Guoqing Harry Xu
Department of Computer Science
University of California, Irvine
3212 Donald Bren Hall,
Irvine, CA, 92697

Education

The Ohio State University, Columbus, OH, September 2005 to September 2011
Ph.D. in Computer Science, September 2011
Dissertation: *Analyzing Large-Scale Object-Oriented Software to Find and Remove Runtime Bloat*
The Ohio State University, Columbus, OH, September 2005 to August 2010
M.S in Computer Science, August 2010
East China Normal University, Shanghai, China, September 2002 to March 2005
M.S. in Computer Science, March 2005
East China Normal University, Shanghai, China, September 1998 to July 2002
B.S. in Computer Science, July 2002

Professional Experience

University of California, Irvine, Department of Computer Science
Associate Professor, July 2017 to present
Microsoft Research, Redmond
Visiting Researcher, July 2017 to December 2017
University of California, Irvine, Department of Computer Science
Assistant Professor, September 2011 to June 2017
The Ohio State University, Department of Computer Science and Engineering
Research Assistant, September 2005 to September 2011
IBM T. J. Watson Research Center, Dynamic Optimization Group
Research Intern/Co-op, June 2008 to March 2011
IBM China Labs
Software Engineer, January — May 2005

Research Interests

Programming languages, compilers, runtime systems, distributed systems, Big Data systems and analytics, software engineering

Publications

Underlined are research advisees/co-advisees at the time of publication.

Proceedings Edited

E2. G. Xu and W. Binder, Proceedings of the 13th International Workshop on Dynamic Analysis (WODA), ACM Press, 2015.

E1. G. Xu, T. Xie, S. Lu, D. Zhang, S. Nagarakatte, and C. Csallner, Proceedings of the 2014 Joint International Workshop on Dynamic Analysis (WODA) and Software and System Performance Testing, Debugging, and Analytics (PERTEA), ACM Press, 2014.

Journal Publications

J6. K. Nguyen, K. Wang, Y. Bu, L. Fang, and G. Xu. Understanding and Combating Memory Bloat in Managed Data-Intensive Systems, In *ACM Transactions on Software Engineering and Methodology (TOSEM)*, 27(4), Article No.12, January 2018.

J5. V. Palepu[1], G. Xu, and J. A. Jones. Dynamic Dependence Summaries, In *ACM Transactions on Software Engineering and Methodology (TOSEM)*, 26(1), Article No.2, January 2017.

J4. K. Vora[2], R. Gupta, and G. Xu. Synergistic Analysis of Evolving Graphs, In *ACM Transactions on Architecture and Code Optimization (TACO)*, 13(4), Article No. 32, October 2016.

J3. G. Xu, N. Mitchell, M. Arnold, A. Rountev, E. Schonberg, and G. Sevitsky. Scalable Runtime Bloat Detection Using Abstract Dynamic Slicing, In *ACM Transactions on Software Engineering and Methodology (TOSEM)*, 23(3), May 2014.

J2. G. Xu and A. Rountev. Precise memory leak detection for Java software using container profiling. In *ACM Transactions on Software Engineering and Methodology (TOSEM)*, 22(3), Article No. 17, 2013.

J1. R. Khatchadourian, P. Greenwood, A. Rashid, and G. Xu. Pointcut rejuvenation: Recovering pointcut expressions in evolving aspect-oriented software. In *IEEE Transactions on Software Engineering (TSE)*, 38(3), pages 642–657, 2012.

Conference Publications

C45. C. Cai, Q. Zhang, Z. Zuo, K. Nguyen, G. Xu, and Z. Su, Calling-to-Reference Context Translation via Constraint-Guided CFL Reachability, *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, accepted for publication, 2018.

C44. K. Nguyen, L. Fang, C. Navasca, G. Xu, B. Demsky, and S. Lu, Skyway: Connecting Managed Heaps in Distributed Big Data Systems, *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, pages 56–69, 2018.

C43. G. Pinto, A. Canino, F. Castor, G. Xu, and Y. D. Liu, Understanding and Overcoming Parallelism Bottlenecks in ForkJoin Applications, *32nd IEEE/ACM International Conference on Automated Software Engineering* , pages 765–775, 2017.

