

Sachin Kumar Goyal

Software Engineer II

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Summary

Software Engineer II with 4+ years of experience designing, developing and optimizing high-performance simulation systems, distributed pipelines, and backend services. Strong ownership of end-to-end features, from design to deployment. Expert in Modern C++, multi-threaded programming, gRPC streaming, and scalable system design. Proven ability to architect reliable, fault-tolerant systems and drive performance improvements across complex engineering workflows.

Experience

MathWorks · Hyderabad, India

Jan 2023 – Present

Software Engineer II

- Designed a high-performance terrain lookup engine using a precomputed lookup table approach, replacing sequential grid traversal and reducing 3D terrain data access time by 90% — enabling real-time simulation performance targets to be met.
- Owned end-to-end design and implementation of RoadRunner's video logging subsystem — built an offscreen OpenGL rendering pipeline that replays simulation logs frame-by-frame and exports MP4 videos at 30–60 fps, enabling programmatic video generation without UI dependency. Shipped to customers to strong positive feedback; extended to support traffic signal state and additional scenario element rendering.
- Designed a fault-tolerant gRPC streaming pipeline for simulation log datasets, implementing intelligent chunking to overcome gRPC message size limits and enable reliable large-scale data transfer across simulation components.
- Built multi-threaded systems to consume and process real-time simulation output with improved reliability across concurrent execution contexts.
- Resolved long-pending critical defects across RoadRunner modules — including crashes, memory leaks, race conditions, export failures, map processing, and lane connectivity issues — addressing cases previously unresolved by the team. Consistently triaged and resolved customer-reported high-priority bugs rapidly.
- Built an experimental natural language scenario authoring agent using Claude Code and custom skill files — converts plain English scenario descriptions into RoadRunner scenario authoring API calls, rendering scenes directly in the tool, demonstrating AI-assisted automation of complex engineering workflows.
- Developed scalable API and UI components in RoadRunner to streamline engineering workflow integration; authored design documentation covering use cases, requirements, and feature architecture for new capabilities.

MathWorks · Hyderabad, India

Jun 2022 – Dec 2022

Software Engineer (EDG)

- Implemented simulation scenario actions including actor teleportation and trajectory following aligned with OpenSCENARIO standards.
- Collaborated with cross-functional teams to align simulation requirements and delivery workflows.

Education

IIIT Hyderabad

Aug 2020 – May 2022

M.Tech, Computer Science and Engineering

- Specialized in systems and distributed computing
- Relevant coursework — Advanced Algorithms, Distributed Systems, Computer Architecture

BIT Durg

Aug 2016 – Sep 2020

B.Tech, Computer Science and Engineering

- Completed B.Tech with focus on systems and algorithms

Skills

Languages: C++ (17/14/11), Python, MATLAB

Backend: REST APIs, gRPC, Microservices

Systems: Multi-threading, Concurrency, Memory Management, Concurrent Systems

Cloud & DevOps: AWS (EC2, S3), Docker, Kafka, Jenkins, CI/CD

Frameworks & Libraries: Qt, Flask, OpenGL, OpenCV, STL

Databases: MySQL

Tools: Git, Perforce, CMake, Makefile

Specialties: Advanced Problem Solving, Object-Oriented Programming, Design Patterns, Data Structures

Projects

AI-Powered Portfolio & Resume Automation Platform (Next.js, TypeScript, Claude API, Gemini API, GitHub Actions, Typst) — Built a personal portfolio and resume automation platform where a single YAML file drives both a Next.js portfolio site and an auto-generated PDF resume. Includes a multi-provider AI CLI tool that tailors the resume per job description using Claude or Gemini API.

Achievements

- Customer Appreciation Award for delivering RoadRunner video logging feature — recognized for high impact on customer workflows
- MathWorks Hackathon 2022 — 2nd position
- GATE 2020 — All India Rank 460