

	<p>Abhik ROYCHOUDHURY</p> <p><a href="https://abhikrc.com">https://abhikrc.com</a>  <a href="mailto:abhik@comp.nus.edu.sg">abhik@comp.nus.edu.sg</a></p>	<p>Professor  Department of Computer Science  School of Computing  National University of Singapore</p>
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## 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 Professor (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 Mehtaev, 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.

## Selected PhD Student Placement

- Marcel Böhme, PhD NUS, Faculty Member, Max-Planck Institute for Security and Privacy.
- Sergey Mehtaev, PhD NUS moved to University College London, as Lecturer, winner of ACM SIGSOFT Outstanding Doctoral Dissertation Award.
- Van Thuan Pham, PhD NUS, Lecturer (Asst Prof), University of Melbourne.

- Shin Hwei Tan, PhD NUS, Associate Professor (Gina Cody Research Chair), Concordia University.

### **Selected Awards and Honors**

- ICSE 2023 Most Influential Paper Award for ICSE 2013 paper “SemFix: Program Repair via Semantic Analysis”.
- IEEE TCSE New Directions Award 2022 (awarded jointly with Cristian Cadar) for contributions to symbolic execution.
- Distinguished and invited lectures / keynotes at Embedded Systems Week 2022 (education class on fuzzing), Asia Pacific Software Engineering Conference (APSEC) 2020, MobileSoft 2017, Korea Advanced Institute of Science and Tech (2020), Max Planck Institute of Software Systems (July 2019), Peking University (2017), University of Luxembourg (2017), ... and other places.

### **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.