C42. K. Wang, A. Hussain, Z. Zuo, G. Xu, and A. A. Sani, Graspan: A Single-machine Disk-based Graph System for Interprocedural Static Analyses of Large-scale Systems Code, *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, pages 237–251, 2017.

C41. K. Vora, R. Gupta, and G. Xu, KickStarter: Fast and Accurate Computations on Streaming Graphs via Trimmed Approximations, *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, pages 389–404, 2017.

C40. K. Nguyen, L. Fang, G. Xu, B. Demsky, S. Lu, S. Alamian, and O. Mutlu, Yak: A High-performance, Big-Data-Friendly Garbage Collector, *12th USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, pages 349–365, 2016.
Ranked #1 on the overall review score ("How much I want to see this paper in conference").

C39. Z. Zuo, L. Fang, S. C. Khoo, G. Xu, and S. Lu, Low-Overhead and Fully Automated Statistical Debugging with Abstraction Refinement, *ACM SIGPLAN Conference on Object-Oriented Programming Systems, Languages, and Applications (OOPSLA)*, pages 881–896, 2016.

C38. K. Vora, G. Xu, and R. Gupta, Load the Edges You Need: A Generic I/O Optimization for Disk-based Graph Processing, *2016 USENIX Annual Technical Conference (USENIX ATC)*, pages 507–522, 2016.

[1]Co-advised with James Jones.
[2]Co-advised with Rajiv Gupta.

C37. K. Nguyen, L. Fang, G. Xu, and B. Demsky, Speculative Region-based Memory Management for Big Data Systems, *8th Workshop on Programming Languages and Operating Systems (PLOS)*, pages 27–32, 2015.

C36. L. Fang, K. Nguyen, G. Xu, B. Demsky, and S. Lu, Interruptible Tasks: Treating Memory Pressure As Interrupts for Highly Scalable Data-Parallel Programs, *ACM Symposium on Operating Systems Principles (SOSP)*, pages 394–409, 2015.

C35. K. Wang, G. Xu, Z. Su, and Y.D. Liu, GraphQ: Graph Query Processing with Abstraction Refinement – Scalable and Programmable Analytics over Very Large Graphs on a Single PC, *2015 USENIX Annual Technical Conference (USENIX ATC)*, pages 387–401, 2015.

C34. L. Fang, L. Dou, and G. Xu, PerfBlower: Quickly Detecting Memory-Related Performance Problems via Amplification, *European Conference on Object-Oriented Programming (ECOOP)*, pages 296–320, 2015.

C33. K. Nguyen, K. Wang, Y. Bu, L. Fang, J. Hu, and G. Xu, Facade: A Compiler and Runtime for (Almost) Object-Bounded Big Data Applications, *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, pages 675-690, 2015.

C32. D. Yan, G. Xu, S. Yang, and A. Rountev, LeakChecker: Practical Static Memory Leak Detection for Managed Languages, *ACM/IEEE International Conference on Code Generation and Optimization (CGO)*, pages 87–97, 2014.

C31. G. Xu, Resurrector: A Tunable Object Lifetime Profiling Technique for Optimizing Real-World Programs, *ACM SIGPLAN Conference on Object-Oriented Programming Systems, Languages, and Applications (OOPSLA)*, pages 111–130, 2013.

C30. V. Palepu, G. Xu, and J. A. Jones, Improving Efficiency of Dynamic Analysis with Dynamic Dependence Summaries, *ACM/IEEE International Conference on Automated Software Engineering (ASE)*, pages 59–69, 2013.

C29. K. Nguyen and G. Xu, Cachetor: Detecting Cacheable Data to Remove Bloat, *ACM SIGSOFT International Symposium on Foundations of Software Engineering (FSE)*, pages 268–278, 2013.

C28. M. Li, Y. Chen, L. Wang, and G. Xu. Dynamically Validating Static Memory Leak Warnings, *ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA)*, pages 112–122, 2013.

C27. Y. Bu, V. Borkar, G. Xu, and M. Carey. A Bloat-Aware Design for Big Data Applications, *ACM SIGPLAN International Symposium on Memory Management (ISMM)*, pages 119–130, 2013.

C26. G. Xu. CoCo: Sound and Adaptive Replacement of Java Collections, In *European Conference on Object-Oriented Programming (ECOOP)*, pages 1–26, 2013.

