

Aditya Pandey

RUST SYSTEMS ENGINEER

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Education

IIT(ISM) Dhanbad

B.TECH. (HONORS), COMPUTER SCIENCE AND ENGINEERING

• CGPA: 8.23/10

India

July. 2015 - May. 2019

Work Experience

Independent

SYSTEMS ENGINEER

Remote

Nov. 2025 - Present

- Active contributor to reth and Tempo execution clients — transaction pool and payload builder performance optimizations. [paradigmxyz/reth](#), [tempoxyz/tempo](#)
- Contract systems engineering for a stealth AI infrastructure startup.

Xplode

RUST ENGINEER

Dubai, UAE

May. 2025 - Oct. 2025

- Built a real-time game engine in Rust on Solana — cell-locking mechanics for deterministic concurrent state transitions, sustaining **500+ concurrent players** at consistent **12ms interaction latency** — validated across **100,000+ gameplays** in production.
- Engineered **Ephemeral Rollups** (10ms block time) to commit every player move on-chain — enabling trustless dispute resolution and agentic gameplay without sacrificing real-time responsiveness. [playxplode.xyz](#), [github.com/xplodegame/xplode-engine](#)

Scroll

SENIOR PROTOCOL ENGINEER

Remote

Aug. 2024 - Mar. 2025

- Engineered **sbv-cli**, a Rust stateless block verifier for Scroll L2 — supports single-shot, chunked, and continuous RPC verification modes with configurable worker concurrency.
- Built a parallel witness extraction pipeline over RPC: block-level task parallelism with configurable ancestor depth and dual serialization output (JSON and rkyv).
- Achieved **3.3× historical sync throughput** (30 → 100 Mgas/s) by redesigning the state trie to defer hash computation until commit time — eliminating redundant hash passes over intermediate nodes and cutting I/O pressure during bulk state ingestion.
- Prototyped a **concurrent proof aggregation pipeline**: parallel SP1 proof generation across L2 blocks, fan-in aggregation into a single compressed proof, and recursive on-chain verification — consolidating N block proofs into one, significantly reducing on-chain verification cost.

Coinswitch

SENIOR SOFTWARE ENGINEER

Bangalore, India

April. 2023 - June. 2024

- Engineered a production **{2,3}-MPC wallet** in Rust — distributed key generation with threshold signing, three-party async protocol deployed across isolated AWS Nitro Enclaves, reducing custodial attack surface compared to a single-key model for \$500M+ in assets.
- Designed a multi-chain staking system (Solana, Cardano, Near, EVM) serving **20M+ users** at **4.5M+ daily transactions** and **99.98% uptime** — horizontally scaled with per-chain gas optimization to sustain throughput across heterogeneous confirmation models.

Jpex Finance

FOUNDER

Dubai, UAE

May. 2022 - Jan. 2023

- **Winner, EthGlobal Hackmoney 2022** — built and shipped an NFT options trading platform end-to-end: Solidity contracts for option minting and settlement with proxy upgrade patterns, Svelte frontend, and integrations with NFT lending protocols for on-chain collateral. [Live Demo](#), [github.com/i-m-aditya/jpex-contracts](#)

Headout

SOFTWARE ENGINEER

Bangalore, India

June 2019 - Feb 2022

- Built a reactive booking microservice in Kotlin/Vert.x handling high-volume vendor plugin requests — event-driven, nonblocking I/O with Kafka for inter-service messaging, sustaining throughput under bursty booking/cancellation load with built-in backpressure and horizontal scaling.
- Tech-stack: **Kotlin, Java, Springboot, Vert.x, Kafka, Docker, AWS**

Opensource Contributions

Reth

RUST STORAGE AND EXECUTION ENGINE · PARADIGM

- **40+ merged PRs** to reth — a production Rust storage and execution engine with a ~663 GB full-node / 1.7 TB archive MDBX-backed database and staged sync pipeline. Contributions span **spare trie I/O optimization** (reducing redundant hash computation over intermediate nodes), **engine tree throughput** (execution pipeline scheduling and parallelism), and correctness fixes across sync and execution stages. *Contributions:* [paradigmxyz/reth/pulls/i-m-aditya](#)
- Built a profiling-capable AWS deployment for reth: provisions **im4gn** NVMe-backed spot instances, compiles reth with **jemalloc-prof** in the background, hot-swaps the binary into the running container, and exposes **samply** CPU + **pptest** heap endpoints — used for local perf investigation before submitting upstream. [i-m-aditya/reth-deploy](#)

