Kathryn T. Stolee

Assistant Professor
Department of Computer Science
North Carolina State University

+1 919 515 3305
ktstolee@ncsu.edu
http://kstolee.github.io/

Employment History

NORTH CAROLINA STATE UNIVERSITY (NCSU) .... Raleigh, NC, USA
  1/2016 – present   Assistant Professor in the Department of Computer Science

IOWA STATE UNIVERSITY (ISU) .... Ames, IA, USA
  1/2016 – present   Affiliate Assistant Professor in the Department of Computer Science
  8/2013 – 12/2015   Harpole-Pentair Assistant Professor in Software Engineering

UNIVERSITY OF NEBRASKA-LINCOLN (UNL) .... Lincoln, NE, USA
  8/2008 – 8/2013   Graduate Research Assistant
  2/2007 – 8/2008   Undergraduate Research Assistant and BugHunt Administrator

MICROSOFT CORPORATION .... Redmond, WA, USA
  5/2010 – 8/2010   Research Intern: FUSE Laboratory, Kodu Team, Published [C4] and [N2]

Education

UNIVERSITY OF NEBRASKA-LINCOLN .... Lincoln, NE, USA
  8/2013   **Doctor of Philosophy in Computer Science**
           Dissertation: *Solving the Search for Source Code*
           Advisor: Dr. Sebastian Elbaum
  8/2010   **Master of Science in Computer Science**
           Thesis: *Analysis and Transformation of Pipe-like Web Mashups for End-User Programmers*
           Advisor: Dr. Sebastian Elbaum
  5/2008   **Bachelor of Science in Computer Science** *with distinction*
           Jeffery S. Raikes School of Computer Science & Management
           Minors: Mathematics, Business Administration

Honors, Awards, Fellowships

2018	National Science Foundation CAREER Award
2018	IEEE Software Practitioners' Digest recognition for [C11]
2017	Invited to and attended Dagstuhl seminar on *Automated Program Repair*
2014	Invited to and attended Dagstuhl seminar on *The Future of Refactoring*
2013-15	Harpole-Pentair Assistant Professor of Software Engineering
2013	UNL CSE Outstanding Graduate Research Award
2012	UNL CSE Outstanding Graduate Research Award
2012	SAT/SMT Summer School Travel Grant
2011	ESEM Distinguished Paper Award for [C6]
2010	UNL CSE Outstanding Graduate Research Assistant Award
2010-13	NSF Graduate Research Fellowship Award

Research Grants

[F9]   Starter Grant with Adelaide
Office of Global Engagement, NCSU
January 1, 2019 - December 31, 2019
with   Dr. Cristoph Treude at University of Adelaide
$10,000 (PI)

[F8]   Collaborative Computing
Laboratory for Analytic Sciences
January 1, 2019 - December 31, 2019
co-PI: Emerson Murphy-Hill
$87,653 (PI)

[F7]   CAREER: On the Foundations of Semantic Code Search.
National Science Foundation Award #1749936.
August 1, 2018 - July 31, 2023.
$500,000 (PI)

[F6]   Finding Software Errors, before they find you
AC21 Funding for small international research collaboration projects 2018
co-PIs: Willem Visser (Stellenbosch University)
Michael Wahlen (University of Minnesota)
Andreas Podelki (University of Freiburg)
$9,800 (Co-PI)

[F5]   SHF: Small: Supporting Regular Expression Testing, Search, Repair, Comprehension, and Maintenance
National Science Foundation Award #1714699.
August 15, 2017 - July 31, 2020.
$499,996 (PI)

[F4]   CSC 326 Course Redesign - Creating an Agile Course to Support Software Engineering Process
NCSU DELTA: Critical Path Course Redesign Grant
August 15, 2017 - June 30, 2019.
PI   Sarah Heckman
co-PI   Chris Parnin
$36,400 (Co-PI)

