
- PLDI 2017 **Automatic Program Inversion using Symbolic Transducers**, [Loris D'Antoni](#), [Qinheping Hu](#), 38th ACM SIGPLAN Conference on Programming Language Design and Implementation, Barcelona, Spain, 2017 (14.6% acceptance rate), contribution 100%.
- PLDI 2017 **Control-Flow Recovery from Partial Failure Reports**, [Peter Ohmann](#), [Alexander Brooks](#), [Loris D'Antoni](#), [Ben Liblit](#), 38th ACM SIGPLAN Conference on Programming Language Design and Implementation, Barcelona, Spain, 2017 (14.6% acceptance rate), contribution 20%.
- TACAS 2017 **Forward Bisimulations for Nondeterministic Symbolic Finite Automata**, [Loris D'Antoni](#), [Margus Veanes](#), 23rd International Conference on Tools and Algorithms for the Construction and Analysis of Systems, Uppsala, Sweden, 2017 (28.5% acceptance rate), contribution 65%.
- TACAS 2017 **Learning Symbolic Automata**, [Loris D'Antoni](#), [Samuel Drews](#), 23rd International Conference on Tools and Algorithms for the Construction and Analysis of Systems, Uppsala, Sweden, 2017 (28.5% acceptance rate), Best paper award nominee contribution 100%.
- L@S 2017 **Writing Reusable Code Feedback at Scale with Mixed-initiative Program Synthesis**, [Andrew Head](#), [Elena Glassman](#), [Gustavo Soares](#), [Ryo Suzuki](#), [Lucas Figueredo](#), [Loris D'Antoni](#), [Bjoern Hartmann](#), 4th Annual ACM Conference on Learning at Scale, Boston, USA, 2017 (13% acceptance rate), contribution 15%.
- ICSE 2017 **Learning Syntactic Program Transformations from Examples**, [Reudismam Rolim](#), [Gustavo Soares](#), [Loris D'Antoni](#), [Oleksandr Polozov](#), [Sumit Gulwani](#), [Rohit Gheyi](#), [Ryo Suzuki](#), [Bjoern Hartmann](#), 39th International Conference on Software Engineering, Buenos Aires, Argentina, 2017, (16% acceptance rate), contribution 30%.
- POPL 2017 **Monadic Second-order Logic on Finite Sequences**, [Loris D'Antoni](#), [Margus Veanes](#), 44th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, 232-245, Paris, France, 2017, (23% acceptance rate), contribution 60%.
- POPL 2017 **Genesis: Data Plane Synthesis in Multi-Tenant Networks**, [Kausik Subramanian](#), [Loris D'Antoni](#), [Aditya Akella](#), 44th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, 572-585, Paris, France, 2017, (23% acceptance rate), contribution 50%.
- MICRO-49 **HARE: Hardware Accelerator for Regular Expressions**, [Vaibhav Gogte](#), [Aasheesh Kolli](#), [Michael J. Caffarella](#), [Loris D'Antoni](#), [Thomas F. Wenish](#), 49th Annual IEEE/ACM International Symposium on Microarchitecture, 1-12, Taipei, Taiwan, 2016, (21% acceptance rate), contribution 25%.

