

# August Shi

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## EDUCATION

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### The University of Illinois at Urbana-Champaign

Computer Science, Ph.D.

August 2013 – Present

Expected Graduation Date: May 2020

### The University of Texas at Austin

Computer Science, BS, Turing Scholar

Electrical and Computer Engineering, BS

August 2009 – May 2013

## RESEARCH EXPERIENCE

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### The University of Illinois at Urbana-Champaign

*Research Assistant*

**08/2013 – Present**

*Advisor:* Professor Darko Marinov

- Research on regression testing and how to speed up regression testing
- Evaluated test-suite reduction, test-case reduction, and regression test selection effectiveness
- Evaluated mutation testing on intermediate representation of code

### The University of Illinois at Urbana-Champaign

*Independent Study*

**08/2013 – 12/2013**

*Advisor:* Professor Maria Garzaran

- Added vectorization for vision tracking application and evaluated effectiveness
- Translated OpenCL code for vision tracking application to C and evaluated effectiveness on CPU

### The University of Texas at Austin

*Undergraduate Research Assistant*

**12/2011 – 05/2013**

*Advisor:* Professor William Cook

- Modified Jython compiler to support batch remote procedure calls, known as Remote Batch Invocation (RBI)

## PUBLICATIONS

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### ISSTA 2018

**August Shi**, Alex Gyori, Suleman Mahmood, Peiyuan Zhao, Darko Marinov: “*Evaluating Test-Suite Reduction in Real Software Evolution*”, ACM International Symposium on Software Testing and Analysis (ISSTA), pages 84-94, Amsterdam, Netherlands, Jul. 2018 (acceptance rate: 23%, 31/130)

### ICSE Demo 2018

Alex Groce, Josie Holmes, Darko Marinov, **August Shi**, Lingming Zhang: “*An Extensible, Regular-Expression-Based Tool for Multi-Language Mutant Generation*”, International Conference on Software Engineering Demonstrations Track (ICSE Demo), pages 25-28, Gothenburg, Sweden, May 2018 (acceptance rate: 42%, 30/72)

- ICST 2018** Farah Hariri, **August Shi**, Owolabi Legunsen, Milos Gligoric, Sarfraz Khurshid, Sasa Misailovic: “*Approximate Transformations as Mutation Operators*”, IEEE International Conference on Software Testing, Verification and Validation (ICST), pages 285-296, Vasteras, Sweden, Apr. 2018 (acceptance rate: 25%, 30/119)
- ASE Demo 2017** Owolabi Legunsen, **August Shi**, Darko Marinov: “*STARTS: STatic Regression Test Selection*”, IEEE/ACM International Conference on Automated Software Engineering Tool Demonstrations Track (ASE Demo), pages 949-954, Urbana-Champaign, IL, Oct.-Nov. 2017 (acceptance rate: 63%, 20/32)
- ICSE NIER 2017** Milos Gligoric, Sarfraz Khurshid, Sasa Misailovic, **August Shi**: “*Mutation Testing Meets Approximate Computing*”, International Conference on Software Engineering New Ideas and Emerging Results (ICSE NIER), pages 3-6, Buenos Aires, Argentina, May 2017 (acceptance rate: 16%, 14/85)
- ICSE 2017** **August Shi**, Suresh Thummalapenta, Shuvendu Lahiri, Nikolaj Bjorner, Jacek Czerwonka: “*Optimizing Test Placement for Module-Level Regression Testing*”, International Conference on Software Engineering (ICSE), pages 689-699, Buenos Aires, Argentina, May 2017 (acceptance rate: 16%, 68/415)
- FSE Demo 2016** Alex Gyori, Ben Lambeth, **August Shi**, Owolabi Legunsen, Darko Marinov: “*NonDex: A tool for detecting and debugging wrong assumptions on Java API specifications*”, ACM SIGSOFT Symposium on the Foundations of Software Engineering Demo Track (FSE Demo), pages 993-997, Seattle, WA, Nov. 2016 (acceptance rate: 40%, 13/32)
- FSE 2016** Owolabi Legunsen, Farah Hariri, **August Shi**, Yafeng Lu, Lingming Zhang, Darko Marinov: “*An Extensive Study of Static Regression Test Selection in Modern Software Evolution*”, ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE), pages 583-594, Seattle, WA, Nov. 2016 (acceptance rate: 27%, 74/273)
- ISSRE 2016** Farah Hariri, **August Shi**, Hayes Converse, Darko Marinov, Sarfraz Khurshid: “*Evaluating the Effects of Compiler Optimizations on Mutation Testing at the Compiler IR Level*”, IEEE International Symposium on Software Reliability Engineering (ISSRE), pages 105-115, Ottawa, Canada, Oct. 2016 (acceptance rate: 34%, 45/130)
- ASE 2016** Mohammad Amin Alipour, **August Shi**, Rahul Gopinath, Darko Marinov, Alex Groce: “*Evaluating Non-Adequate Test-Case Reduction*”, IEEE/ACM International Conference on Automated Software Engineering (ASE), pages 16-26, Singapore, Singapore, Sept. 2016 (acceptance rate: 19%, 57/298)
- ICST 2016** **August Shi**, Alex Gyori, Owolabi Legunsen, Darko Marinov: “*Detecting Assumptions on Deterministic Implementations of Non-deterministic Specifications*”, IEEE International Conference on Software Testing, Verification and Validation (ICST), pages 80-90, Chicago, IL, Apr. 2016 (acceptance rate: 27%, 35/130)
- FSE 2015** **August Shi**, Tiffany Yung, Alex Gyori, Darko Marinov: “*Comparing and Combining Test-Suite Reduction and Regression Test Selection*”, ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE), pages 237-247, Bergamo, Italy, Sept. 2015 (acceptance rate: 25%, 74/291)

