

# Tejas Ramakrishnan

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Database engineer: storage engines, query processing, indexing, and distributed systems

## ABOUT ME

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I am an undergraduate systems engineer focused on database internals: storage engines, indexing structures (B+ trees, LSM trees), query processing, and distributed systems. I enjoy building high-performance systems from first principles and reasoning about the trade-offs between correctness, scalability, and low-latency performance.

## EDUCATION

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### PES University

Bachelor of Technology in Computer Science and Engineering

Aug 2023 — May 2027

Bangalore, India

- **CGPA: 9.03/10**
- MRD Scholarship Recipient (Top 5% of the university)

## EXPERIENCE

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### The Innovation Lab

Research Intern

Bangalore, India

June 2025 — August 2025

- Developed [PrefHEtch](#) in a team of 4 to build a private vector search system delivering fast, scalable similarity search at petabyte-relevant scale.
- Achieved  $\sim 2.4x$ – $4.2x$  lower latencies at 10M vectors versus existing systems using a two-phase retrieval design and novel cryptographic optimizations.
- Worked with FAISS and homomorphic encryption in modern C++ to balance accuracy, scalability, and cryptographic overhead.

*Techstack*: FAISS, C++, Homomorphic Encryption, Microsoft SEAL, Protobuf, Docker

## PUBLICATIONS

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**PrefHEtch: The Cost of Query Privacy in Encrypted Vector Search, and a Two-Phase Design That Reduces It**, August 2026

- *Tejas Ramakrishnan, Anirudh Sudhir, Pranavjeet S, Tharun N Nanju*
- Under review at [VecDB26@VLDB](#)

**Reusable Intermediate Results in Machine Learning Pipelines: A Survey**, Accepted at ICCAI 2026

April 2026

- *Suchitra Shankar, Tejas Ramakrishnan, Amogh Acharya, Greeshma Y P, Dr. Prajwala T R*
- Surveyed techniques for reusing intermediate artifacts in data and ML pipelines to reduce recomputation and improve system efficiency.

## PROJECTS

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**Huus: Persistent Key-Value Store**, Golang

[github.com/tejas-techstack/huus](https://github.com/tejas-techstack/huus)

- Built a persistent key-value store using a disk-backed B+ Tree index, achieving  $\sim 50K$  inserts/sec under random-write benchmarks.
- Implemented Write-Ahead Logging (WAL) for durability and crash recovery, plus a REPL interface to query the engine.
- Applied storage engine techniques used in modern analytical databases, including slotted paging and index optimizations.

*Techstack*: Golang, B+ Trees, WAL, Storage Engines, SQL, File I/O

**MiniRaft: Distributed Collaborative Drawing Tool**, Golang, Javascript

[github.com/softserves/Mini-RAFT](https://github.com/softserves/Mini-RAFT)

- Implemented the Raft consensus protocol to support a replicated, fault-tolerant collaborative application.
- Built leader election, log replication, and fault-tolerant state synchronization across nodes.
- Developed a web interface to visualize replicated state updates across the cluster.

*Techstack*: Golang, Raft Protocol, Distributed Systems, Replication, ViteJS

**Queryable Intermediate Results Store (QIRS)**, C++, Python

[github.com/QIRS-Capstone](https://github.com/QIRS-Capstone)

- Built a system to reuse intermediate results generated during data and ML pipeline executions.
- Designed a lightweight intermediate results store with fine-grained caching mechanisms.
- Implemented a reuse engine that dynamically decides reuse strategies during pipeline execution over a DAG.

**Techstack** : C++, Python, Data Stores, Caching, Docker, Semantic Hashing, DAG

**SmartGC: Pseudo Garbage Collector**, C, Python

[github.com/tejas-techstack/SmartGC](https://github.com/tejas-techstack/SmartGC)

- Developed a lightweight prototype tool to detect and free unused memory in C programs.
- Built heuristics to track allocation patterns and reduce memory leaks.
- Achieved low-overhead, automatic memory de-allocation in sample programs.

**Techstack** : C, Garbage Collection, Memory Management

**Psh: POSIX-Compliant Shell**, C

[github.com/homebrew-ec-foss/psh](https://github.com/homebrew-ec-foss/psh)

- Led a 5-member team to build a POSIX-compliant shell from scratch in C.
- Implemented built-in commands, piping, redirection, job control, aliases, autocomplete, and command history.
- Focused on process management, file descriptors, and Unix systems programming.

**Techstack** : C, POSIX, Linux, Operating Systems, Shell Programming

**MQTT-Clone**, Python

[github.com/tejas-techstack/mqtt-clone](https://github.com/tejas-techstack/mqtt-clone)

- Built an MQTT broker and client library from scratch using raw TCP sockets in Python.
- Implemented core packet handling, topic-based publish/subscribe messaging, and client session management.
- Secured communication with TLS/SSL for encrypted message transmission.

**Techstack** : Python, TCP Sockets, MQTT, SSL/TLS, Networking

## TECHNICAL INTERESTS

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- Database Internals (B+ Trees, LSM Trees, Storage Engines, Indexing), Distributed Systems, Query Processing, Parallel & Systems Programming

## SKILLS

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- **Programming Languages**: C++, Go, C, Rust, Python, SQL, JavaScript, Bash
- **Databases**: PostgreSQL, MySQL, SQLite, MongoDB
- **Technologies & Tools**: Git, FAISS, Microsoft SEAL, Docker, Linux
- **Concepts**: B+ Trees, WAL, Storage Engines, Caching, Process Control, Networking Protocols, Replication

## ACHIEVEMENTS

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- Vice Chair, ACM PESUECC (Aug 2025 - Apr 2026)
- 2nd Place, Ingenious Hackathon – SmartGC
- Special Mention, Delta Time Hackathon – 2D Multiplayer Racing Game (Godot)

## COMMUNITY & VOLUNTEERING

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- Emcee and volunteer for Rootconf: Topical edition on databases
- Volunteer for Bengaluru Systems
- Mentor, HackerSpace PESUECC – Guided students in open-source contributions and systems programming projects.
- Git & GitHub Workshop Organizer – Conducted a campus workshop on Git, PRs, merge conflicts, and GitHub usage.
- Core Organizer, Hacknight 7.0 – Coordinated logistics, participant onboarding, and technical mentorship.