- CAV 2016 **Qlose: Program Repair with Quantitative Objectives**, [Loris D'Antoni](#), Roopsha Samanta, Rishabh Singh, 28th international conference on Computer Aided Verification, 383-401, Toronto, Canada, 2016, (27% acceptance rate), contribution 35%.
- LICS 2016 **Minimization of Symbolic Tree Automata**, [Loris D'Antoni](#), Margus Veanes, 31st Annual ACM/IEEE Symposium on Logic in Computer Science, 873-882, New York, NY, 2016, (37% acceptance rate), contribution 55%.
- ..... **Following work done before joining the University of Wisconsin - Madison.**
- POPL 2015 **DReX: A Declarative Language for Efficiently Evaluating Regular String Transformations**, Rajeev Alur, [Loris D'Antoni](#), Mukund Raghothaman, 42nd ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, 125-137, Mumbai, India, 2015, (23% acceptance rate), contribution 40%.
- POPL 2015 **Program Boosting: Program Synthesis via Crowd-Sourcing**, Robert A Cochran, [Loris D'Antoni](#), Benjamin Livshits, David Molnar, Margus Veanes, 42nd ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, 677-688, Mumbai, India, 2015, (23% acceptance rate), contribution 40%.
- PLDI 2014 **Fast: A Transducer-Based Language for Tree Manipulation**, [Loris D'Antoni](#), Margus Veanes, Benjamin Livshits, David Molnar, 35th ACM SIGPLAN-SIGACT Symposium on Programming Language Design and Implementation, 384-394, Edinburgh, UK, 2014 (18% acceptance rate), contribution 80%.
- POPL 2014 **Minimization of Symbolic Automata**, [Loris D'Antoni](#), Margus Veanes, 41st ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, 541-554, San Diego, CA, 2014 (23% acceptance rate), contribution 60%.
- CAV 2014 **Symbolic Visibly Pushdown Automata**, [Loris D'Antoni](#), Rajeev Alur, 26th International Conference on Computer Aided Verification, 209-225, Vienna, Austria, 2014 (25% acceptance rate), contribution 90%.
- CAV 2013 **Equivalence of Extended Symbolic Finite Transducers**, [Loris D'Antoni](#), Margus Veanes, 25th International Conference on Computer-Aided Verification, St. Petersburg, Russia, 624-639, 2013 (25% acceptance rate), contribution 70%.
- IJCAI 2013 **Automated Grading of DFA Constructions**, Rajeev Alur, [Loris D'Antoni](#), Sumit Gulwani, Dileep Kini, Mahesh Viswanathan, 23rd International Joint Conference on Artificial Intelligence, 1976-1982, Beijing, China, 2013 (28% acceptance rate), contribution 60%.
- LICS 2013 **Regular Functions and Cost Register Automata**, Rajeev Alur, [Loris D'Antoni](#), Jyotirmoy V. Deshmukh, Mukund Raghothaman, Yifei Yuan, 28th Annual ACM/IEEE Symposium on Logic in Computer Science, 13-22, New Orleans, LA, USA, 2013, invited paper, contribution 30%.
- VMCAI 2013 **Static Analysis of String Encoders and Decoders**, [Loris D'Antoni](#), Margus Veanes, 14th International Conference on Verification, Model Checking, and Abstract Interpretation, 209-228, Rome, Italy, 2013, (30% acceptance rate), contribution 50%.
- ICALP 2012 **Streaming Tree Transducers**, Rajeev Alur, [Loris D'Antoni](#), 39th International Conference on Automata, Languages and Programming, 42-53, Warwick, UK, 2012 (28% acceptance rate), contribution 100%.

CONCUR 2008 **Global Progress in Dynamically Interleaved Multiparty Sessions**, Lorenzo Bettini, Mario Coppo, [Loris D'Antoni](#), Marco De Luca, Mariangiola Dezani, Nobuko Yoshida, 19th International Conference on Concurrency Theory, Toronto, Canada, 2008 (27% acceptance rate), contribution 25%.

