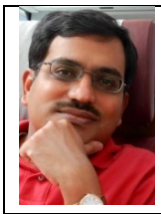

Abhik ROYCHOUDHURY

https://abhikrc.com
abhik@comp.nus.edu.sg

Professor
Department of Computer Science
School of Computing
National University of Singapore

Research Interests

- Software Testing and Analysis, 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.

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

Current Projects and Initiatives

- Automated Program Repair, Lead PI, 2022-27, Ministry of Education Tier 3 grant, SGD ~7.5M.
- Descartes: Intelligent Modeling for Decision-Making in Critical Urban Systems, 2021-26. CREATE program with CNRS, Co-director, funded by NRF, SGD 25M.
- Software Recovery using Semantic Program Repair, Lead PI, DSO Labs, 2020-22, SGD 1.8 M.
- National Satellite of Excellence on Trustworthy Software Systems, Lead PI, 2019-23, SGD 12M.
- Trustworthy Systems from Un-trusted Component Amalgamations, Lead PI, funded by National Research Foundation Singapore, 2015 – 2020, SGD 6.1M.
- Self-Healing Software, Funded by Office of Naval Research, USA, PI, 2018-20, USD 120K.

Selected Publications

- SemFix: Program Repair via Semantic Analysis, by HDT Nguyen, D Qi, A Roychoudhury, S Chandra, ICSE 2013.
- Angelix: Scalable Multi-line Program Patch Synthesis via Symbolic Analysis, by S Mechtaev, J Yi and A Roychoudhury, ICSE 2016.
- Coverage-based Greybox Fuzzing as Markov Chain, by M Böhme, VT Pham, A Roychoudhury, CCS 2016.
- Fuzzing: Challenges and Reflections, M Böhme, C Cadar, A Roychoudhury, IEEE Software 21.
- Automated Program Repair, *Review article* by C Le Goues, M Pradel and A Roychoudhury, Communications of the ACM, December 2019.

Significant PhD Student Placement

- Marcel Böhme, PhD NUS, Faculty, Max-Planck Institute for Security and Privacy, Germany.
- Sergey Mechtaev, PhD NUS moved to University College London, UK as Lecturer, winner of ACM SIGSOFT Outstanding Doctoral Dissertation Award.
- Van Thuan Pham, PhD NUS, Lecturer (Asst Prof), University of Melbourne, Australia.
- Shin Hwei Tan, PhD NUS, Chaired Associate Professor, Concordia University, Canada.

Awards, Honors, Lectures

- IEEE New Directions Award 2022 (Jointly with Cristian Cadar) for work in symbolic execution.
- ICSE 2023 Most Influential Paper Award for "SemFix: Program Repair via Semantic Analysis" (ICSE 2013 paper).
- ACM Distinguished Member 2020, ACM Distinguished Speaker 2013-19.
- IBM Faculty Award 2009, Tan Kah Kee Young Inventor's Award from Singapore 2008
- Distinguished lectures at Max Planck Institute of Software Systems (July 2019), Peking University (Dec 2017), and University of Luxembourg (Jan 2017).
- Conference Keynote at 25th Australasian Software Engineering Conference (ASWEC) 2018, 4th IEEE/ACM Intl. Conference on Mobile Software Engineering and Systems (MobileSoft) 2017, 21st Intl. Symposium on Real-time Computing (ISORC) 2018, and other venues.

Translational Impact

- AFLFast and AFLGo as extended grey-box fuzzing tools, for detecting program vulnerabilities. AFLFast has been integrated to the AFL distribution. AFL is a popular security testing tool.
- 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.
- Corebench, a benchmark suite of realistic regression errors has been widely used by the software engineering community for studying real-life complex regression errors.
- Set up Singapore Cybersecurity Consortium in 2016, the first industry Consortium in Computer Science in Singapore, consisting of 25 companies collaborating with academia in cyber-security.

Recent Professional Service

- Chair of Foundational Research Capability in Security and Privacy study from NRF 2021-22.
- Program Chair, International Conference on Software Engineering (ICSE) 2024.
- General Chair ACM SIGSOFT Foundations of Software Engineering (FSE) 2022.
- Program Chair Intl Symposium on Software Testing and Analysis (ISSTA) 2016.
- Co-chair Dagstuhl Seminar on Program Repair 2017.
- Co-chair, Shonan Meeting on Fuzzing and Symbolic Execution, 2019.
- Associate Editor, IEEE Transactions on Software Engineering, 2014-18.
- Associate Editor, IEEE Transactions on Dependable and Secure Computing, current.
- Associate Editor, ACM Transactions on Software Engineering and Methodology, current.
- Co-chair, Communications of ACM Special Section on East Asia and Oceania, April 2020.

Teaching Introduced several courses at NUS, authored a textbook on software validation.

- Foundations of Software Engineering: Teaching of foundations and project on intelligent tutoring system with the goal of deploying for teaching programming.
- Software Testing: Compare test-driven development with requirements driven development via hands-on projects
- Software Security: Introduce fuzzing, hardening and related topics.
- Art of Computer Science Research: Course to introduce PhD students to planning of PhD studies, how to choose a topic, how to evaluate contributions of papers
- Automated Software Validation: Testing, Verification, Requirements check, Self-Healing.
- Authored a textbook "Embedded Systems and Software Validation" under Elsevier in 2009. Translated by Tsinghua University Press in 2011-12.

Other Data: Singapore Citizen, Married, One son.