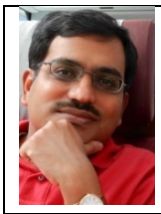

Abhik ROYCHOUDHURY

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Professor

School of Computing
National University of Singapore

Research Area. Trustworthy Software Systems.

- SW Testing and Analysis, Symbolic Execution, Fuzzing, Trustworthy AI, Program Repair.

Education. Ph.D. in Computer Science, State University of New York at Stony Brook, December 2000.

- PhD Thesis: Program Transformations for Verifying Parameterized Systems.

Employment National University of Singapore, School of Computing, from January 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 Research Projects

- Fuzz Testing, Lead PI, 2023-27, NRF National Cybersecurity R&D, SGD ~6.7M.
- 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.

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.
- Automated Repair of Programs from Large Language Models, by Z Fan, X Gao, M Mirchev, A Roychoudhury, S H Tan, ICSE 2023.
- Automated Program Repair, by C Le Goues, M Pradel and A Roychoudhury, Communications of the ACM, December 2019.

Selected Awards

- International Conference on Software Engineering (ICSE) 2023 Most Influential Paper Award for ICSE 2013 paper "SemFix: Program Repair via Semantic Analysis". This is a test-of-time award given to one paper from the ICSE meeting 10 years ago.
- IEEE TCSE New Directions Award 2022 (awarded jointly with Cristian Cadar) for contributions to symbolic execution.
- Best paper or Distinguished Paper Award from several top conferences, most recently ASE 2022.

Conference / Journal Leadership Roles

- Program Co-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.
- Program Chair, Innovations in Software Engineering Conference (ISEC) 2023.
- Associate Editor, ACM Transactions on Software Engineering and Methodology, from 2019 and Editor in Chief of the Special Section on Security and Software Engineering from 2021.
- Associate Editor, Communications of the ACM, from 2023.
- Associate Editor, IEEE Transactions on Software Engineering, 2014-18.
- Associate Editor, IEEE Transactions on Dependable and Secure Computing, 2019-23.
- Co-chair, Communications of ACM Special Section on East Asia and Oceania, April 2020.
- Co-chair Dagstuhl Seminar on Program Repair 2017.
- Co-chair Shonan Meeting on Fuzzing and Symbolic Execution, 2019.

Placement of Doctoral Students

- Xiang Gao, PhD NUS, Associate Professor, Beihang University.
- Sergey Mechtaev, PhD NUS, winner of ACM SIGSOFT Outstanding Doctoral Dissertation Award in 2019, Lecturer (Asst. Prof) University College London.
- Shin Hwei Tan, PhD NUS, Assoc Prof (Gina Cody Research Chair), Concordia University.
- Van Thuan Pham, PhD NUS, Lecturer (Asst. Prof), University of Melbourne.
- Marcel Böhme, PhD NUS, Faculty Member, Max-Planck Institute for Security and Privacy.
- Sudipta Chattopadhyay, PhD NUS, Asst Prof, Singapore Univ of Technology and Design (SUTD).
- Dawei Qi, PhD NUS, CTO, Shenzhen Secidea Network Security Technology Co. Ltd.
- Lei Ju, PhD NUS, Associate Professor, Shandong University.
- Vivy Suhendra, PhD NUS, Associate Professor of Practice, National University of Singapore.
- Tao Wang, PhD NUS, Executive Director at Morgan Stanley.

Placement of Postdoctoral Fellows

- Yannic Noller, PhD Humboldt Univ, Asst Prof, Singapore Univ of Technology and Design (SUTD).
- Zhen Dong, PhD Heidelberg, Assoc Prof, Fudan University.
- Jooyong Yi, PhD Aarhus, Asst Prof, UNIST Korea.
- Bruno C. d. S. Oliveira, PhD Oxford, Assoc Prof, Hong Kong University.
- Sun Meng, PhD Peking University, Professor, Peking University.

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 and similar program repair tools, have been used for intelligent tutoring systems to teach programming and software engineering to students in India and Malaysia, in coordination with IIT Kanpur and Monash Malaysia.
- Corebench, a benchmark suite of realistic regression errors has been widely used.
- 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.

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

- [*Introduced*] Foundations of Software Engineering: Teaching of foundations. Intelligent tutoring system built in this course project has been licensed by universities for their teaching.
- [*Introduced*] Software Testing: Compare test-driven development with requirements driven development via hands-on projects
- [*Introduced*] Software Security: Introduce fuzzing, hardening and related topics.

- [Taught] 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.
- [*Textbook*] Authored a textbook “Embedded Systems and Software Validation” under Elsevier in 2009. Translated by Tsinghua University Press in 2011-12.

Professional Service

- [2023 -] Member of SE3 Committee which coordinates the Steering Committees of all the three major software engineering conferences: ICSE, FSE and ASE.
- [2021-26] Co-director in Singapore-France interdisciplinary Collaboration program (25M funding) on using AI to serve complex decision making in smart cities. As co-director, I am responsible for the entire contingent of NUS researchers including 15 professors from Engineering and Computer Science. The program also involves significant collaboration with industry.
- [2021-22] Lead of Task force to study Foundational Research Capabilities in Security and Data Privacy for Singapore (appointed by National Research Foundation). Led a team of researchers from Singapore universities, research institutes and agencies with the goal of planning broad research directions in security and privacy for the medium to long term. The effort was conducted over a one-year period Dec 2021 – Dec 2022.
- [2016-22] Director Singapore Cybersecurity Consortium. Initiated and helped to set up a consortium of 25 companies to collaborate with academia and agencies. The work of the Consortium involved training, cyber-camps, aware-ness and discussions, apart from fostering industry academia collaboration via paired research projects. The Consortium helped set up an engagement platform between academia, industry and agencies.
- [2011-16] Assistant Dean (2011-13) and Vice Dean (2013-16) of Graduate Studies at NUS School of Computing in charge of around 500 graduate students (Masters and PhD). Involved in restructuring PhD curriculum (for more research based Qualifying Exam), and restructuring the Masters of Computing (Information Security program) with more research project experience.

Other Data

- Singapore Citizen, Married, One son.