C25. G. Xu. Finding Reusable Data Structures, In *ACM SIGPLAN Conference on Object-Oriented Programming Systems, Languages, and Applications (OOPSLA)*, pages 1017–1033, 2012.

C24. S. Yang, D. Yan, G. Xu, and A. Rountev. Dynamic analysis of inefficiently-used containers, In *International Workshop on Dynamic Analysis (WODA)*, pages 30–35, 2012.

C23. G. Xu, D. Yan and A. Rountev. Static detection of loop-invariant data structures. In *European Conference on Object-Oriented Programming (ECOOP)*, pages 738–763, 2012.

C22. D. Yan, G. Xu, and A. Rountev. Rethinking Soot for summary-based whole-program analysis, In *ACM SIGPLAN International Workshop on the State Of the Art in Java Program Analysis (SOAP)*, pages 9–13, 2012.

C21. D. Yan, G. Xu and A. Rountev. Uncovering performance problems in Java applications with reference propagation profiling. In *International Conference Software Engineering (ICSE)*, 134–144, 2012.

C20. D. Yan, G. Xu, and A. Rountev. Demand-driven context-sensitive alias analysis for Java. In *ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA)*, pages 155–165, 2011.

C19. G. Xu, M. D. Bond, F. Qin, and A. Rountev. Leakchaser: Helping programmers narrow down causes of memory leaks. In *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, pages 270–282, 2011.

C18. G. Xu, N. Mitchell, M. Arnold, A. Rountev, E. Schonberg, and G. Sevitsky. Finding low-utility data structures. In *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, pages 174–186, 2010.

C17. G. Xu and A. Rountev. Detecting inefficiently-used containers to avoid bloat. In *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, pages 160–173, 2010.

C16. G. Xu, N. Mitchell, M. Arnold, A. Rountev, E. Schonberg, and G. Sevitsky. Software bloat analysis: Finding, removing, and preventing performance problems in modern large-scale object-oriented applications. In *ACM SIGSOFT FSE/SDP Workshop on the Future of Software Engineering Research (FoSER)*, pages 421–426, 2010.

C15. G. Xu, M. Arnold, N. Mitchell, A. Rountev, and G. Sevitsky. Go with the flow: Profiling copies to find runtime bloat. In *ACM SIGPLAN Conf. Programming Language Design and Implementation (PLDI)*, pages 419–430,2009.

C14. G. Xu, A. Rountev, and M. Sridharan. Scaling CFL-reachability-based points-to analysis using context-sensitive must-not-alias analysis. In *European Conference on Object-Oriented Programming (ECOOP)*, pages 98–122, 2009.

C13. R. Khatchadourian, P. Greenwood, A. Rashid, and G. Xu. Pointcut rejuvenation: Recovering pointcut expressions in evolving aspect-oriented software. In *IEEE/ACM International Conference on Automated Software Engineering (ASE)*, pages 575–579, short paper, 2009.

C12. G. Xu and A. Rountev. Merging equivalent contexts for scalable heap- cloning-based context-sensitive points-to analysis. In *ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA)*, pages 225–236, 2008.

C11. G. Xu and A. Rountev. Precise memory leak detection for Java software using container profiling. In *International Conference Software Engineering (ICSE)*, pages 151–160, 2008. ACM SIGSOFT Distinguished Paper Award.

C10. G. Xu and A. Rountev. AJANA: A general framework for source-code-level interprocedural dataflow analysis of AspectJ software. In *International Conference on Aspect-Oriented Software Development (AOSD)*, pages 36–47, 2008.

C9. A. Rountev, M. Sharp, and G. Xu. IDE dataflow analysis in the presence of large object-oriented libraries. In *International Conference on Compiler Construction (CC)*, pages 53–68, 2008.

C8. G. Xu, A. Rountev, Y. Tang and F. Qin. Efficient checkpointing of Java software using context-sensitive capture and replay. In *ACM SIGSOFT Symp. Foundations of Software Engineering (FSE)*, pages 85–94, 2007.

C7. G. Xu and A. Rountev. Regression test selection for AspectJ software. In *International Conference on Software Engineering (ICSE)*, pages 65–74, 2007. Nominated for ACM SIGSOFT Distinguished Paper Award.