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## Refereed Journal Papers

- TOPLAS 2022 **Solving Program Sketches with Large Constants**, [Rong Pan](#), [Qinheping Hu](#), [Rishabh Singh](#), [Loris D'Antoni](#), ACM Transactions on Programming Languages and Systems, 2022, contribution 100%.
- CACM **Automata Modulo Theories**, [Loris D'Antoni](#), Margus Veanes, Communications of the ACM, May 2021, Vol. 64 No. 5, Pages 86-95, contribution 60%.
- ..... **Following work done before joining the University of Wisconsin - Madison.**
- JACM **Streaming Tree Transducers**, Rajeev Alur, [Loris D'Antoni](#), Journal of the ACM, contribution 100%.
- FMSD 2015 **Extended symbolic finite automata and transducers**, [Loris D'Antoni](#), Margus Veanes, International journal of Formal Methods in System Design, 93-119, 2015, contribution 70%.
- TOPLAS 2015 **Fast: A Transducer-Based Language for Tree Manipulation**, [Loris D'Antoni](#), Margus Veanes, Benjamin Livshits, David Molnar, ACM Transactions on Programming Languages and Systems, 38(1): 1, 2015, contribution 80%.
- TOCHI 2015 **How Can Automatic Feedback Help Students Construct Automata?**, [Loris D'Antoni](#), Dileep Kini, Rajeev Alur, Sumit Gulwani, Mahesh Viswanathan, Bjoern Hartmann, Issue on Learning at Scale of the ACM Transactions on Computer-Human Interaction, 9:1-9:24, 2015, contribution 70%.
- ACM TODS **High-Performance Complex Event Processing over Hierarchical Data**, Barzan Mozafari, Kai Zeng, [Loris D'Antoni](#), and Carlo Zaniolo, ACM Transactions on Database Systems Special Issue on "Best of SIGMOD", 38(4): 21, 2013, contribution 10%.

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## Dissertation

PhD Dissertation **Programming using Automata and Transducers**, [Loris D'Antoni](#), University of Pennsylvania, Philadelphia, 2015.

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## Refereed Workshop Papers

- FATML 2017 **Fairness as a Program Property**, Aws Albarghouthi, [Loris D'Antoni](#), Samuel Drews, Aditya Nori, Fairness, Accountability, and Transparency in Machine Learning, New York, 2016, (acceptance rate 18%), contribution 75%.
- ..... **Following work done before joining the University of Wisconsin - Madison.**
- PLOOC 2014 **Teaching Finite Automata with AutomataTutor**, Rajeev Alur, [Loris D'Antoni](#), Sumit Gulwani, Bjoern Hartmann, Dileep Kini, Mahesh Viswanathan, 2nd Workshop on Programming Language Technologies for Online Open Courses, Edinburgh, UK, 2014, invited contribution, contribution 70%.

- FPCDSL **Sensitivity analysis using type-based constraints**, [Loris D'Antoni](#), Marco Gaboardi, 2013 Emilio Jesus Gallego Arias, Andreas Haeberlen, Benjamin C. Pierce, 1st annual workshop on Functional programming concepts in domain-specific languages, 43-50, Boston, MA, 2013, (acceptance rate 45%), contribution 50%.
- HotOS 2013 **Operating System Support for Augmented Reality**, [Loris D'Antoni](#), Alan Dunn, Suman Jana, Tadayoshi Kohno, Benjamin Livshits, David Molnar, Alexander Moshchuk, Eyal Ofek, Franziska Roesner, Scott Saponas, Margus Veanes, Helen J Wang, 14th Workshop on Hot Topics in Operating Systems, Santa Ana Pueblo, NM, 2013, (acceptance rate 30%), contribution 10%.

