Vaibhav Sharma

18824 Pendergast Ave
Cupertino, CA 95014

Ph: 845–588–5188
vaibhav.b.sharma@gmail.com
https://sites.google.com/view/vaibhavbsharma/home

Education

- **University of Minnesota – Twin Cities, Minneapolis, USA**
  PhD, Computer Science and Engineering, GPA: 3.93/4 *2015 – 2020*

  Advisor: Professor Stephen McCamant

- **Michigan State University, East Lansing, USA**
  M.S., Computer Science and Engineering, GPA: 3.95/4 *2013 – 2015*

  Thesis: Continuous User Authentication and Identification Using User Interface Interactions
  Advisor: Professor Richard Enbody

- **Mumbai University, India**
  B.E., Computer Engineering, Aggregate: 68% *2003 – 2007*

Work Experience

- **Applied Scientist III, Amazon.com Services LLC**, July 2022 – present
  Applied Scientist II, Amazon.com Services LLC, Feb 2022 – June 2022 I work on applying automated reasoning techniques to assure payments applications used in Amazon.
- **Applied Scientist II, Amazon Web Services, Inc.**, Feb 2020 – Feb 2022 I worked on applying automated reasoning techniques to solve problems faced by customers of AWS IoT Events.
- **Research Assistant, University of Minnesota – Twin Cities**, Sept 2015 – present

  Extended a binary-level symbolic execution-based tool (FuzzBALL) for automatic synthesis of binary wrapper code which creates equivalence between two functions
- **Teaching Assistant, Michigan State University**, Aug 2013 – Aug 2015

  Delivered in-class presentations, conducted lab sessions, for 3 undergraduate-level courses
- **Samsung Research India - Bangalore**, Browser Development, June 2012 – June 2013

  Developed web page rendering modules in WebKit2EFL browser engine used in the Tizen operating system
- **Bally Technologies**, Operating System Development, March 2010 – June 2012

  Integrated a WebKitGtk+ browser engine with the slot machine operating system
- **Amdocs Development Center India**, Order Management, Aug 2007 – March 2010

  Maintained a Tuxedo-based backend of an order management system used by telecommunication companies

Publications

- Soha Hussein, Sanjai Rayadurgam, Stephen McCamant, **Vaibhav Sharma**, Mats P. E. Heimdahl, "Counterexample-Guided Inductive Repair of Reactive Contracts," *FormaliSE*, 2022
- **Vaibhav Sharma**, Soha Hussein (joint first author), Michael W. Whalen, Stephen McCamant, Willem Visser, "Java Ranger: Statically Summarizing Regions For Efficient Symbolic Execution Of Java," *Foundations of Software Engineering (FSE)*, 2020
- **Vaibhav Sharma**, "Adapter Synthesis: Synthesizing And Repairing Programs Using Scalable Symbolic Execution", Doctoral Thesis, 2020, University of Minnesota
- **Vaibhav Sharma**, Navid Emamdoost, Seonmo Kim, Stephen McCamant, "It Doesn't Have to Be So Hard: Efficient Symbolic Reasoning for CRCs," *Binary Analysis Research (BAR) Workshop*, 2019

- **Vaibhav Sharma**, Soha Hussein, Michael W. Whalen, Stephen McCamant, Willem Visser, "Java Ranger at SV-COMP 2020 (Competition Contribution)," *Tools and Algorithms for Construction and Analysis of Systems (TACAS)*, 2020
- **Vaibhav Sharma**, Kesha Hietala, Stephen McCamant, "Finding Substitutable Binary Code by Synthesizing Adaptors," *IEEE Transactions on Software Engineering*, 2019
- Taejoon Byun, **Vaibhav Sharma**, Abhishek Vijayakumar, Sanjai Rayadurgam, Darren Cofer, "Input Prioritization for Testing Neural Networks," *1st IEEE International Conference on Artificial Intelligence Testing*, 2019
- Navid Emamdoost, **Vaibhav Sharma**, Taejoon Byun, Stephen McCamant, "Binary Mutation Analysis of Tests Using Reassembleable Disassembly," *Binary Analysis Research (BAR) Workshop*, 2019
- **Vaibhav Sharma**, Taejoon Byun, Stephen McCamant, Sanjai Rayadurgam, Mats Heimdahl, "Contract Discovery From Black-box Components," *Workshop on Automated Specification Inference (WASPI)*, 2018
- **Vaibhav Sharma**, Stephen McCamant, "Synthesizing Adaptors For Binary Code Using Symbolic Execution," *Second International Workshop on Usages of Symbolic Execution (USE)*, 2018, **Best Presentation Award**
- **Vaibhav Sharma**, Kesha Hietala, Stephen McCamant, "Finding Substitutable Binary Code for Reverse Engineering by Synthesizing Adaptors," *11th IEEE Conference on Software Testing, Verification, and Validation (ICST)*, 2018
- **Vaibhav Sharma** and Richard Enbody, "User Authentication And Identification From User Interface Interactions on Touch-Enabled Devices," *10th ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec)*, 2017, **Best Paper Award Runner-up**
- **Vaibhav Sharma**, Michael W. Whalen, Stephen McCamant, Willem Visser, "Veritesting Challenges in Symbolic Execution of Java," *Java Pathfinder Workshop*, 2017
- **Vaibhav Sharma**, Taejoon Byun, Stephen McCamant, Sanjai Rayadurgam, Mats Heimdahl , "Discovering Instructions for Robust Binary-level Coverage Criteria," *Proceedings of 2017 ACM International Workshop on Testing Embedded and Cyber-Physical Systems (TECPS)*, 2017
- Taejoon Byun, **Vaibhav Sharma**, Sanjai Rayadurgam, Stephen McCamant, Mats P.E. Heimdahl, "Towards Rigorous Object-Code Coverage Criteria," *The 28th International Symposium on Software Reliability Engineering (ISSRE)*, 2017
- **Vaibhav Sharma**, Kesha Hietala, Stephen McCamant, "Finding Semantically-Equivalent Binary Code by Synthesizing Adaptors," *arXiv:1707.01536*, 2017
- **Vaibhav Sharma**, Kesha Hietala, Stephen McCamant, "Finding Semantically-Equivalent Binary Code by Synthesizing Adaptors," *Minnesota Supercomputing Institute Research Exhibition*, 2017 (poster)
- **Vaibhav Sharma**, Kesha Hietala, Stephen McCamant, "Finding Semantically-Equivalent Binary Code by Synthesizing Adaptors," *Midwest PL Summit*, 2016 (poster)
- **Vaibhav Sharma**, "Continuous User Authentication and Identification Using User Interface Interaction On Mobile Devices", Master's Thesis, 2015, Michigan State University
- **Vaibhav Sharma** and Richard Enbody, "Context-Aware Implicit Authentication For Mobile Devices" *MSU Engineering Graduate Research Symposium*, 2015 (poster)

