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Research Interests

- Program Analysis, Software Testing, Software Security, Trustworthy Systems.

Education

- Ph.D. in Computer Science, State University of New York at Stony Brook, 2000.
 - PhD Thesis: Program Transformations for Verifying Parameterized Systems.

Employment National University of Singapore, School of Computing, since 2001.

- Professor, Computer Science Department (2014 - now).
 - Provost's Chair Professor (2020 – now).
- Associate Professor, Computer Science Department (2007-2014).
- Assistant Professor, Computer Science Department (2001-2007).

Recent Projects and Initiatives

- Automated Program Repair, Ministry of Education Tier 3, Lead PI, \$7.1M, 2022-27.
- Descartes – Intelligent Modeling for Decision making in Critical Urban Systems, Co-director, NRF CREATE with CNRS France, \$25M, 2021-26.
- Software Recovery using Semantic Program Repair, DSO, Sole PI, \$1.8M, 2020-23.
- National Satellite of Excellence in Trustworthy Software Systems, Director, \$12M, 19-23.
- Trustworthy Systems from Un-trusted Component Amalgamations, PI, funded by National Research Foundation Singapore, 2015 – 20, \$6.1M.
- [Singapore Cyber-security Consortium](#), Lead PI, 16-22, \$4.8M, ~25 member companies.

Selected Publications

- [SemFix: Program Repair via Semantic Analysis](#), HDT Nguyen, D Qi, A Roychoudhury, S Chandra, ICSE 2013.
- [Coverage-based Greybox Fuzzing as Markov Chain](#), M Böhme, VT Pham, A Roychoudhury, CCS 2016.
- Directed Greybox Fuzzing, M Böhme, VT Pham, MD Nguyen, A Roychoudhury, CCS 17.
- [Angelix: Scalable Multi-line Program Patch Synthesis via Symbolic Analysis](#), S Mechtaev, J Yi and A Roychoudhury, ICSE 2016.
- [Automated Program Repair](#), C Le Goues, M Pradel, A Roychoudhury, CACM Dec 2019.

Translational Impact

- [AFLFast](#) and [AFLGo](#) as extended grey-box fuzzing tools, built on top of AFL, for detecting program vulnerabilities. AFLFast has been integrated to the regular AFL distribution after significant discussion within the AFL user group.

- [Angelix](#) tool for automated repair of C programs using symbolic execution, has been used for intelligent tutoring systems to teach programming to large cross-sections of students in India, in collaboration with Indian Institute of Technology (IIT) Kanpur.

Recent Professional Service

- Program Co-chair, International Conference on Software Engineering (ICSE) 2024.
- General Chair, ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) 2022.
- Program Chair, Intl. Symposium on Software Testing and Analysis (ISSTA) 2016.
- Associate Editor of IEEE Transactions on Software Engineering, 2014-18, ACM Transactions on Software Engineering and Methodology (2019-now), IEEE Transactions on Dependable and Secure Computing (2019 – now), Guest Editor-in-Chief ACM TOSEM Continuous Special Section on Security and SE.

Recent Student Placement

- Xiang Gao, PhD NUS → Beihang University, China as Associate Professor.
- Sergey Mechtaev, PhD NUS → University College London, UK as Lecturer.
- Shin Hwei Tan, PhD NUS → SUSTech, China, as Assistant Professor.
- Van Thuan Pham, PhD NUS → University of Melbourne, Australia, Lecturer.
- Marcel Böhme, PhD NUS → Max-Planck Institute (MPI), Germany, faculty member.
- Sudipta Chattopadhyay, PhD NUS → Assistant Professor at SUTD Singapore.

Teaching Introduced *Software Testing (undergrad)*, *Software Security (undergrad)*, authored a textbook “[Embedded Systems and Software Validation](#)” under Elsevier in 2009.

- Introduced a course Foundations of SE, building an intelligent tutoring system for programming – linking Software Engineering teaching and programming teaching.

Recent Invited Talks and Keynotes

- Conference Keynote at 27th Asia-Pacific Software Engineering Conference (APSEC) 2020, 4th IEEE/ACM Intl. Conference on Mobile Software Engineering and Systems (MobileSoft) 2017, 21st Intl. Symposium on Real-time Computing (ISORC) 2018.
- Distinguished Lecture at University of Luxembourg (Jan 2017), Peking University (Dec 2017), Max Planck Institute of Software Systems (2019), KAIST (2020).

Awards and Honors

- IEEE TCSE New Directions Award 2022 (awarded jointly with [Cristian Cadar](#)).
- ACM Distinguished Member, ACM Distinguished Speaker (2013-19).
- Distinguished/Best paper/artifact award ESEC-FSE09, ICSE20, ISSTA21, AsiaCCS21.
- Distinguished reviewer award ASE 2018.
- IBM Faculty Award 2009.

Citations <https://scholar.google.com.sg/citations?user=UxFWSJIAAAAJ&hl=en>

Other Data: Singaporean, Married, One son.