## Funding

- 2022 **Compositional Semantics-Guided Synthesis**, \$900,000, [Loris D'Antoni](#) (PI), Thomas Reps.  
#2023222 NSF Software and Hardware Foundations: CORE: Medium
- 2020 **Amazon Research Awards**, \$100,000, [Loris D'Antoni](#).  
Amazon
- 2020 **SPIPS: Security and Privacy in Programmable Switches**, \$1,200,000, Aditya Akella, [Loris D'Antoni](#) (co-PI), Justin Hsu.  
#2023222 NSF Secure and Trustworthy Cyberspace: CORE: Medium
- 2020 **Adaptive and Robust Stateful Load Balancing Using Reinforcement Learning**, \$41,900, [Loris D'Antoni](#) (PI).  
University of Wisconsin - Madison, Fall Research Competition
- 2020 **Proving Robustness to Data Poisoning**, \$50,000, [Loris D'Antoni](#) (PI), Aws Albargouthi.  
Facebook Probability and Programming Award
- 2020 **Programmatic Robustness in Models over Discrete Data**, \$50,000, Aws Albargouthi, [Loris D'Antoni](#) (co-PI).  
Facebook Probability and Programming Award
- 2020 **Microsoft Research Faculty Fellowship**, \$200,000, [Loris D'Antoni](#).  
Microsoft Research
- 2019 **Formal Methods for Explainable Machine Learning**, \$750,000, [Loris D'Antoni](#) (PI), Aws Albargouthi, Vikas Singh.  
#1918211 NSF: Software and Hardware Foundations: FMitF
- 2019 **Collaborative Research: Verification Mentoring Workshop at Computer Aided Verification 2019-2021**, \$33,200, [Loris D'Antoni](#).  
#1905145 NSF: CCF Division of Computing and Communication Foundations
- 2018 **Learning precise quick fixes from open-source revision histories**, \$10,000, [Loris D'Antoni](#).  
Facebook Testing and Verification Award (Partial)
- 2018 **Midwest Programming languages Summit**, \$5,000, [Loris D'Antoni](#).  
NSF: CCF Division of Computing and Communication Foundations
- 2018-2022 **Automatic Network Repair**, \$1,030,000, [Loris D'Antoni](#) (PI), Aditya Akella.  
#1763871 NSF: NeTS Medium: Collaborative
- 2018-2023 **Program Synthesis with Quantitative Guarantees**, \$500,000, [Loris D'Antoni](#) (PI).  
#1750965 NSF CAREER: CCF Division of Computing and Communication Foundations

- 2017–2020 **Formal Methods for Program Fairness**, \$1,000,000, Aws Albaroghouthi (PI), Shuchi Chawla, [Loris D'Antoni](#) (co-PI), Jerry Zhu.  
#1704117 NSF Medium: CCF Division of Computing and Communication Foundations
- 2017 **Programming languages mentoring workshop at POPL17**, \$20,000, [Loris D'Antoni](#).  
#1650816 NSF: CCF Division of Computing and Communication Foundations
- 2017–2018 **Learning common error patterns and fixes using revision histories**, \$52,100, [Loris D'Antoni](#).  
Google Research Award
- 2016–2018 **REU Participant Support**, \$16,000.00, [Loris D'Antoni](#) (PI), Aditya Akella.  
#1637516 NSF
- 2016–2018 **Foundations of Intent-based Networking**, \$339,985.00, [Loris D'Antoni](#) (PI), Aditya Akella, Aaron Amber-Jacobson.  
#1637516 NSF: AitF: Collaborative Research: CCF Division of Computing and Communication Foundations
- 2016–2017 **Applications and Foundations of Symbolic Automata and Transducers**, \$38,823, [Loris D'Antoni](#) (PI).  
University of Wisconsin - Madison, Fall Research Competition

## Teaching

- CS536 Introduction to Programming Languages and Compilers, Spring 2016 (6.22/7 recommend instructor), Fall 2016 (6.02/7 recommend instructor), Spring 2018 (5.81/7 recommend instructor), Spring 2019 (5.31/7 recommend instructor), Spring 2020 (5.43/7 recommend instructor)
- CS703 Program Verification and Synthesis, Fall 2015 (6.45/7 recommend instructor), Fall 2017 (5.85/7 recommend instructor), Fall 2018 (5.67/7 recommend instructor), Fall 2019 (6.22/7 recommend instructor), Fall 2020 (6.00/7 recommend instructor)

## PhD students

- Rahul Krishnan. 2020  
Anvay Grover. 2020  
Keith Johnson. 2020  
Kanghee Park. 2020, Co-advised with Tom Reps  
Anna Meyer. 2020, Co-advised with Aws Albarghouthi  
Yuhao Zhang. 2019, Co-advised with Aws Albarghouthi  
Jinwoo Kim. 2019  
Qinheping Hu. 2016-2021 (now Amazon)  
Samuel Drews. 2016-2020, Co-advised with Aws Albarghouthi (now Facebook)  
Kausik Subramanian. 2015-2020, Co-advised with Aditya Akella, (now Google)