[F3]   SHF: Medium: Collaborative Research: Semi and Fully Automated Program Repair and Synthesis via Semantic Code Search.
National Science Foundation Award #1645136.
July 1, 2016 - June 30, 2020.
co-PIs: Claire Le Goues (Carnegie Mellon University)
Yuriy Brun (University of Massachusetts-Amherst)
$1,200,000; NCSU Portion: **$387,661** (PI)

[F2]	SHF: EAGER: Collaborative Research: Demonstrating the Feasibility of Automatic Program Repair Guided by Semantic Code Search. **National Science Foundation Award** #1446932. July 1, 2014 - December 31, 2016.
co-PIs:	Claire Le Goues (Carnegie Mellon University) Yuriy Brun (University of Massachusetts-Amherst) $287,843; ISU Portion: **$87,539** (NCSU transfer via NSF#1646813: $31,346)
[F1]	Solving the Search for Relevant Code in Large Repositories with Lightweight Specifications. **University of Nebraska-Lincoln subcontract 25-0511-0102-002.** January 1, 2014 - June 30, 2015. **$98,075 (PI)**

Submissions Under Review

Afsoon Afzal, Manish Motwani, Kathryn T. Stolee, Yuriy Brun and Claire Le Goues. *SOSRepair: Expressive Semantic Search for Real-World Program Repair*. IEEE Transactions on Software Engineering (TSE). (submitted December 2018) (major revision in progress)

Refereed Journal Publications

[J5]   Claire Le Goues, Ciera Jaspan, Ipek Ozkaya, Mary Shaw, and Kathryn T. Stolee. *Bridging the Gap: From Research to Practical Advice*. IEEE Software. *accepted June 2018. published September 2018.* doi:10.1109/MS.2018.3571235

[J4]   Kathryn T. Stolee, Sebastian Elbaum, and Matthew B. Dwyer. *Code Search with Input/Output Queries: Generalizing, Ranking, and Assessment*. Journal of Systems and Software (JSS). *submitted August 2014. revised February 2015. accepted April 2015. published June 2016.* doi:10.1016/j.jss.2015.04.081

[J3]   Kathryn T. Stolee, Sebastian Elbaum, and Daniel Dobos. *Solving the Search for Source Code*. ACM Transactions on Software Engineering and Methodology (TOSEM). *submitted December 2013. accepted February 2014. appeared May 2014.* doi:10.1145/2581377

[J2]   Kathryn T. Stolee and Sebastian Elbaum. *Identification, Impact, and Refactoring of Smells in Pipe-like Web Mashups*. IEEE Transactions on Software Engineering (TSE). Extended version of [C6]. *submitted October 2012. revision June 2013. accepted August 2013. appeared December 2013.* doi:10.1109/TSE.2013.42

[J1]   Kathryn T. Stolee. Sebastian Elbaum, and Anita Sarma. *Discovering how End-User Programmers and their Communities Use Public Repositories: a Study on Yahoo! Pipes*. Information and Software Technology (IST). Extended version of [C7]. *accepted October 16, 2012. appeared July 2013.* doi:10.1016/j.infsof.2012.10.004

Refereed Full Conference Publications

Italicized names are students directly supervised by me.

[C17] Di Chen, Kathryn T. Stolee, and Tim Menzies. *Replicating and Scaling up Qualitative Analysis using Crowdsourcing: A Github-based Case Study*. ICPC 2019, Replications Track.

[C16] *Gina R. Bai, Brian Clee, Nischal Shrestha, Carl Chapman, Cimone Wright-Hamor* and Kathryn T. Stolee. *Exploring Problem Solving Strategies During Regular Expression Composition*. ICPC 2019, Technical Track. (acceptance rate 26%)

[C15] *Peipei Wang, Gina R. Bai* and Kathryn T. Stolee. *Exploring Regular Expression Evolution*. International Conference on Software Analysis, Evolution and Reengineering (SANER), 2019. (acceptance rate 27%) doi:10.1109/SANER.2019.8667972

[C14] *Peng Sun, Chris Brown*, Kathryn T. Stolee, and Ivan Beschastnikh. *Back to the future: specification mining using crowd intelligence*. International Conference on Software Analysis, Evolution and Reengineering (SANER), 2019. (acceptance rate 27%) doi:10.1109/SANER.2019.8668025