- ISSTA 2015** Alex Gyori, **August Shi**, Farah Hariri, Darko Marinov: “*Reliable Testing: Detecting State-Polluting Tests to Prevent Test Dependency*”, ACM International Symposium on Software Testing and Analysis (ISSTA), pages 223-233, Baltimore, Maryland, July 2015 (acceptance rate: 27%, 33/119)
- FSE 2014** **August Shi**, Alex Gyori, Milos Gligoric, Andrey Zaytsev, Darko Marinov: “*Balancing Trade-Offs in Test-Suite Reduction*”. ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE), pages 246-256, Hong Kong, Nov. 2014 (acceptance rate: 22%, 61/273)
- SBAC-PAD 2014** Ruben Gran Tejero, **August Shi**, Ehsan Totoni, Maria J. Garzaran: “*Evaluation of a Feature Tracking Vision Application on a Heterogeneous Chip*”. IEEE International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD), pages 246-253, Paris, France, Oct. 2014 (acceptance rate 32%, 43/132)

## PRESENTATIONS

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- *Evaluating Test-Suite Reduction in Real Software Evolution*, ISSTA 2018 conference talk, Amsterdam, Netherlands, July 2018
- *An Extensible, Regular-Expression-Based Tool for Multi-Language Mutant Generation*, ICSE Demo 2018 conference talk, Gothenburg, Sweden, May 2018
- *Optimizing Test Placement for Module-Level Regression Testing*, guest lecture in CS527: Topics in Software Engineering, University of Illinois at Urbana-Champaign, September 2017
- *Regression Testing*, guest lecture in CS498ST: Software Testing, University of Illinois at Urbana-Champaign, September 2017
- *Optimizing Test Placement for Module-Level Regression Testing*, ICSE 2017 conference talk, Buenos Aires, Argentina, May 2017
- *Optimizing Test Placement for Module-Level Regression Testing*, guest talk at University of Texas at Austin, January 2017
- *NonDex: A tool for detecting and debugging wrong assumptions on Java API specifications*, FSE 2016 conference demo talk, Seattle, Washington, November 2016
- *Evaluating Non-adequate Test-Case Reduction*, ASE 2016 conference talk, Singapore, Singapore, September 2016
- *Detecting Assumptions on Deterministic Implementations of Non-deterministic Specifications*, ICST 2016 conference talk, Chicago, IL, April 2016
- *Comparing and Combining Test-Suite Reduction and Regression Test Selection*, FSE 2015 conference talk, Bergamo, Italy, September 2015
- *Jenkins Demonstration*, guest lecture in CS427: Software Engineering I, University of Illinois at Urbana-Champaign, September 2015
- *Comparing and Combining Test-Suite Reduction and Regression Test Selection*, Microsoft, Redmond, August 2015
- *Balancing Trade-Offs in Test-Suite Reduction*, FSE 2014 conference talk, Hong Kong, November 2014
- *Balancing Trade-Offs in Test-Suite Reduction*, guest lecture in CS527: Topics in Software Engineering, University of Illinois at Urbana-Champaign, October 2014