## Master students

- Wiley Corning. 2020-2022  
Chen Liang. 2022, Master Thesis  
Brian Yen-Chi Chang. 2020-2021, Co-advised with Aditya Akella



Samuel Jackson. 2018-2019, Co-advised with Aws Albarghouthi  
David Merrell. 2017-2018, Co-advised with Aws Albarghouthi  
Michael Vaughn. 2015-2016

## Undergraduate students

Jack Xu. Graduating 2023  
Julien De Castelnaud. Graduating 2022  
Harrison Brewton. Graduated 2020  
Gaowei Xu (REU). Graduated 2020  
Patrick Egan (REU). Graduating 2019  
Haitian Yang (REU). Graduated 2018  
Rong Pan. Graduated 2018  
Chris Gottsacker. Graduated 2017  
Salil Dureja. Graduated 2017  
Sang Yun Park. Graduated 2017  
Isaac Evavold (REU). Graduated 2017  
Fang Wang, Graduated 2016

## Postdocs

Charlie Murphy. 2023  
Nick Giannarakis. 2020-2021, Co-advised with Aditya Akella (now Amazon)

## Talks

Theory and Practice of String Solving 2021. Virtual. Invited Talk  
Computer Aided Verification 2021. Virtual. Keynote  
UW-Madison CDIS Grant Support Workshops 2021. Virtual. Invited Talk  
UW-Madison CAREER Workshop 2020. Invited Talk: Advice on how to write a CAREER proposal  
NSF CAREER Workshop 2020. Invited Talk: Advice on how to write a CAREER proposal  
SYNT 2019. Invited Talk: How Long Will my Synthesizer Run For?  
CAV 2017. Invited Tutorial: The power of Symbolic Automata and Transducers  
MFPS XXXIII. Invited Talk: Synthesis for Network Programming  
SNAPL 2017. Invited Talk: Marrying program synthesis and computational learning theory  
Berkeley, May 2017. Talk: Adventures in Program Repair  
Stanford University, May 2017. Talk: Adventures in Program Repair  
University of Pennsylvania, May 2017. Invited Talk: Automatic Program Inversion using Symbolic Transducers  
University of Iowa, April 2017. Invited Talk: Adventures in Program Repair  
University of Washington 2016. Invited Talk: The power of Symbolic Automata  
POPL 2015, Mumbai, India. Tutorial: Programming using Automata and Transducers

## Press

- December 21, 2017 Engadget, "In 2017, society started taking AI bias seriously", <https://www.engadget.com/2017/12/21/algorithmic-bias-in-2018/>
- July 10, 2017 Wisconsin State Journal, "UW-Madison researchers tackle bias in algorithms", [http://host.madison.com/wsj/news/local/govt-and-politics/uw-software-aims-to-find-and-fix-biased-computer-programs/article\\_7f261c21-a107-5841-92b6-9ffbd69eca9a.html](http://host.madison.com/wsj/news/local/govt-and-politics/uw-software-aims-to-find-and-fix-biased-computer-programs/article_7f261c21-a107-5841-92b6-9ffbd69eca9a.html)
- July 3, 2017 UW-Madison News, "UW software aims to find and fix biased computer programs", <http://news.wisc.edu/uw-madison-researchers-tackle-bias-in-algorithms/#sthash.FeSMqqi0.gbpl> (also featured on ACM Tech News)