[C13] *Peipei Wang* and Kathryn T. Stolee. *How well are regular expressions tested in the wild?* Proceedings of the 2018 26th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering (FSE), 2018. (acceptance rate 21%) doi:10.1145/3236024.3236072

[C12] Md Masudur Rahman, Jed Barson, *Sydney Paul, Joshua Kayani,* Federico Andrés Lois, Sebastián Fernandez Quezada, Christopher Parnin, Kathryn T. Stolee, Baishakhi Ray, *Evaluating How Developers Use General-Purpose Web-Search for Code Retrieval*. International Conference on Mining Software Repositories (MSR), 2018. (acceptance rate: 33%) doi:10.1145/3196398.3196425

[C11] *Carl Chapman, Peipei Wang*, and Kathryn T. Stolee. *Exploring regular expression comprehension*. International Conference on Automated Software Engineering (ASE), 2017. (acceptance rate: 21%) doi:10.1109/ASE.2017.8115653

[C10] *Carl Chapman* and Kathryn T. Stolee. *Exploring Regular Expression Usage and Context in Python*. International Symposium on Software Testing and Analysis (ISSTA). 2016. (acceptance rate: 25%) doi:10.1145/2931037.2931073

[C9] Rafael Maiani de Mello, Kathryn T. Stolee, and Guilherme Travassos. *Investigating Samples Representativeness for Online Experiments in Java Code Search*. International Symposium on Empirical Software Engineering and Measurement (ESEM), 2015. (acceprance rate: 25%) doi:10.1109/ESEM.2015.7321205

[C8] *Yalin Ke*, Kathryn T. Stolee, Claire Le Goues, and Yuriy Brun. *Repairing Programs with Semantic Code Search*. International Conference on Automated Software Engineering (ASE), 2015. (acceptance rate: 19%) doi:10.1109/ASE.2015.60

[C7] Caitlin Sadowski, Kathryn T. Stolee and Sebastian Elbaum. *How Developers Search for Code: A Case Study*. European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering (ESEC/FSE), 2015. (acceptance rate 19%) doi:10.1145/2786805.2786855

[C6] Kathryn T. Stolee, Sebastian Elbaum, and Anita Sarma. *End-User Programmers and their Communities: An Artifact-based Analysis.* International Symposium on Empirical Software Engineering and Measurement (ESEM), pages 147-156, 2011. (acceptance rate: 32%) doi:10.1109/ESEM.2011.23 **[Distinguished Paper]**

[C5] Kathryn T. Stolee and Sebastian Elbaum. *Refactoring Pipe-like Mashups for End-User Programmers.* International Conference on Software Engineering (ICSE), pages 81-90, 2011. (acceptance rate: 14%) doi:10.1145/1985793.1985805

[C4] Jarrod Jackson, Christopher Scaffidi, and Kathryn T. Stolee. *Digging for diamonds: Identifying valuable end-user code in repositories.* International Conference on Information Science and Applications (ICISA), pages 1-10, 2011. (acceptance rate: 30%) doi:10.1109/ICISA.2011.5772326

[C3] Kathryn T. Stolee and Teale Fristoe. *Expressing Computer Science Concepts Through Kodu Game Lab.* Technical Symposium on Computer Science Education (SIGCSE), pages 99-104, 2011. (acceptance rate: 34%) doi:10.1145/1953163.1953197

[C2] Kathryn T. Stolee, Sebastian Elbaum, and Gregg Rothermel. *Revealing the Copy and Paste Habits of End Users.* IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC), pages 59-66, 2009. (acceptance rate: 25%) doi:10.1109/VLHCC.2009.5295296

[C1] Andhy Koesnandar, Sebastian Elbaum, Gregg Rothermel, Lorin Hochstein, Christopher Scaffidi, and Kathryn T. Stolee. *Using Assertions to Help End-User Programmers Create Dependable Web Macros.* Symposium on Foundations of Software Engineering (FSE), pages 124-134, 2008. (acceptance rate: 20%) doi:10.1145/1453101.1453119

Refereed Short Conference Publications

Italicized names are students directly supervised by me.