## TEACHING EXPERIENCE

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- **Supervisor**, University of Illinois at Urbana-Champaign, one master student
  - Peiyuan Zhao, Master Thesis title: “*Comparing Module- and Class-level Regression Test Selection in Continuous Integration*”

- **Teaching Assistant** for CS427: Software Engineering I, University of Illinois at Urbana-Champaign, August 2015 – December 2015
- **Teacher** for “Software Testing for Fun, Fame, and Maybe Even Profit” course at CS @ Illinois Splash, University of Illinois at Urbana-Champaign, April 2015

## WORK EXPERIENCE

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### Microsoft and Microsoft Research

*Research Intern*

**06/2015 – 08/2015**

- Investigated moving tests between test targets in distributed build system to improve on testing time
- Developed tool to suggest movements of tests to get optimal testing machine time

### Google

*Software Development Intern*

**06/2014 – 08/2014**

- Investigated characteristics of lightweight inter-procedural optimization
- Developed tool to compare inline reports
- Evaluated performance triaging for performance regressions due to missed in-lining opportunities in compiler builds

### Amazon

*Software Development Intern*

**06/2013 – 08/2013**

- Developed internal Ruby on Rails application for information security team
- Used Ruby on Rails, SOLR, MySQL server

### Intel

*Summer Intern*

**06/2011 – 08/2011, 06/2012 – 08/2012**

- Developed debug tools for component debug team
- Developed tools that connected with software on laser probing tools for chip debugging, automating process for component debuggers
- Worked extensively in Perl and C++

### USAA

*Summer Intern*

**06/2010 – 08/2010**

- Built dynamic web pages that verified and stored internal business rules for IT Ops team
- Used Java and Apache Wicket to construct dynamic web pages

## SERVICES - VOLUNTEERING

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- Student volunteer at ASE 2017
- Student volunteer at ICST 2016
- Student volunteer at FSE 2014

## SERVICES - REVIEWING

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- Reviewed for ASE 2017
- Reviewed for PLDI Artifact Evaluation 2017
- Reviewed for TACAS 2017
- Reviewed for ASE 2016
- Reviewed for ICST 2016
- Reviewed for ASE 2015
- Reviewed for CAV 2015

- Reviewed for HVC 2014
- Reviewed for ICSE 2014

## HONORS

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- ISSTA/ECOOP 2018 Summer School (2018)
- ACM SIGSOFT Distinguished Paper Award for “*Optimizing Test Placement for Module-Level Regression Testing*” (2017)
- NSF Travel Grant for FSE (2014)
- Conference Travel Grant, UIUC (2014)
- Ray Ozzie Computer Science Fellowship, UIUC (2013)
- Turing Scholars Honors Computer Science Program, UT (2009 – 2013)
- Engineering Honors Program, UT (2009 – 2013)
- Virginia and Ernest Cockrell, Jr. Scholarship in Engineering, UT (2009 – 2013)
- The University of Texas at Austin College Scholar, UT (2009 – 2013)

## FUNDING

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- Helped prepare Qualcomm funding proposal on regression testing, \$50K (2016)
- Helped prepare Google funding proposal on flaky tests and regression testing, \$51K (2015)
- Helped prepare NSF grant proposal on performance testing, \$600K (2014)

## OPEN-SOURCE CONTRIBUTIONS

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- **STARTS**, a tool for performing static regression test selection (<https://github.com/TestingResearchIllinois/starts>)
- **NonDex**, a tool for detecting and debugging wrong assumptions on Java API specifications (<https://github.com/TestingResearchIllinois/NonDex>)
- Opened multiple pull requests to patch bugs and add features to several open-source GitHub projects, including Maven, Commons-Lang, Commons-CLI, and PIT