## Service

- PC member Computer Aided Verification Artifact Evaluation Committee, CAV-AEC, 2015  
Programming Language Technology for Open Online Courses, PLOOC 2015  
International Colloquium on Automata, Languages, and Programming, ICALP 2016  
Programming Language Design and Implementation, PLDI 2016  
Computer Aided Verification, CAV 2016  
Principles Of Programming Languages, POPL 2018  
Computer Aided Verification, CAV 2018  
22nd International Conference on Logic for Programming Artificial Intelligence and Reasoning, LPAR 2018  
Workshop on Evaluation and Usability of Programming Languages and Tools, PLATEAU 2018  
Workshop on Automatic Program Repair, APR 2020  
International Conference on Networked Systems, NETYS 2020  
Principles Of Programming Languages, POPL 2021  
Programming Language Design and Implementation, PLDI 2021  
Principles Of Programming Languages, POPL 2023  
Programming Language Design and Implementation, PLDI 2023
- ERC member Principles Of Programming Languages, POPL 2016 and 2017, Programming Language Design and Implementation, PLDI 2018
- Reviewer FoSSaCS 2013, POST 2013, CAV 2014, HSCC 2015, Logical Methods in CS, CAV 2015, FOCS 2015, JCSS, FoSSaCS 2017, STACS 2018
- Outreach Programming Languages Mentoring Workshop at POPL 17  
Midwest Programming Languages Summit 2018  
Verification Mentoring Workshop at CAV 19
- Department Student admissions 2016, 2017, 2018  
Faculty hiring 2019, 2020  
Distinguished Lecture Series organization 2018  
Publicity committee 2020

- Others Co-advanced proposal for Cluster Hire in Ethics in Computing, Data, and Information at the University of Wisconsin-Madison. Proposal advanced by: Alan Rubel (Information School and director of the Center for Law, Society and Justice), Michael Titelbaum (Vilas Distinguished Achievement Professor and Chair of the Department of Philosophy), Loris D'Antoni (Computer Sciences), Aws Albarghouthi (Computer Sciences); Noah Weeth Feinstein (Holtz Center for Science, Technology and Society, curriculum and instruction and community and environmental sociology).  
Publicity Chair at Principles of Programming Languages POPL 22

## Patents

- EP3195087A1 Gesture Processing Using a Domain-Specific Gesture Language. Benjamin Livshits, Margus Veanes, Loris D'Antoni, Lucas S. Figuereido, David Molnar
- US9355268B2 Managing Access by Applications to Perceptual Information. Loris D'Antoni, Alan Dunn, Suman Jana, Benjamin Livshits, David Molnar, Alexander Moshchuk, Eyal Ofek, Scott Saponas, Margus Veanes, and Helen J Wang

## Awards

- 2021 Phillip R. Certain-Gary D. Sandefur Letters & Science Distinguished Faculty Award
- 2021 SBES'21 Distinguished Paper Award for "Learning Quick Fixes from Code Repositories"
- 2021 SIGPLAN Research Highlight for "Proving Data-Poisoning Robustness in Decision Trees"
- 2020 Two Facebook Probability and Programming Awards
- 2020 Microsoft Research Faculty Fellowship
- 2020 POPL Student Research Competition (Undergraduates) - First place with Jinwoo Kim, University of Wisconsin - Madison, "Synthesis of Imperative Programs"
- 2020 ETAPS 2020 Selection for special issue of TOPLAS "Solving Program Sketches with Large Constants"
- 2019 Samuel Drews (co-advised with Aws Albarghouthi) wins Ivanisevic Award for University of Wisconsin dissertators
- 2018 PLDI Student Research Competition (Undergraduates) - First place with Rong Pan, University of Wisconsin - Madison, "Solving Program Sketches with Large Constants"
- 2018 Facebook Testing and Verification Award
- 2017 Google Research Award
- 2017 NSF CAREER Award
- 2017 ETAPS 2017 Best paper award nomination for "Learning symbolic automata"
- 2017 POPL Student Research Competition - Second place with Samuel Drews, University of Wisconsin - Madison, "FairSquare: A Static Analysis Tool for Algorithmic Fairness"
- 2016 WARF Discovery Challenge - First place with Michael Vaughn, University of Wisconsin - Madison, "NoFAQ: Synthesizing Command Repairs from Examples"
- 2015 Morris and Dorothy Rubinoff Award. To a graduate degree candidate whose dissertation has resulted in or could lead to innovative applications in computer technology
- 2013 CAV 2013 Selection for appearance in the journal of Formal Methods in System Design "Equivalence of Extended Symbolic Finite Transducers"

2010 Prize for outstanding thesis and academic record 2010. Università di Torino