

# Karthik H

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## EDUCATION

### SRM Institute of Science and Technology

*Bachelor of Science in Computer Science* **CGPA: 9.25 / 10**

Chennai, India

2023 — 2026

## PROJECTS

### Distributed Consensus Engine (Raft) | *Java, Raft, gRPC, Protocol Buffers*

Jan 2026 – Feb 2026

- Implemented **Raft consensus** with randomized leader election, gRPC log replication, conflict repair, and majority-based commits across a static 3-node cluster.
- Engineered **WAL recovery** with durable term/vote state and partial-tail recovery; verified failover and restart recovery through **56 automated tests**.

### LSM-Tree Storage Engine | *Java, LSM-Tree, WAL, SSTable, Bloom Filters*

Nov 2025 – Dec 2025

- Built an **LSM-tree storage engine** with WAL persistence, ordered MemTables, immutable SSTables, indexing, and Bloom-filter-assisted lookups.
- Implemented **compaction and tombstone handling** with concurrent access and restart recovery; validated through **9 integration tests**.

### Scalable Microservices Booking System | *Java, Spring Boot, Kafka, PostgreSQL, Redis*

Mar 2026 – Apr 2026

- Architected **Spring Boot microservices** using Kafka Saga choreography and transactional outboxes for booking, inventory, and notification workflows.
- Enforced **inventory correctness** using PostgreSQL row locking, Redis idempotency, reservation constraints, and optimistic retries.

## TECHNICAL SKILLS

**CS Fundamentals:** Data Structures & Algorithms, Problem Solving, Object-Oriented Design, Algorithm Design, Complexity Analysis

**Systems & Performance:** Distributed Systems, High-Performance Systems, Concurrency, Multithreading, Fault Tolerance, High Availability, Raft Consensus, LSM-Trees, Write-Ahead Logging, System Design, Microservices, REST APIs

**Languages:** Java, Python, C, C++, JavaScript, TypeScript, SQL, Go

**Frameworks & Libraries:** Spring Boot, Spring Security, Spring Data JPA, gRPC, React, Node.js, Express.js

**Databases & Storage:** MySQL, PostgreSQL, Redis, Data Modeling

**Tools & Practices:** Docker, Docker Compose, Git, GitHub Actions, CI/CD, AWS, Linux, JMH, Postman, IntelliJ IDEA

**Coursework:** Operating Systems, DBMS, Computer Networks, Data Structures & Algorithms, Object-Oriented Programming, AI/ML, Discrete Mathematics

## ACHIEVEMENTS

- LeetCode: 500+ problems** solved, max rating **2100 (Knight, top 3% globally)** — strong algorithm design, data structures, and complexity analysis.

## LEADERSHIP & EXTRACURRICULARS

### Technical Team Associate (Inferknow)& Class Representative

*SRM Institute of Science and Technology*

- 70% reduction in manual registration effort** — built and deployed a real-time event management platform used by **250+ participants**, streamlining event operations end-to-end.
- Organized **3+ technical events** including hackathons and coding contests; represented **60+ students** in faculty meetings, resolving academic and operational issues.