C6. G. Xu. A Regression Tests Selection Technique for Aspect-Oriented Programs. In *International Workshop on Testing of Aspect-Oriented Programs (WTAOP)*, pages 15–20, 2006.

C5. G. Xu, Z. Yang, and H. Huang. JCMP: Linking Architecture with Component Building. In *IEEE Asia-Pacific Software Engineering Conference (APSEC)*, pages 592–599, 2004.

C4. G. Xu, Z. Yang, H. Huang, Q. Chen, L. Chen, and F. Xu. JAOUT: Automated Generation of Aspect-Oriented Unit Test. In *IEEE Asia-Pacific Software Engineering Conference (APSEC)*, pages 374–381, 2004.

C3. G. Xu and Z. Yang. A Novel Approach to Unit Testing: The Aspect-Oriented Way. In *International Symposium on Future Software Technology (ISFST)*, 2004.

C2. G. Xu and Z. Yang. Towards Automated Generation of Unit Test. In *China National Annual Software Application Conference (NASAC)*, In Chinese, 2004.

C1. G. Xu and Z. Yang. JMLAutoTest: A Novel Automated Testing Framework based on JML and JUnit. In *International Workshop on Formal Approaches to Testing of Software (FATES)*, 2003.

Honors and Awards

- Dahl-Nygaard (Junior) Prize (2018)
- ACM SIGPLAN Distinguished Paper Nomination for PLDI'18 (2018)
- Marquis Whos Who in America (2018)
- The Yak paper received the highest overall review score in OSDI (2016)
- Google Faculty Research Award in IoT (2016)
- UC Irvine Nominee for the Microsoft New Faculty Fellowship (2012)
- ACM SIGPLAN Doctoral Dissertation Award Finalist (2012)
- IBM Research Ph.D. Fellowship (2010)
- Distinguished Research Award, Ohio State Computer Science (2010)
- Upsilon Pi Epsilon (UPE) honor society for computer science and engineering (2010)
- Best Research Poster Award, 4th OSU/CSE Research Poster Exhibition (2010)
- ACM SIGSOFT Distinguished Paper Award (2008)
- ACM SIGSOFT Distinguished Paper Award Nomination (2007)
- Outstanding Graduate of the City of Shanghai (2002 and 2005, 1% of all graduating students in Shanghai)

Research Impact

- ONR's recent Total Platform Cyber Protection (TPCP) program (BAA: N00014-17-S-B010) was directly inspired by my research on software bloat.
- The Yak GC was re-implemented and deployed Huawei's 2012 Software Laboratories, running its telecommunication software.
- The PerfBlower paper [C34] was highlighted in the Morning Paper blog (https://blog.acolyer.org/2015/08/14/perfblower-quickly-detecting-memory-related-performance-problems-via-amplification/), whose goal is to introduce an influential CS paper every day.
- A re-implementation of PerfBlower has been deployed in Huawei China to catch performance bugs in deployed systems.

- My bloat research has made to new post on
  Navy Research News (http://www.onr.navy.mil/en/Media-Center/Press-Releases/2016/Software-Bloat.aspx)
  phys.org News (http://phys.org/news/2016-07-fat-onr-explores-ways-trim.html)
  Hot Techie News (http://hottechienews.com/2016/07/12/shedding-the-fat-onr-explores-ways-to-trim-software-bloat-improve-security)
  ...

Teaching

Courses Taught at UCI

- CS142(b), Compiler Construction Project, Spring 2018, 17 students enrolled
- CS142/CSE142, Compilers and Interpreters, Winter 2017, 85 students enrolled
- CS142/CSE142, Compilers and Interpreters, Winter 2017, 69 students enrolled
- CS142/CSE142, Compilers and Interpreters, Winter 2016, 90 students enrolled
- CS142/CSE142, Compilers and Interpreters, Winter 2015, 82 students enrolled
- CS142/CSE142, Compilers and Interpreters, Spring 2014, 186 students enrolled
- CS141/INF101/CSE141, Concepts of Programming Languages, Winter 2014, 56 students enrolled
- CS295, Memory Models, Fall 2013, 20 students enrolled
- CS253/INF212, Foundations of Program Analysis, Spring 2013, 46 students enrolled
- CS142(b), Compiler Construction Project, Winter 2013, 9 students enrolled
- CS295, Programming Language Seminar, Fall 2011, 10 students enrolled
- CS295, Run-time Techniques for Efficient and Reliable Program Execution, Winter 2012, 12 students enrolled

