

Sumit Lahiri

PERSONAL DATA

PORTFOLIO:	https://lahiri.netlify.com
LINKEDIN PROFILE:	https://www.linkedin.com/in/sumit-lahiri/
CURRENT STATUS:	Ph.D. Student, Dept Of CSE, IIT Kanpur, (Thesis Guide: Dr. Subhajit Roy)
RESEARCH AREAS:	Formal Methods, Program Analysis & Verification, Software Engineering
DATE OF BIRTH:	11 May, 1993
PHONE:	+91 9007342270, +91 9874812666
CONTACT EMAIL:	sumitl@cse.iitk.ac.in , lahiri.devs@gmail.com
RESEARCH GITHUB:	https://github.com/lahiri-phdworks
TECHNICAL PROFICIENCY:	C++, C, LLVM, KLEE, ESBMC, AFL/AFL++, Z3, CVC4, Dafny React, Overmind, Python3, Golang, PyTorch(ML), SeaHorn Node.js, MongoDB, PostgreSQL, Redis, WebSockets, Google Firebase, Amazon Web Services (S3, EC2, Lambda), Docker, Grafana

WORK EXPERIENCE

<i>Current</i> JULY 2020	TCS Research Scholar, Tata Consultancy Services <i>Ph.D. Research Fellow</i> Awarded TCS Research Fellowship to cover expenses and receiving stipend for Ph.D. programme. I will tentatively graduate from the Ph.D. programme by August of 2024.
<i>Aug 2019</i> AUG 2024	Ph.D. Research Student & Teaching Assistant (TA) at IIT Kanpur <i>Teaching Assistant for the following courses.</i> Developed website for ACM Winter School on Design, Implementation and Verification of Computer Systems. Taught Clang & LLVM to students. Site: https://winterschool2022.cse.iitk.ac.in/ TA: Program Analysis, Verification and Testing. Developed a program analysis framework to ease teaching this course along with other TAs. (CS639A) TA: Advanced Compiler Optimizations. (CS738A) TA: Software Development & Operations (DevOps) (CS235A). TA: Data Structures & Algorithms.(ESO207)
<i>Recent</i> JUN-DEC 2021	Remote Full Stack Developer at Pluto Office (Startup) <i>React, Overmind, Electron, Node.js, MongoDB, PostgreSQL, Socket.io, Jitsi(WebRTC)</i> Built a productivity MVP desktop application that supported instant messaging, virtual meetings, magic links, file and screen sharing along with team management features.
<i>Recent</i> MAR-SEP 2018	Remote Backend Developer at Golem Network <i>Node.js, Truffle, Clang/LLVM, protobuf, C++, Golem Smart Contracts</i> Built an EVM-Golem smart contract processing and compilation pipeline in Node.js using truffle, open-zeppelin, solc and node-parser. It also supported LLVM IR generation.
AUG-DEC 2017	Asst. Manager at TATA MOTORS, PPPM <i>Programme Manager</i> Developed a internal web MVC app to ease project deadline management and tasks tracking using data from a SAP Backend. Worked on AC Implementation Project for N2 & N3 M&HCV Vehicles.
AUG 2016-2017	Graduate Engineering Trainee at TATA MOTORS, PPPM <i>Programme Manager (GET)</i> Managed VAVE Idea tracking and implementation on M&HCV Vehicles. Completed a full-fledged report on analysis of sheet metal cutting practices in TATA Motors.

PAPER PUBLICATIONS & WORKSHOP TALKS

<i>SPLASH'22 (DS)</i> DEC 2022	Verification of Programs with Concealed Components <i>SPLASH Companion 2022, Doctoral Symposium</i> https://dl.acm.org/doi/abs/10.1145/3563768.3565551
<i>OOPSLA'22</i> SEP 2022	Symbolic Execution for Randomized Programs <i>OOPSLA'22 (Object-Oriented Programming, Systems, Languages & Applications)</i> https://dl.acm.org/doi/abs/10.1145/3563344
<i>ISSTA'22</i> JULY 2022	Almost Correct Invariants: Synthesizing Inductive Invariants by Fuzzing Proofs <i>ISSTA'22 (ACM SIGSOFT International Symposium on Software Testing and Analysis)</i> https://dl.acm.org/doi/abs/10.1145/3533767.3534381
<i>CGO'22(W)</i> APRIL 2022	The Hot Path SSA Form in LLVM. (Workshop Presentation) <i>Sixth LLVM Performance Workshop at CGO</i> https://llvm.org/devmtg/2022-04-03/#hot-path

PROJECTS

CS639A	Program Analysis, Verification & Testing Symbolic Execution, Fuzzing, Abstract Interpretation, Deductive Verification, Bounded Model Checking, Constraint Solving with Z3.
NOV 2020	Research study and implementation of a state-of-the-art software debloater from a research paper. Nominated to be one of the best projects of the course offering. Paper: https://dl.acm.org/doi/10.1145/3243734.3243838 Project: https://github.com/lahiri-phdworks/PAVT-debloating-project
CS654A	Advanced Software Architecture SW Architectural Patterns, Zachman Framework, CAP Theorem
NOV 2019	Study of the software architecture used to build modern software. Repository: https://github.com/codersguild/System-Design
CS738A	Advanced Compiler Optimizations Dataflow & Control Flow Analysis, DCE, CSE, SSA, SSA-PRE, Alias Analysis
NOV 2019	Implemented a simplified form of a C memory leak detector based on a research paper. Paper: https://suif.stanford.edu/papers/pldi03d.pdf
DEC 2019	Simplr Lang: DEVELOPED A TOY DSL FOR SMT SOLVING AND SYMBOLIC EXECUTION Developed a toy programming language in scala and used Z3 SMT Solver to demonstrate program verification Repository: https://github.com/codersguild/simplr
JULY 2022	PingTrader: STOCK ANALYSIS, AUTOMATED SCREENING AND TRADING Developed an automated screening and trading system using technical analysis indicators. Site Link: https://pingtrader.netlify.com

EDUCATION

MAY 2016	Undergraduate B.Tech Degree in MECHANICAL ENGINEERING First Class with 8.04/10 CGPA NIT Durgapur , Durgapur, WB Thesis Advisor: Dr. Apurba Layek , NIT Durgapur
MAY 2012	Higher Secondary (CBSE XII Exam) Birla High School , Kolkata, WB. GRADE: 88.0% Subjects: Physics, Maths, Chemistry, Computer Science & English.
MAY 2010	Secondary (CBSE X Exam) Birla High School , Kolkata, WB. CGPA: 9.6/10 Subjects: Maths, Science, Hindi, SST, Computer Science & English.

SCHOLASTIC ACHIEVEMENTS

MARCH 2019	GATE EXAM IN CS BRANCH: 95.5 th percentile (All-India General Category);
MAY 2012	AIEEE: 99.98 th percentile, WBJEE: 99.7 th percentile. IIT-JEE: 98.6 th percentile,