[SC8] Sarah Heckman, Kathryn T. Stolee, and Christopher Parnin. *10+ Years of Teaching Software Engineering with iTrust: the Good, the Bad, and the Ugly.* Proceedings of the 40th International Conference on Software Engineering: Software Engineering Education and Training (ICSE-SEET), 2018. doi:10.1145/3183377.3183393

[SC7] *Devarshi Singh, Varun Sekar, Brittany Johnson* and Kathryn T. Stolee. *Evaluating How Static Analysis Tools Can Reduce Code Reviewer Effort.* IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC), 2017. doi:10.1109/VLHCC.2017.8103456

[SC6] David Shriver, Sebastian Elbaum, and Kathryn T. Stolee. *At the End of Synthesis: Narrowing Program Candidates.* International Conference on Software Engineering - New Ideas and Emerging Results (ICSE NIER), 2017. doi:10.1109/ICSE-NIER.2017.7

[SC5] Felienne Hermans, Kathryn T. Stolee, and David Hoepelman. *Smells in Block-Based Programming Languages.* IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC), 2016. doi:10.1109/VLHCC.2016.7739666

[SC4] Kathryn T. Stolee and Sebastian Elbaum. *On the Use of Input/Output Queries for Code Search.* International Symposium on Empirical Software Engineering and Measurement (ESEM), pages 251-254, 2013. doi:10.1109/ESEM.2013.35

[SC3] Kathryn T. Stolee and Sebastian Elbaum. *Toward Semantic Search via SMT Solver*. Symposium on Foundations of Software Engineering (FSE NIER), pages 25:1–25:4, 2012. (acceptance rate: 20%) doi:10.1145/2393596.2393625

[SC2] Kathryn T. Stolee. *Finding Suitable Programs: Semantic Search with Incomplete and Lightweight Specifications*. Doctoral Symposium at the International Conference on Software Engineering (ICSE Doctoral Symposium), pages 1571-1574, 2012. doi:10.1109/ICSE.2012.6227034

[SC1] Kathryn T. Stolee and Sebastian Elbaum. *Exploring the Use of Crowdsourcing to Support Empirical Studies in Software Engineering*. International Symposium on Empirical Software Engineering and Measurement (ESEM), pages 35:1–35:4, 2010. (acceptance rate: 29%) doi:10.1145/1852786.1852832

Refereed Workshop Publications

[W3] *Kai Presler-Marshall, Eric Horton*, Sarah Heckman, and Kathryn T. Stolee. *Wait Wait. No, Tell Me. Analyzing Selenium Configuration Effect on Test Flakiness*. International Workshop on Automation of Software Test (AST), Collocated with ICSE 2019.

[W2] *Peng Sun* and Kathryn T. Stolee. *Exploring Crowd Consistency in a Mechanical Turk Survey*. Third International Workshop on Crowdsourcing in Software Engineering (CSI-SE), 2016. doi:10.1145/2897659.2897662

[W1] Kathryn T. Stolee, *James Saylor, and Trevor Lund*. *Exploring the Benefits of Using Redundant Responses in Crowdsourced Evaluations*. Second International Workshop on Crowdsourcing in Software Engineering (CSI-SE), 2015. doi:10.1109/CSI-SE.2015.15

Referred Poster Publications

[U1] *Andrew Hill*, Corina Pasareanu, and Kathryn T. Stolee. Automated Program Repair with Canonical Constraints. International Conference on Software Engineering Poster Track (ICSE Posters), 2018. doi:10.1145/3183440.3194999

Patents

[T1] Sebastian Elbaum and Kathryn Stolee. Searching Code by Specifying Behavior. US Patent #8972372 B2, March 3, 2015.

Invited Talks

[I9] *How Software Engineering Became My Career*. University of Nebraska-Lincoln in Lincoln, NE. September 2018. **[Distinguished Speaker]**

[I8] *Repairing Programs using Semantic Code Search*. BBN Technologies in Cambridge, MA. June 2018.

