

M SESA SAI VAMSI

LinkedIn vamsi.027.11@gmail.com +91 7550027299 GitHub

EDUCATION

Vellore Institute of Technology
B.Tech in Computer Science and Engineering

Chennai, Tamil Nadu
Sept 2021 – July 2025

EXPERIENCE

Backend & Blockchain Engineer
GlueX Protocol

Jan 2025 – Feb 2026

– DeFi Yield Service Infrastructure

- * Built and owned a yield aggregation engine spanning 35+ DeFi protocols, normalizing emissions, compounding schedules, reward inflation, utilization-based rate curves, and liquidity incentives into unified diluted APY, reward APY, borrow APY, and TVL metrics.
- * Integrated CPAMM and CLAMM liquidity modules with swap functionalities and yield modeling including reserve dynamics, fee accrual, swap volume projections, tick-level liquidity concentration, and emission decay.
- * Architected and deployed scalable AWS workloads (Lambda and EC2) supporting horizontal scaling, event-driven execution, and zero-downtime releases, with production-grade observability using structured JSON logs, CloudWatch metrics (p50–p99), dashboards, health checks, and alerts..
- * Designed a low-latency multi-database architecture using DynamoDB (GSI-driven access) and Amazon Timestream, leveraging async I/O, batch writes, and cache-first query paths.

– CoW Protocol Solver (Batch Auction Execution)

- * Contributed to batch auction settlement logic operating under strict 10–12 second block constraints, optimizing routing, liquidity traversal, and execution ordering before submission.
- * Implemented pre-settlement simulation detecting slippage violations, liquidity exhaustion, revert scenarios, and deadline breaches prior to on-chain settlement.
- * Integrated MEV-aware execution paths via private transaction builders and replay-safe ordering to reduce reverts.

– Python Backend Architecture

- * Owned and shipped a production-grade async Python backend using FastAPI and asyncio, designing a greenfield async-first architecture enabling parallel execution, background tasks, and non-blocking I/O while handling thousands of concurrent requests with sub-10ms cached latency.
- * Designed a high-performance multi-tier caching layer (8 specialized TTL/LRU caches), achieving 37.5% codebase reduction and 40% lower lock contention with consistently low tail latencies.
- * Built fault-tolerant batch processing pipelines with deadlines, retries, timeout awareness, and per-task isolation, reliably processing 2000+ entities without cascading failures.
- * Engineered async RPC orchestration layer coordinating hundreds of EVM calls per cycle using multicall batching, retry isolation, and rate-limit-aware scheduling.

SDE Intern

Nov 2023 – Jan 2024

Olive Technologies, Hyderabad

- Contributed to the development of an internal inventory management platform using **React**, building UI components and improving overall application functionality.
- Prototyped a mobile stock management application using **React Native** to explore mobile-first workflows for inventory operations.
- Built and maintained RESTful APIs using **Node.js**, delivering structured data with sub-300ms response times across datasets of over 4700 records.
- Investigated and resolved production runtime issues including cold starts and execution time limits, ensuring stable deployments and consistent application uptime.

PROJECTS

Cross-Chain ERC20 Bridge | *Solidity, Node.js, Hardhat, Ethers.js*

Code

- Implemented a bidirectional ERC20 bridge using lock–mint and burn–release semantics, coordinating state across two chains via on-chain events, off-chain message construction, and destination-chain execution.
- Designed a validator-signed cross-chain authorization scheme using ECDSA with chainId + contract-address domain separation and monotonic nonces to prevent replay, cross-chain, and cross-contract signature reuse.
- Built an event-driven relay pipeline that subscribes to Solidity events, deterministically reconstructs signed payloads, and submits authenticated transactions using role-isolated validator and relay keys.
- Developed end-to-end Hardhat tests without mocks simulating the full bridge lifecycle, validating signature recovery, nonce enforcement, role permissions, and balance conservation across chains.

Transaction Verification and Monitoring System | *Python, Fast API, WebSockets*

Code

- Built a blockchain transaction verification system using FastAPI, combining Merkle proof generation and multi-signature verification with a unified off-chain and on-chain verification flow.
- Designed and deployed Solidity smart contracts for an on-chain verification registry, implementing batch verification to reduce gas costs versus per-transaction validation.
- Implemented real-time blockchain monitoring using WebSocket-based event subscriptions and async Python, enabling low-latency detection and processing of on-chain activity.
- Developed a cryptographic verification pipeline using keccak256-based Merkle trees with sorted-pair optimization and efficient proof construction for transaction inclusion guarantees.

Smart Contract for CLAMM Tick collector | *Solidity, EVM*

Code

- Built a unified tick data collection system supporting singleton CLAMM protocols such as Uniswap V4 and PancakeSwap Infinity, abstracting pool state, slot0, tick bitmaps, and liquidity reads behind a common interface.
- Implemented gas-optimized bitmap scanning and word-level iteration to efficiently discover initialized ticks across entire pools and in price-local regions around the current tick.
- Engineered direction-aware, gas-bounded tick traversal with precise handling of tick spacing, compressed ticks, word boundaries, and current-tick edge cases.
- Applied Q96 fixed-point arithmetic, low-level bitwise math, and selective inline assembly to accurately profile liquidity for routing, arbitrage, and execution simulation use cases.

PUBLICATIONS

A Physics-Informed Computer Vision Framework for Firefighting Assistance

2025

IEEE 9th International Conference on Information and Communication Technology (ICT), Chennai, India **IEEE Xplore Link**

TECHNICAL SKILLS

- **Languages:** Python, TypeScript, JavaScript, C++, Solidity
- **Backend and Systems:** FastAPI, Django, Flask, Node.js, Express.js, REST APIs, Async Programming, Pandas, NumPy
- **Cloud and Infrastructure:** AWS (EC2, Lambda, DynamoDB), Serverless Architectures, CloudWatch
- **Databases:** PostgreSQL, MongoDB, MySQL, DynamoDB, Prisma
- **Blockchain and DeFi Engineering:** Ethers.js, web3.py, Hardhat, Foundry, ERC-20 and ERC-4626, CPAMM, CLAMM, On-chain and Off-chain Integration, Execution Simulation, Fixed-point Arithmetic
- **Frontend:** React, React Native, Redux, Tailwind CSS