Students Advised

- **Postdoc Researchers**:
  Dr. Chenxi Wang (2018 –, Ph.D., Institute of Computing Technology, Chinese Academy of Science)
- **Ph.D. Students**:
  Khanh Nguyen (2012 – , advanced to candidacy in 2015, Google Ph.D. Fellowship 2017)
  Kai Wang (2013 – , advanced to candidacy in 2015)
  Cheng Cai (2015 –)
  Bojun Wang (2016 –)
  John Thorpe (2016 –, Distinguished undergraduate research award 2017) Christian Navasca (2018 –)
  Yuanqi Li (2018 –)
  Qiqi Gu (2018 –)
- **Undergraduate Students**:
  John Vincent Thorpe (2016 – 2017)
  Tim Nguyen (2016 –)
  Khanh Nguyen (2011 – 2012)
  Matthew Vincent Hartz (2015 – 2016)

- **Graduated Students**:
  Dr. Zhiqiang Zuo (PostDoc Researcher, 2015 – 2018, first employment: Assistant Professor, Nanjing University, China)
  Lu Fang (Ph.D. 2017, first employment: Research Scientist at Facebook AI)
  Keval Voral (Ph.D. 2017, first employment: Assistant Professor at Simon Fraser University)
  Yiran Xie (M.S. 2016, first employment: Google)
  Jianfei Hu (M.S. 2014, first employment: Google)

- **High-school Interns**:
  Chengxi Li (2017, college: CS at UC Berkeley)
  Lawrence Xu (2016, college: CS at Purdue)
  Emily Hu (2016, college: CS at UC Berkeley)
  Ankur Gupta (2014, college: CS UC San Diego, Regent's Scholar)
  Luis Zhang (2014, college: UC Berkeley)
  Wendy Wei (2013, college: MIT)
  Alen Min (2012, college: UCI)
  Jonathan Tsai (2012, college: UCI)

Funding

Total $ amount: $8.86M; my share: $4.49M (7/2011 – 11/2017)

- "Synergistic Software Customization: Framework, Algorithms, and Tools", Office of Naval Research, TPCP, $4,924,195, PI at UCI (with Miryung Kim and Jens Palsberg at UCLA), 1/2018—12/2022

- "SaTC: CORE: Medium: Sentinel: Constructing Secure Smart Home IoT Systems via Managed Communications", National Science Foundation, Secure & Trustworthy Cyberspace, $970,997, co-PI (with PI Brian Demsky), 10/2017—09/2020

- "Runtime System Support for Automated Object Recycling in Android", Research award from the UCI Academic Senate Council on Research, Computing and Libraries (CORCL), Sole-PI, $7,500, 02/2017—07/2017

- "REU Supplement to SHF: Medium: Collaborative Research: Improved Performance Testing and Debugging", National Science Foundation, Division of Computing and Communication Foundations, Sole-PI, $16,000, 06/2017—09/2017

- "De-bloating Managed Runtimes for Scalable Data-Intensive Systems", Office of Naval Research, Division of Mathematics, Computers, and Info Science, $616,552, sole-PI, 07/2016—06/2019

- "Improved Memory Management for Object-Oriented Big Data Systems", National Science Foundation, Division of Computer and Network Systems, $500,000, sole-PI, 08/2016—07/2019

- "REU Supplement to CSR: Small: Runtime System Support for Automated Object Recycling", National Science Foundation, Division of Computer and Network Systems, $16,000, sole-PI, 06/2016—09/2016

- "ISurf Summer Education Funds", Kookmin University, South Korea, $4,500, sole-PI, 06/2016—06/2017

- "ISurf Summer Education Funds", Kookmin University, South Korea, $7,500, sole-PI, 06/2015—06/2016

- "De-bloating Software via Automated Selection of Libraries", Office of Naval Research, Division of Mathematics, Computers, and Info Science, $509,996, sole-PI, 06/2014—06/2017

