

PARRVA CHIRAG SHAH

Vadodara, Gujarat

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EDUCATION

Indian Institute of Technology, Jodhpur

Aug 2024 – May 2028

B.Tech. - Computer Science and Engineering - CGPA - 9.40/10

Jodhpur, Rajasthan

TECHNICAL SKILLS

Languages: C++, C, Python, SQL, Bash

Systems & Infra: Linux, Git, Docker, AWS (S3), Kafka, Concurrency, Distributed Systems, Compilers (Flex, Bison)

Web & Backend: Django, FastAPI, PostgreSQL, REST APIs, React, TypeScript, Tailwind CSS, pytest, Vitest

Concepts: Data Structures, Algorithms, OOP, System Design, Operating Systems, Testing, SDLC, CI/CD

ML & Data: PyTorch, TensorFlow, NumPy, Pandas, Statistical Analysis, Time-Series Analysis

PROJECTS

WEAVE-DB: SQL Version Control | [GitHub](#) | Django, FastAPI, PostgreSQL, Kafka, AWS Jan 2026 - Apr 2026

- Led the **Django + FastAPI** backend for a **4-member team** building a **Git-like version control system** for SQL databases, owning **ORM models**, the **atomic commit service**, and encrypted storage of user-supplied DB credentials.
- Engineered a **bidirectional rollback engine** guaranteeing **zero DB corruption** under concurrent, multi-user **PostgreSQL** workloads, consuming **Kafka-ordered commit events** for deterministic commit sequencing and selecting the nearest snapshot before or after the target version to cut worst-case replay range by **50%** ($K-1$ to $\lfloor K/2 \rfloor$).
- Integrated the **React + TypeScript** client with the **FastAPI REST** layer and validated the system with **581 automated tests** spanning unit, integration, and end-to-end paths using **pytest** and **Vitest**.

SimRUN: Discrete-Event Simulator | [GitHub](#) | C++, STL, Discrete Event Simulation Dec 2025 - Apr 2026

- Built a **discrete-event simulator** in C++ for distributed microservice architectures, with a **priority-queue scheduler** executing timestamp-ordered events across concurrent service topologies.
- Implemented the **custom DSL** front end (lexer, parser, semantic validation) lowering topology definitions to a **flat numeric IR**, rejecting malformed service graphs before simulation.
- Modeled caches, databases, load balancers, and circuit breakers via an **orthogonal 20-opcode set** with **O(1) event dispatch**, supporting cancellation, scatter-gather fan-out, and preemptive eviction.

ONITRO: SIMD Vectorized Numerics Library | [GitHub](#) | C++20, AVX2, nanobind June 2026 - Present

- Engineered a **branch-free, allocation-free** options-pricing kernel in **C++20** using hand-written **AVX2 intrinsics** (`<immintrin.h>`) over a **struct-of-arrays** layout, processing **4 doubles/instruction** and validated against `py_vollib`.
- Built a **vectorized root-finding solver** (Newton-Raphson + Brent fallback) handling **per-lane divergent convergence** via SIMD masking rather than scalar fallback, exposed through **nanobind**.

EXPERIENCE

Team Member – Quant Team

Oct 2025 - Dec 2025

Inter IIT Tech Meet 14.0

IIT Jodhpur

- Developed algorithmic trading strategies for a **high-frequency, multi-feature time-series** problem by Ebullient Securities, analyzing **400+ masked features** to extract predictive signals and building custom moving averages and **denoising pipelines** for second-level price series.
- Backtested **regime-based strategies** with custom indicators across multiple market regimes, achieving **over 40% returns against a 20% market benchmark** with a **Calmar ratio of 14.4**.

Undergraduate Student Researcher

Aug 2025 - Nov 2025

Dept. of CSE, IIT Jodhpur (Supervisor: Dr. Mayank Vatsa)

Jodhpur, Rajasthan

- Built a benchmark dataset for a **text-to-image generation** project targeting count accuracy, spatial relationships, and visual attribute fidelity, evaluated against **10 existing T2I datasets**.
- Curated a **1M-prompt dataset** spanning **10 object categories** and **4 complexity levels**, and ran controlled image-generation experiments to assess robustness and failure modes across challenging compositional scenarios.

COURSEWORK

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|--------------------------------------|----------------------------------|----------------------------------|
| • Data Structures and Algorithms (A) | • Intro to Computer Science (A*) | • Probability and Statistics (A) |
| • Machine Learning (A) | • Software Engineering (A-) | • Mathematics for Computing (A-) |

ACHIEVEMENTS

- Ranked **8th among 23 IITs** in the Quant Problem Statement of Inter IIT Tech Meet 14.0.
- Secured All India Ranks of **2126** in JEE Main 2024 and **2720** in JEE Advanced 2024.

LEADERSHIP & CAMPUS INVOLVEMENT

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| • Coordinator , Quant Club, IIT Jodhpur | Aug 2026 - Present |
| • Core Member , DevUp Labs, IIT Jodhpur | Apr 2026 - Present |
| • Executive , CSE Department, IIT Jodhpur | Aug 2025 - Present |