463 WCH, UC Riverside
Riverside, CA 92521
www.sanjaymalakar.com

SANJAY MALAKAR

(+1) 951-544-8582
smala009@ucr.edu
github.com/iamsanjaymalakar

RESEARCH INTERESTS

Static Program Analysis, Automated Program Repair, Compilers (LLVM/MLIR)

EDUCATION

University of California, Riverside **CA, USA** **September 2023 – Present**
- Ph.D. in Computer Science | Advisor: Prof. Manu Sridharan

University of California, Riverside **CA, USA** **September 2023 – June 2025**
- M.Sc. in Computer Science

Bangladesh University of Engineering and Technology (BUET) **Dhaka, Bangladesh** **March 2016 – February 2021**
- B.Sc. in Computer Science and Engineering | Thesis supervisor: Prof. Rifat Shahriyar

RESEARCH EXPERIENCE

Graduate Research Assistant **UC Riverside** **July 2024 - Present**

Leading independent research on program analysis and automated repair of resource management bugs.
- Developed **Arodnap**, an end-to-end tool to fix resource leaks in Java.
  - Integrates resource-specification inference, reasons about resource wrapper lifecycles, and applies minimal-scope code transformations to generate behavior-preserving patches.
  - Increased automated leak repair coverage from 41% (prior work) to 68% on an open-source benchmark of 285 projects.

Compiler Research Intern **Nissan North America, Inc. | CA, USA** **June 2025 - September 2025**

Worked with the Software-Defined Vehicles team, building a *Python → Torch-MLIR → MLIR → LLVM/RISC-V* pipeline and a fused dot-product primitive targeting custom accelerator backends for on-vehicle perception workloads.
- Designed a custom MLIR dialect/op with lowering to LLVM/RISC-V, adding an LLVM intrinsic that lowers to a custom RISC-V instruction.
- Built a runtime simulation workflow and demonstrated consistent kernel-level throughput gains on representative GEMM workloads while maintaining correctness.

Undergraduate Thesis **BUET** **March 2020 - January 2021**

Dynamic analysis–guided repair of concurrency bugs in C/C++.
- Built **RaceFixer**, a Clang LibTooling tool that leverages ThreadSanitizer reports and static analysis to repair data races and atomicity violations through lock-reuse synchronization.

PROFESSIONAL EXPERIENCE

Senior Software Engineer **OpenRefactory, Inc. | CA, USA** **February 2021 – August 2023**

Contributed to Intelligent Code Repair (**iCR**), a static application security testing (SAST) tool for Java/Python/Go.
- Designed and implemented whole-program pointer analysis with incremental re-analysis to accelerate re-scans and CI.
- Modeled threading and framework lifecycles to resolve framework-invoked callbacks and hidden call paths, improving analysis precision.
- Developed custom checkers for advanced bug detection, including taint analysis and null-pointer dereference.
- Led the migration from a monolith to Kubernetes-based microservices and established CI/CD for scalable, automated deployments.

PUBLICATIONS

1. **Repairing Leaks in Resource Wrappers**, *2025 IEEE/ACM International Conference on Automated Software Engineering (ASE'25, Accepted)*
   Sanjay Malakar, Martin Kellogg, Michael D. Ernst, Manu Sridharan
2. **Developer Discussion Topics on the Adoption and Barriers of Low-Code Software Development Platforms**, *2023 Empirical Software Engineering Journal (EMSE'23, Accepted)*
   Md Abdullah Al Alamin, Gias Uddin, **Sanjay Malakar**, Sadia Afroz, Tameem Bin Haider, Anindya Iqbal [preprint]

3. **An Empirical Study of Developer Discussions on Low-Code Software Development Challenges**, *2021 IEEE/ACM 18th International Conference on Mining Software Repositories (MSR'21, Accepted)*
   Md Abdullah Al Alamin, **Sanjay Malakar**, Gias Uddin, Sadia Afroz, Tameem Bin Haider, Anindya Iqbal [preprint]
4. **RaceFixer - An Automated Data Race Fixer**
   Sanjay Malakar, Tameem Bin Haider, Rifat Shahriar [preprint]

Teaching Experience

Graduate Teaching Assistant **University of California, Riverside** **January 2025 – March 2025**
CS 180: Introduction to Software Engineering – led labs, held office hours, and graded assignments.

Honors & Awards

- Awarded **Dean's Distinguished Fellowship** at the University of California, Riverside
- Received **Dean's Award** in Junior year from Bangladesh University of Engineering and Technology