- "SHF: Medium: Collaborative Research: Improved Performance Testing and Debugging", National Science Foundation, Division of Computing and Communication Foundations, $900,000, PI at UCI (with PI Darko Marinov and Co-PI Tao Xie at UIUC), 8/2014—8/2017

- Faculty Desktop Computing Initiative (FCDI), $3,000, 01/2014—06/2014
- "Runtime System Support for Automated Object Recycling in Android", Research award from the UCI Academic Senate Council on Research, Computing and Libraries (CORCL), $5,000, 02/2014—06/2014
- "CSR: Small: Runtime System Support for Automated Object Recycling", National Science Foundation, Division of Computer and Network Systems, $365,599, sole-PI, 10/2013—09/2016
- "Techniques for Efficient Execution of Large-Scale Data-Intensive Applications", Research award from the UCI Academic Senate Council on Research, Computing and Libraries (CORCL), $5,000, 01/2013—06/2013
- Faculty Desktop Computing Initiative (FCDI), $3,000, 01/2013—06/2013
- "SASI: Compiler and Runtime System Support for Sound and Adaptive Selection of Implementations", Research award from the UCI Academic Senate Council on Research, Computing and Libraries (CORCL), $5,000, 01/2012—06/2012

Professional Activities

Organizing Committee Member

PC Co-Chair, International Workshop on SoftwAre debLoating And Delayering (SALAD'18)
PC Co-Chair, Artifact Evaluation Committee, ACM SIGSOFT ISSTA'17
PC Chair, Southern California Programming Language Workshop (SoCalPL'17)
PC Co-Chair, ACM SIGPLAN Workshop on Dynamic Analysis (WODA'15)
PC Co-Chair, International Workshop on Software and System Performance Testing, Debugging, and Analytics (PERTEA'14)
Workshop Chair, ACM SIGPLAN Conference on Principle and Practice of Parallel Programming (PPoPP'13)
PC Co-Chair, International Workshop on Software and System Performance Analytics (SSPA'12)

Program Committee Member

EPC Member, ACM OOPSLA'18
PC Member, ACM ICS'18
PC Member, ACM VEE'18
PC Member, ACM PLDI'18
ERC Member, ACM ASPLOS'18
PC Member, FEAST'17 (co-located with CCS)
PC Member, AGP'17 (co-located with ISCA)
PC Member, ACM ASPLOS'17
PC Member, ACM SIGSOFT FSE'16 Student Research Competition (SRC'16)
PC Member, ACM SIGPLAN ISMM'16
PC Member, AITO ECOOP'16
PC Co-Chair, ACM SIGPLAN WODA'15
Panelist, ACM SIGPLAN OOPSLA Doctoral Symposium'15
PC Member, ACM SIGSOFT ISSTA'15
PC Member, ACM SIGPLAN ISMM'15
PC Member, ACM SIGPLAN PLDI'15
PC Member, ACM SIGSOFT ISEC'15
PC Member, AITO ECOOP'15
PC Member, ACM SIGPLAN PLDI Student Research Competition (SRC'14)
PC Member, ACM SIGPLAN ISMM'14
ERC Member, ACM SIGPLAN PLDI'14
PC Member, ACM SIGSOFT FSE'14 Poster
PC Member, ACM SIGSOFT FSE'14 Research Demo
PC Member, ACM SIGPLAN OOPSLA'13

PC Member, International Workshop on Code OptimiSation for MultI and many Cores (COSMIC'13)
PC Member, ACM SIGPLAN OOPSLA Student Research Competition (SRC'12)

Reviewer

Science (2017)
National Science Foundation, Review Panel (2018)
Natural Sciences and Engineering Research Council of Canada, Review Panel (2018)
International Journal on Parallel and Distributed Computing (2017)
ACM Transactions on Computer Systems (2017)
IEEE Transactions on Dependable and Secure Computing (2015)
Referee for Research Foundation Flanders, FWO, Belgium (2015)
ACM Transactions on Architecture and Code Optimization (2015)
City University of Hong Kong, Young Scholars Thesis Awards (2014)
ACM Transactions on Programming Languages and Systems (2014, 2015)
ACM Transactions on Software Engineering and Methodology (2014, 2015, 2016)
Journal of Software and Systems (2014)
The Journal of Object Technology (2013)
IEEE Transactions on Computers (2012, 2017)
ACM Transactions on Embedded Computing Systems (2012)
Science of Computer Programming (2011, 2013)
International Journal on Computer Science and Technology (2011)
ACM SIGPLAN Conference on Programming Language Design and Implementation (2010, 2011)
International Conference on Software Engineering (2007-2009, 2012)
Journal on Software Practice and Experience (2008, 2013, 2015)
International Conference on Software Maintenance (2007)
International Journal on Information and Software Technology (2007)
IEEE Transactions on Software Engineering (2008, 2015, 2018)
ACM SIGSOFT International Symposium on Software Testing and Analysis (2008, 2010, 2018)
ACM SIGSOFT Symposium on the Foundations of Software Engineering (2008)

