



# John Toman

## Research Interests

I am interested in using program analysis and rigorous programming language techniques to solve practical software engineering problems. In particular, my focus is on improving the soundness and precision of analyses on difficult-to-analyze, framework-based applications and automated verification of object-oriented programs.

## Education

- July, 2016 – **PhD, Computer Science**, *University of Washington*, Seattle,  
March, 2019 **Dissertation:** Learning to Adapt: Program Analyses for Configurable Software.  
Advisor: Dan Grossman
- Sept., 2014 – **Master of Science, Computer Science**, *University of Washington*, Seattle.  
June, 2016 GPA: 3.96
- Sept., 2008 – **Bachelor of Science, Computer Science**, *University of Maryland*, College Park, *Cum Laude*.  
Dec., 2012 GPA: 3.95

## Publications

John Toman and Dan Grossman. Concerto: A Framework for Combined Concrete and Abstract Interpretation. *Proceedings of the ACM on Programming Languages*, Principles of Programming Languages (POPL), January 2019. <https://homes.cs.washington.edu/~jtoman/assets/concerto-2018.pdf>.

John Toman and Dan Grossman. Legato: An At-Most-Once Analysis with Applications to Dynamic Configuration Updates. In *32nd European Conference on Object Oriented Programming (ECOOP)*, 2018. <https://homes.cs.washington.edu/~jtoman/assets/ecoop-2018.pdf>.

John Toman and Dan Grossman. Taming the Static Analysis Beast. In *2nd Summit on Advances in Programming Languages (SNAPL)*, 2017. <https://homes.cs.washington.edu/~jtoman/assets/snapl-2017.pdf>.

John Toman and Dan Grossman. Staccato: A Bug Finder for Dynamic Configuration Updates. In *30th European Conference on Object Oriented Programming (ECOOP)*, 2016. <https://homes.cs.washington.edu/~jtoman/assets/staccato-2016.pdf>.

John Toman, Stuart Pernsteiner, and Emina Torlak. Crust: A Bounded Verifier for Rust.

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In *30th Conference on Automated Software Engineering (ASE)*, 2015. <https://homes.cs.washington.edu/~jtoman/assets/crust.ase15.pdf>.

Brianna M. Ren, John Toman, T. Stephen Strickland, and Jeffrey S. Foster. The Ruby Type Checker. In *Object-Oriented Program Languages and Systems (OOPS) at Symposium on Applied Computing*, 2013. <https://homes.cs.washington.edu/~jtoman/assets/rtc-2013.pdf>.

## Undergraduate Honors Thesis

Title *Topics in Compilers*

Advisor Dr. Jeffrey Foster

Description Developed methodologies for effectively teaching advanced programming language concepts and techniques including type-inference, data flow analysis, and parsing.

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## Awards

July, 2016 **Staccato: A Bug-Finder for Dynamic Configuration Updates**, *Distinguished Artifact*, Artifact Track, ECOOP.

July, 2016 **Staccato: A Bug-Finder for Dynamic Configuration Updates**, *Distinguished Poster*, Poster Track, ECOOP.

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## Teaching and Mentoring Experience

Jan., 2019 – **Teaching Assistant, UW CSE341: Programming Languages.**

March 2019 Teaching assistant in undergraduate programming languages course: developed and presented section material, wrote exam questions, graded homework, answered questions, held office hours.

Sept., 2016 – **Teaching Assistant, UW CSE505P: Programming Languages.**

Dec., 2016 Sole teaching assistant for professionals master course of 26 students: graded homework, answered questions, developed homeworks, met with students needing help.

Sept., 2015 – **New Grad Mentor.**

June, 2016 Advised first year graduate students on navigating advisor relationships, managing research projects, balancing coursework, etc.

April, 2015 – **Undergraduate CS Mentor.**

June, 2015 Met with two undergraduate students requiring extra help in discrete mathematics: worked through homework problems and explained concepts like induction and propositional logic proofs.

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## Service

2018 PLDI AEC Program Committee

March, 2017 Department Orientation Panel

2017 ECOOP 17 Doctoral Symposium Program Committee

2017 Graduate Application Reader Committee

2016 Graduate Application Reader Committee

March, 2016 PLSE visit day activity coordinator

March, 2015 PLSE visit day activity coordinator

## Work Experience

- April 2017 – **Software Development Intern**, *Facebook*, Seattle.
- June 2017
- Developed an automatic code repair framework for defects reported by a proprietary static analysis
  - Contributed features and repaired bugs in a proprietary static analysis
  - Extended a proprietary analysis to report a new type of code defect
- July 2015 – **Software Development Intern**, *Twitter*, New York.
- Sept. 2015
- Implemented ingestion pipeline for data from major 3<sup>rd</sup> party provider
  - Designed an implemented a new location API for use by internal services
- Feb. 2013 – **Web Applications Program Manager**, *CATT Laboratory*, College Park.
- July 2014
- Oversaw a team of approximately 5 full-time faculty researchers and 6 students
  - Directed development of two real-time national traffic monitoring websites used by the public and traffic operators
  - Developed policies to increase code quality including unit testing and code review
- June 2009 – **Web Developer**, *CATT Laboratory*, College Park.
- Jan. 2013
- Maintained and added features to a real-time traffic monitoring system used by transportation agencies nationwide
  - Led the development of a public version of a real-time traffic monitoring website
- Jan. 2012 – **Research Assistant**, *PLUM Research Group*, College Park.
- Dec. 2012
- Helped develop an opt-in type checker for the dynamic language Ruby.
  - Implemented several key optimizations to improve the type-checker performance
  - Created a “lazy mode” that slightly delayed detection of type errors in exchange for improved performance