

# Jeevana Priya Inala

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## Education

- 2016–present **Ph.D.**, *Computer Science*, Massachusetts Institute of Technology.  
Advisor: Prof. Armando Solar-Lezama
- 2015–2016 **Master of Engineering**, *Computer Science*, Massachusetts Institute of Technology, *GPA – 5/5*.  
Advisor: Prof. Armando Solar-Lezama  
Thesis: Synthesis of Domain Specific CNF Encoders for Bit-Vector Solvers
- 2012–2016 **Bachelor of Science**, *Computer Science*, Massachusetts Institute of Technology, *GPA – 4.9/5*.
- Relevant Coursework Foundations of Program Analysis; Cryptography; Cognitive Robotics; Machine Learning; Computer Systems Security; Database Systems; Multicore Programming; Automata, Computability and Complexity; Performance Engineering;

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## Publications

- Jeevana Priya Inala, Rishabh Singh. **WebRelate: Joining Web Data with Relational Data using Examples**. *To appear in POPL 2018*
- Jeevana Priya Inala, Nadia Polikarpova, Xiaokang Qiu, Ben Lerner, Armando Solar-Lezama. **Synthesis of Recursive ADT Transformations from Reusable Templates**. *TACAS 2017, Uppsala, Sweden*
- Nathaniel Herman, Jeevana Priya Inala, Yihe Huang, Lily Tsai, Eddie Kohler, Barbara Liskov, Liuba Shrira. **Type-Aware Transactions for Faster Concurrent Code**. *EuroSys 2016, London, UK*.
- Jeevana Priya Inala, Rohit Singh, Armando Solar-Lezama. **Synthesis of Domain Specific CNF Encoders for Bit-Vector Solvers**. *SAT 2016, Bordeaux, France*.

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## Experience

### Research Projects

- Sep 2016 – present **Enhancing Safety of Autonomous Driving with Program Synthesis**, CSAIL, MIT.  
Supervisor: Prof. Armando Solar-Lezama  
We are implementing a technique to synthesize control programs for self-driving cars that ensure correctness-by-construction. Our technique combines combinatorial reasoning with numerical optimization to efficiently reason about both the discrete and the continuous components of these hybrid controllers.
- Jul 2015 – May 2016 **Synthesis of Domain Specific CNF Encoders for Bit-Vector Solvers**, CSAIL, MIT.  
Supervisor: Prof. Armando Solar-Lezama  
Developed a technique to combine program synthesis and machine learning technologies to automatically generate the code for translating the theory of bit-vectors in SMT solvers to CNF clauses that can be fed into a SAT solver. Our technique is able to beat CVC4 (a state of the art SMT solver) on many bit-vector benchmarks.
- Oct 2014 – Feb 2016 **Type-Aware Transactions for Faster Concurrent Code**, CSAIL, MIT.  
Supervisors: Prof. Barbara Liskov, Prof. Eddie Kohler  
Implemented a software transactional object (STO) system that tracks semantic operations on data structures rather than low-level memory reads and writes. Evaluated the approach on STAMP benchmarks to illustrate that STO performs better than regular untyped transaction systems such as TL2.
- Sep 2013 – July 2015 **Synthesis of Recursive ADT Transformations from Reusable Sketches**, CSAIL, MIT.  
Supervisor: Prof. Armando Solar-Lezama

Implemented SYNTREC that can synthesize interesting functions involving algebraic data types and pattern matching. Uses a combination of type inference and counterexample-guided inductive synthesis (CEGIS) in order to support very high-level notations for describing the space of possible implementations that the synthesizer should consider.

### Internship

Summer 2016 **Research Intern**, MICROSOFT RESEARCH, Redmond, WA.

Developed a programming-by-example system to integrate the relational data from spreadsheets with the semi-structured web-data.

Summer 2014 **Software Engineering Intern**, GOOGLE INC., Mountain View, CA.

Designed and implemented a Mobile app for Content ID feature. Improved the app with mobile specific characteristics to show that the mobile app is better than the web app.

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### Awards

2016 - 17 Microsoft Research Women's Fellowship

2016 First place in ACM SRC grand finals

2016 Charles and Jennifer Johnson MEng Thesis First Place Award

2015 First place in PLDI student research competition

2014 - 15 Actifio Undergraduate Research and Innovation Scholar

2012 Gold medal at 13th Asian Physics Olympiad, India

2011 Gold medal and Best in Theory in 5th International Olympiad in Astronomy and Astrophysics, Poland

2012 Silver medal and Asian Girl topper in 43rd International Physics Olympiad, Estonia

2012 Secured rank 21 in the prestigious Indian Institute of Technology (IIT) Joint Entrance Examination

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### Talks

WebRelate: Joining Web Data with Relational Data using Examples, Microsoft, Redmond - Aug 2016

Synthesis of Domain Specific CNF Encoders for Bit-Vector Solvers, SAT - July 2016, SMT - July 2016, ExCAPE PI meeting - June 2016

Type Assisted Synthesis of Programs with Algebraic Data Types, PLDI SRC - June 2015, ExCAPE PI meeting - June 2015

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### Selected Course Projects

Nov 2015 **Learning with Wasserstein Loss in Caffe**, Course: 6.867 Machine Learning, MIT.

Implemented a regularized Wasserstein loss layer in Caffe. Used it to perform supervised learning on MNIST datasets and image segmentation tasks.

Dec 2014 **Concolic Execution for Django**, Course: 6.858 Computer Systems Security, MIT.

Implemented a concolic execution framework for testing Django applications. Uses Z3 solver to solve for symbolic path conditions to find the failing test case.

Jan 2013 **BatteCode**, MIT.

The 6.370 Battlecode programming competition is a unique challenge that combines battle strategy, software engineering and artificial intelligence. Implemented Bug algorithm for navigation of soldiers and other strategies such as division of soldiers into groups, group navigation and opponent strategy based strategy.