[I7]   *Making software development easier, one search at a time.* Davidson College in Davidson, NC. May 2018.

[I6]   *I get by with a little help from my friends: crowdsourced program repair.* Dagstuhl Seminar in Wadern, Germany. January 2017.

[I5]   *Code Search and Empirical Software Engineering.* Security and Software Engineering (S2ERC) Research Center Industrial Outreach Workshop at Iowa State University. July 2014.

[I4]   *Searching for Source Code with Constrained Semantic Search.* University of Massachusetts-Amherst Computer Science Seminar. November 2013.

[I3]   *Let me Do Your Homework For You.* Computer Science Colloquium Series at Iowa State University. September 5, 2013.

[I2]   *Refactoring for End-User Programmers.* Workshop on Refactoring Tools (WRT11), collocated with the International Conference on Software Engineering (ICSE). May 2011. **[Plenary]**

[I1]   *Making Software Testing Engaging and Affordable in Early Programming Classes.* Co-presented with Sebastian Elbaum at SEES (Software Engineering Educators Symposium), collocated with the Symposium on Foundations of Software Engineering (FSE). November 2010.

Invited Panels

[IP5]   *Lessons from the trenches: Young faculty answer your questions and share their experiences in getting established in their own careers.* ICSE 2018 New Faculty Symposium. May 2018.

[IP4]   *What I Wish I Had Known Before Starting Graduate School.* SPLASH PL Mentoring Workshop. October 2017.

[IP3]   *Women in Computer Engineering.* NCSU middle school girls video game camp. July 2016.

[IP2]   *Advice from Junior Faculty and Researchers.* ICSE 2016 New Faculty Symposium. May 2016.

[IP1]   *What I Wish I had Known When I Started.* ICSE 2015 New Faculty Symposium. May 2015.

Presentations

[P7]   *Enabling Reuse in EUP Through Search.* EUSES (End Users Shaping Effective Software) Annual Research Meeting. September 2013.

[P6]   *Finding Suitable Programs: Semantic Search with Incomplete and Lightweight Specifications.* Poster Presentation at SAT/SMT Summer School. June 2012.

[P5]   *Making the most of what you've got.* EUSES (End Users Shaping Effective Software) Annual Research Meeting. March 2012.

[P4] *Smells, Studies, and Similarity.* EUSES Annual Research Meeting. September 2010.

[P3] *Toward Richer Resources for End-User Programmers.* Poster Presentation at CRA-W Grad Cohort Workshop. April 2010.

[P2] *Refactoring Web Mashups.* EUSES Annual Research Meeting. November 2009.

[P1] *Web Macro Dependability and Multi-Paradigm Push and Pull of Data.* EUSES Annual Research Meeting. October 2008.

Teaching Activities

*** a new course I developed*
** a course I significantly redesigned*

North Carolina State University
Fall 2019	CSC 591/791: Automated Program Repair**
Spring 2018	CSC 495: Software Testing**
Spring 2018	CSC 712: Software Testing and Reliability*
Spring 2017	CSC 326: Software Engineering
Fall 2016	CSC 591/791: Automated Program Repair**

Iowa State University
Spring 2015	SE/COM S 417: Software Testing*
Spring 2014	SE/COM S 417: Software Testing*
Summer 2014	Undergraduate Independent Study
Fall 2013	COM S 610: Advanced Topics in Repository Analysis and Code Search**

University of Nebraska-Lincoln
03/2012 – 05/2012   CSCE 361: Software Engineering (co-taught with Dr. Gregg Rothermel)

Guest Lecturer (University of Nebraska-Lincoln)
Kodu language and analysis (Fall 2010, Fall 2011)
Testing and Analysis with BugHunt (Spring 2010, Fall 2010, Fall 2007)
Software Design Patterns (Spring 2009)

Faculty Advisor (ISU)
Fall 2013	SE 491: Senior Design Project I, client and advisor
Spring 2014	SE 492: Senior Design Project II, client and advisor