Tempo

HIGH-THROUGHPUT PAYMENTS BLOCKCHAIN · RETH-BASED EXECUTION CLIENT

- Profiling-driven contributions to Tempo's transaction pool and payload builder — diagnosing write path lock contention, prewarm pipeline inefficiencies, and pool maintenance hot paths that surface only under production transaction throughput. *Contributions:* [tempoxyz/tempo/pulls/i-m-aditya](https://github.com/tempoxyz/tempo/pulls/i-m-aditya)

Tendermint-rs

RUST BFT CONSENSUS IMPLEMENTATION

- Performance optimizations to the Rust Tendermint consensus client. *Contributions:* [informalsystems/tendermint-rs/pulls/i-m-aditya](https://github.com/informalsystems/tendermint-rs/pulls/i-m-aditya)

Succinct Labs (SP1)

ZERO-KNOWLEDGE PROVING STACK

- Optimized the Tendermint ZK light client: introduced early-exit signature verification (fetch top validators until 2/3 voting-power threshold, discard the rest), eliminating redundant BFT quorum work from the proving hot path. *Contributions:* [succinctlabs/sp1/pulls/i-m-aditya](https://github.com/succinctlabs/sp1/pulls/i-m-aditya)

Foundry

BLAZINGLY FAST ETHEREUM DEVELOPMENT TOOLKIT

- Bug fixes and tooling improvements across core Foundry tooling. *Contributions:* [foundry-rs/foundry/pulls/i-m-aditya](https://github.com/foundry-rs/foundry/pulls/i-m-aditya)

Other Contributions

BACKPACK · EVM GAS OPTIMIZATIONS

- *Also contributed to:* **Backpack (Solana)**, **EVM Gas Optimizations**.

Projects

Tiny-LSM - Log-Structured Merge Tree

RUST, STORAGE SYSTEMS, CONCURRENCY

- Built a production-grade LSM storage engine from scratch — the architecture behind RocksDB, LevelDB, and Cassandra. Implemented skip-list memtables, WAL for crash recovery, block-encoded SSTables with bloom filters, multi-way merge iterators, tiered/leveled compaction strategies, and MVCC for snapshot isolation.
- Extended with time-window compaction for time-series workloads, tiered storage with automatic hot/cold migration, and SIMD-accelerated block decoding to reduce read amplification on range scans. github.com/i-m-aditya/tiny-lsm

XAlloc - Custom Memory Allocator

RUST, UNSAFE, CONCURRENCY

- Built a thread-local memory allocator from scratch with size-class segregation and lock-free fast paths, achieving **2.7× throughput over system malloc at 8 threads** — latency remains flat under contention where the system allocator degrades super-linearly, through careful cache-line alignment and avoiding atomics on the fast path. github.com/i-m-aditya/xalloc

Scroll-Reth

RUST, ETHEREUM

- Built a follower node on the modular reth execution stack: wired alloy's RPC layer into reth's staged sync pipeline to participate in the p2p network without running consensus, validating reth's storage abstraction boundaries under a non-standard execution topology. github.com/i-m-aditya/scroll-reth

BitTorrent Client

RUST, NETWORK PROTOCOLS

- A concurrent BitTorrent client built from scratch in Rust — handles **.torrent** parsing, tracker-based and DHT peer discovery, and parallel piece-wise downloading with SHA1 integrity verification across concurrent peer connections, without relying on external libraries. github.com/i-m-aditya/bittorrent-rust

Other Projects

RUST, SOLANA, SOLIDITY

- *Also built:* **VerseFi** — generalized conditional token system on Solana (Colosseum Hackathon); **Pegbet** — on-chain speculation on pegged asset deviations.

Technical Skills

LANGUAGES

- Rust · C++ · Go · TypeScript · Python · Solidity · Kotlin · Java

SYSTEMS & CONCURRENCY

- Tokio · async/unsafe Rust · lock-free data structures · SIMD · memory allocators · MDBX · libp2p · alloy-rs · jemalloc

STORAGE & DISTRIBUTED SYSTEMS

- LSM trees · WAL · MVCC · bloom filters · compaction strategies · BFT consensus · P2P networking · Kafka · EVM · ZK proof systems (SP1)

INFRASTRUCTURE & OBSERVABILITY

- AWS (Nitro Enclaves · EC2 · IAM) · Terraform · Docker · Kubernetes · GCP · Prometheus · Grafana · pprof · samplify · Criterion

WEB & BACKEND

- Node.js · Nest.js · Spring-boot · Vert.x · React · Svelte · Next.js · Django

Competitive Coding

Codeforces Expert – Max Rating: 1747

COMPETITIVE PROGRAMMING

CODEFORCES USERNAME: *v_for_vendatta*