Professional Organizations

USENIX, ACM, ACM SIGPLAN, SIGOPS, and SIGSOFT

Tools released

- RStream: A single-machine, disk-based graph mining system (`https://github.com/wangk7/RStream`)
- Static analysis for contraint-guided CFL-reachability (`https://bitbucket.org/frankgt40/ctr-static`)
- Facade: a compiler and runtime for almost object-bounded big data applications (`https://bitbucket.org/khanhtn1/facade`)
- Graspan: a graph system for sophisticated program analysis (`https://github.com/Graspan`)
- Statistic debugging based on abstraction refinement (`https://drive.google.com/file/d/0B58Jj9Us3ouQU2lvTm1XRzhYbm8/view`)
- PerfBlower: Finding performance problems by amplification (`bitbucket.org/fanglu/perfblower-public`)
- GraphQ: Analytical query processing over very large graphs (`bitbucket.org/wangk7/graphq`)
- Resurrector: A tunable object-lifetime profiling technique (`jikesrvm.org/Research+Archive`)

- Demand-driven context-sensitive alias analysis for Java (`www.ics.uci.edu/~guoqingx/tools/alias.htm`)
- LeakChaser: a VM-based framework for Java memory leak detection (`jikesrvm.org/Research+Archive`)
- AJANA framework for interprocedural dataflow analysis of AspectJ programs (`www.ics.uci.edu/~guoqingx/tools/ajana.html`)

University Services

University Committees

Faculty Search Committee (2018)
Department Seminar Organizer (2014–2017)
At large Alternate Rep to the University-Wide Assembly (2013–present)
CSE Degree Program Steering Committee (2013–2014)
Council on Student Experience (2013–2014)
Admissions Committee (2012, 2013, 2018)
Steering Committee of the Software Engineering Undergraduate Program (2012–present)

Thesis Committees

Lu Fang (Ph.D., 2017)
Keval Vora (Ph.D., 2017)
Vijay Palepu (Ph.D., 2017)
Emilio Coppa (Ph.D., 2015, Sapienza University, Italy)
Gulfem Savrun Yeniceri (Ph.D., 2015)
Wei Zhang (Ph.D., 2015)
Codrut Stancu (Ph.D., 2015)
Marcelo Cintra (Ph.D., 2015)
Pouria Pirzadeh (Ph.D., 2015)
David Carrillo (Ph.D., 2015)
Byron Hawkins (M.S., 2014)
Peizhao Ou (M.S., 2014)
Haitao Zhu (Ph.D., SUNY Binghamton, 2014)
Christoph Kerschbaumer (Ph.D., 2014)
Brian Norris (M.S., 2013)
Jin Zhou (Ph.D., 2013)
Mason Chang (Ph.D., 2012)
Fang Deng (M.S., 2012)

Ph.D. Candidacy Exam Committees

Xikui Wang (2016)
Brian Belleville (2016)
Mohaned Y Qunaibit (2016)
Julian Lettner (2016)
Reyhaneh Jabbarvand Behrouz (2016)
Laleh A. Beni (2015)
Alireza Sadeghi (2015)
Pouria Pirzadeh (2015)
Tiago Muck (2015)
Bin Xu (2015)
Majid Namaki Shoushtari (2014)
Stephen Crane (2014)

Gulfem Savrun Yeniceri (2013)
David Carrillo (2013)
Elaine Seraya (2013, Department of Chemistry)
Andrei Homescu (2012)
Yingyi Bu (2011)
Wei Zhang (2011)
Christoph Kerschbaumer (2011)