Service

Conference Organization
Artifacts Co-Chair, Foundations of Software Engineering (FSE) 2020
PC Co-Chair, International Symposium on Software Testing and Analysis Tool Demo Track (ISSTA Demo) 2018
Mentorship Chair, Foundations of Software Engineering (FSE) 2016
Publications Chair, International Conference on Requirements Engineering (RE) 2014

Program Committee Member (conference)
Posters Committee (ECOOP and ISSTA) 2018
Visual Languages and Human Centric Computing Doctoral Symposium (VL/HCC DS) 2017
International Conference on Software Engineering (ICSE) 2015, 2017, 2019

Automated Software Engineering: Expert Review Panel (ASE) 2017
International Symposium on Software Testing and Analysis, Demo Track (ISSTA Demo) 2017
Foundations of Software Engineering, Visions and Reflections Paper Track (FSE-VaR) 2016
International Conference on Software Engineering, Tools Track (ICSE Tools) 2015
International Conference on Software Maintenance and Evolution (ICSME) 2014, 2015

Program Committee Member (workshop)
Workshop on Crowdsourcing in Software Engineering (CSI-SE), Collocated with ICSE 2015, 2016, 2017
International Code Hunt Workshop on Educational Software Engineering (CHESE) 2016
Workshop on Refactoring Tools (WRT), Collocated with SPLASH 2013
Workshop on User evaluations for Software Engineering Researchers (USER), Collocated with ICSE 2013

Referee - Journals
IEEE TSC (2016), IEEE TSE (2016, 2013, 2012), IEEE Software (2016, 2015, 2013), EMSE (2017, 2016, 2015)

Sub-Reviewing - Conferences
ASE 2015, FSE 2012, PLDI 2012, ASE 2011, ISSTA 2011, FSE 2010, FASE 2010, ESEM 2009

Reviewing Proposals
NSF Panelist 2014
NSF Panelist 2016

Other Service
Student Research Competition (SRC) poster judge at ICSE 2016
External reviewer on PhD thesis at Indian Institute of Science, Bangalore, 2016

North Carolina State University Committees
2016   Written Preliminary Examination Committee

Iowa State University Committees
2015   ECpE Faculty and Staff Recruiting Committee
2015   COM S Diversity Committee
2013-15   ECpE Seminar Series Committee
2013-15   SE Undergraduate Curriculum Committee
2013-15   COM S Graduate Admissions Committee
2013-14   COM S Big Grant Ad-hoc Committee
2013-14   COM S Faculty Hiring Committee
2013   COM S Graduate Committee

Students

PhD Chair or Co-Chair:

- Justin Smith, co-advisor, 08/2018 - present, PhD in CS, expected 2019

- Peipei Wang, advisor, 01/2017 - present, PhD in CS, expected 2020

- Justin Middleton, advisor, 08/2018 - present, PhD in CS, expected 2021

- George Mathews, advisor, 01/2017 - present, PhD in CS, expected 2021

- Kai Presler-Marshal, advisor, 08/2018 - present, PhD in CS, expected 2022

- Rui Bai, advisor, 08/2016 - present, PhD in CS, expected 2022

PhD Committee Member

- Ting Dai (2020 expected)
- Denae Ford (2019)
- Vivek Nair (2018)

MS Thesis Chair:

- Carl Chapman, advisor, 05/2014 - 05/2016, MS in CS (ISU)
- Yalin Ke, advisor, 08/2014 - 12/2015, MS in CS (ISU)

Undergrad Research:

- Michelle Lemons, 08/2018-12/2018, Undergraduate Research in CS (NCSU)
- Joshua Kayani, 01/2016-12/2018, Undergraduate Research in CS (NCSU)
- Trevor Lund, 05/2014-08/2014, Undergraduate Research in CS (ISU)
- Arik Coats, ugrad, 05/2015 - 08/2015, Undergraduate Research in CS (ISU)
- James Saylor, 05/2014 - 09/2014, Undergraduate Research in CS (ISU)
- Kristin Clemens, 09/2013 - 12/2013, Undergraduate Research in CS (ISU)