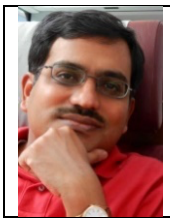

Abhik ROYCHOUDHURY

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Provost's Chair Professor, NUS

Director, National Satellite of Excellence in Trustworthy Software Systems

Lead, Singapore Cyber-security Consortium

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.

- Provost's Chair Professor (2020 – now).
- Professor, Computer Science Department (2014 - now).
- Vice Dean of Graduate Studies overseeing ~500 graduate students (2013-16).
- Associate Professor, Computer Science Department (2007-2014).
- Assistant Professor, Computer Science Department (2001-2007).

Recent Projects and Initiatives

- Software Recovery using Semantic Program Repair, DSO, PI, $1.8M, 2020-22.
- FuzzInfer: Fuzzing Protocol Implementations, DSO, PI, ~$500K, 2019-21.
- National Satellite of Excellence in Trustworthy Software Systems, PI, $12M, 2019-23.
- Trustworthy Systems from Un-trusted Component Amalgamations, PI, funded by National Research Foundation Singapore, 2015 – 2020, SGD 6.1M.
- Self-Healing Software, Office of Naval Research, USA, PI, 2018-20, USD120K.
- Singapore Cyber-security Consortium, PI, 2016-22, SGD 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.
- 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.
- Area Chair (Dependability) ICSE23, Co-chair of Dagstuhl Seminars (e.g. on Program Repair in 2017) and Shonan Meet (e.g. on Fuzzing and Symbolic Execution in 2019).

Recent Student Placement

- 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 as Lecturer.
- Marcel Böhme, PhD NUS → Max-Planck Institute (MPI) as faculty member.
- Sudipta Chattopadhyay, PhD NUS → Assistant Professor at SUTD Singapore.

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

- *Software Testing (undergrad)*, *Software Security (undergrad), Software Validation.*
- Authored a textbook "*Embedded Systems and Software Validation*" under Elsevier in 2009. Translated to Chinese by Tsinghua University Press in 2011-12.

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

- ACM Distinguished Member (2020).
- Distinguished/Best paper/artifact award ESEC-FSE09, ICSE20, ISSTA21, AsiaCCS21.
- Distinguished reviewer award ASE 2018.
- ACM Distinguished Speaker 2013-19.
- IBM Faculty Award 2009.

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