Professional Talks

Keynotes

Object Orientation Meets Big Data: Performance Impact, Restoration, and Thoughts on Language Design
at European Conference on Object-Oriented Programming (ECOOP), July 2018

RStream: Marrying Relational Algebra with Streaming for Graph Mining and Computation on A Single Machine
Keynote at AGP'18, Toronto, Canada, June 2017

Language, compiler, and runtime system support towards highly scalable Big Data applications
Keynote at WODA+PEREA, Bay Area, CA, July 2014

New Directions in Software Bloat Research
at ONR Meeting on "Automating Software Complexity Reduction For Reclaiming Software Execution Efficiency and Increasing Security", The MITRE Corporation, McLean, VA, June 2013

Invited Seminar Talks

Restoring the Speed of Abstractions in Object-Oriented Data Processing
at College of William & Mary, March 2017

Marrying Generational GC and Region-based Memory Management for Highly Scalable Big Data Systems
at Hong Kong University of Science and Technology, July 2016
at Microsoft Research Redmond, July 2016
at HP Research Labs, August 2016
at University of Illinois, Urbana-Champaign, August 2016
at University of Chicago, August 2016
at Purdue University, September 2016
at University of Michigan, September 2016
at University of California, Berkeley, September 2016
at University of California, Los Angles, September 2016
at Massachusetts Institute of Technology, September 2016
at Columbia University, September 2016
at University of Massachusetts, Amherst, October 2016
at Stanford University, October 2016
at University of Texas, Austin, November 2016
at Harvard University, November 2016
at Huawei U.S. Research Lab, June 2017

Semantics-Aware Performance Optimizations
at Wechat, Tencent, Guangzhou, China, February 2013
at University of California, Irvine, CS Department Seminar Series, January 2012
at Open Forum, Software Institute, University of California, Irvine, May 2012
at Shanghai Jiao Tong University (SJTU), Shanghai, China, June 2012

at Nanjing University (NJU), Nanjing, China, June 2012
at East China Normal University (ECNU), Shanghai, China, June 2012

Analyzing Large-Scale Object-Oriented Software to Find and Remove Runtime Bloat
at School of Software, Shanghai Jiao Tong University (SJTU), Shanghai, China, June 2011
at Microsoft Research, Redmond, WA, May 2011
at Hong Kong University of Science and Technology, Hong Kong, China, April 2011
at Georgia Institute of Technology, Atlanta, GA, March 2011
at North Carolina State University, Raleigh, NC, February 2011
at Virginia Tech, Blacksburg, VA, February 2011
at University of California, Irvine, CA, February 2011
at Oregon State University, Corvalis, OR, February 2011

Profiling Copies to Find Runtime Bloat
at IBM T. J. Watson Research Center, Hawthorne, NY, June 2009

Precise Memory Leak Detection for Java Software Using Container Profiling
at 2nd Indian Software Engineering Conference, Pune, India, February 2009

Recent Conference Presentations

Graspan: A Graph System for Interprocedural Static Analysis
at ASPLOS, Xi'an, China, April 2017
Resurrector: A Tunable Object Lifetime Profiling Technique for Optimizing Real-World Programs
at OOPSLA, Indianapolis, Indiana, October 2013
CoCo: Sound and Adaptive Replacement of Java Collections
at ECOOP, Montpellier, France, July 2013
Finding Reusable Data Structures
at OOPSLA, Tucson, Arizona, October 2012
Static Detection of Loop-Invariant Data Structures
at ECOOP, Beijing, China, June 2012
LeakChaser: Helping Programmers Narrow Down Causes of Memory Leaks
at PLDI, San Jose, CA, June 2011
Software Bloat Analysis
at FOSER, Santa Fe, NM, November 2010
Detecting Inefficiently-Used Containers to Avoid Bloat
at PLDI, Toronto, Canada, June 2010
Finding Low-Utility Data Structures
at PLDI, Toronto, Canada, June 2010
Scaling CFL-Reachability-Based Points-to Analysis Using Context-Sensitive Must-Not-Alias Analysis
at ECOOP, Genova, Italy, July 2009
Go with the Flow: Profiling Copies to Find Runtime Bloat
at PLDI, Dublin, Ireland, June 2009