Service

- Invited to serve on the Program Committee of the Java Pathfinder (JPF) Workshop 2022, co-located with ASE 2022
- Served on the Program Committee of International Colloquium on Theoretical Aspects of Computing (ICTAC) 2022

- Served on the Program Committee of the Industry track at ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) 2022
- Sub-reviewed for Michael W. Whalen on the technical track of International Conference on Software Engineering (ICSE) 2022
- Served on the Program Committee of the New Ideas and Emerging Results (NIER) track at Automated Software Engineering (ASE) 2021
- Served on the Program Committee of the NIER track at the IEEE International Working Conference on Source Code Analysis and Manipulation (SCAM) 2021
- Served on the Program Committee of the Industry track at ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) 2021
- Reviewed for the Transactions of Software Engineering (TSE) journal
- Served on the Program Committee of the New Ideas and Emerging Results (NIER) track at Automated Software Engineering (ASE) 2020
- Served as Artifact Evaluation Committee member at the International Symposium of Software Testing and Analysis (ISSTA) 2020
- Served as Artifact Evaluation Committee member at Automated Software Engineering (ASE) 2020
- Served on the Program Committee for Binary Analysis Research Workshop 2020 (co-located with NDSS 2020)
- Served as Jury Member and Program Committee member of the International Competition of Software Verification (SV-COMP) 2020
- Reviewer for Journal of Software Testing, Verification and Reliability (STVR) (May 2019-Dec 2019)
- Contributed optimization features, bug fixes, system call support to FuzzBALL
- Supported development of an Android app for navigating the Michigan State University campus

Awards

- Doctoral Dissertation Fellowship, University of Minnesota, 2019
- Best Paper Runner-up Award, WiSec 2017
- NSF Conference Travel Grant, WiSec 2017
- ACM Conference Travel Grant, WiSec 2017
- Richard Reid Fellowship (College of Engineering, Michigan State University), Summer 2014

Academic Projects

- "Increasing Symbolic PathFinder Performance with Bounded Static Symbolic Execution," Google Summer of Code, Summer 2017, UMN
- "Link Prefetching: A Defense Against Website Fingerprinting on Tor," Course project, Introduction to Computer Security, Fall 2015, UMN
- "Continuous User Authentication and Identification Using User Interface Interaction On Mobile Devices", Master's Thesis, Summer 2015, MSU
- "Fraudulent Resume Detection," Course project, Data Mining, Fall 2014, MSU
- "Using GA-based Feature Selection In Ensemble Classifier For Network Intrusion Detection," Course Project, Evolutionary Computation, Fall 2014, MSU

- "NFC-Powered Wireless Multi-hop Sensor Network," Course Project, Advanced Computer Networks and Communication, Fall 2013, MSU
- "Optimal Placement of Annotation Labels in Geometric Objects," B.E. Thesis, 2007

Graduate Courses

- Programming Languages
- Introduction to Compilers
- Security/Privacy in Computing
- Introduction to Computer Security
- Data Mining
- Pattern Recognition

Skills

- *Programming Languages*: C, C++, Java, OCaml
- *Revision Control Systems*: Git
- *Operating Systems*: various Linux flavors