

MESA SARAH VASANTHA ZEPHYR

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SUMMARY

Software Developer with expertise in AI-powered and full-stack application development using React, Next.js, Node.js, and Python. Experienced in designing scalable RESTful APIs, integrating LLM-based features, optimizing performance, implementing distributed caching, and building secure, production-ready applications.

PROFESSIONAL EXPERIENCE

Generative AI Intern | Tata Consultancy Services (TCS) | Hyderabad ([Github](#)) ([Live](#)) Feb 2025 - Apr 2025

- Architected and shipped 6+ production-grade REST APIs powering document processing and semantic search for an enterprise-facing platform, achieving 85%+ test coverage and seamless CI/CD integration.
- Re-engineered database query and indexing strategy to cut retrieval latency by 70% across a corpus of 10,000+ enterprise documents, directly improving response times for downstream search features.
- Designed and integrated a hybrid search architecture combining Neo4j knowledge graphs with Apache Solr for more accurate semantic retrieval; collaborated cross-functionally within Agile/JIRA sprints, contributing to sprint planning and code reviews.
- Partnered with senior engineers to debug and optimize production pipelines, helping deliver a stable, scalable document intelligence platform adopted across teams.

Tech: Python, FastAPI, Neo4j, Apache Solr, CI/CD, Jira

Project Intern | Defence Research & Development Organisation (DRDO) | Hyderabad ([Github](#)) ([Live](#)) Sep 2023 - Nov 2023

- Designed and built an end-to-end offline Retrieval-Augmented Generation (RAG) pipeline — spanning PDF ingestion, Tesseract OCR, embedding generation, ChromaDB vector storage, and LLM-based response generation — deployed for 100+ R&D personnel in a fully air-gapped, security-sensitive environment.
- Improved OCR text-extraction accuracy from 60% to 85-90% by engineering custom preprocessing and intelligent chunking strategies, significantly boosting downstream retrieval quality.
- Maintained zero production downtime while iterating on the pipeline, ensuring reliable access to document intelligence tools for researchers operating without internet connectivity.
- Collaborated with defense research teams to translate operational requirements into a secure, offline-first AI system architecture.

Tech: Python, Tesseract OCR, ChromaDB, LLMs

KEY PROJECTS

Atlas AI — Autonomous AI Agent Orchestration Platform — ([Github](#)) ([Live](#))

- Engineered an autonomous AI agent platform that converts natural-language goals into executable, multi-step workflows using Groq-hosted Llama 3 for automated task planning.
- Designed a DAG execution engine supporting parallel task scheduling with automatic retry and recovery on failure, plus a human-in-the-loop approval system for high-risk actions.
- Built a live WebSocket execution timeline and visual workflow builder; containerized the full stack with Docker Compose for one-command deployment.

Tech: Next.js 15, FastAPI, PostgreSQL, Groq (Llama 3), WebSockets, Docker

LoadGhost — Generated Load Testing from Real User Behavior ([Github](#)) ([Live](#))

- Built a platform that transforms real application traffic — Nginx/Apache logs, HAR files, and analytics exports — into production-ready load tests.
- Developed an automatic user-journey discovery engine clustering real user sessions into explorable flow graphs, with script generation for k6, Locust, JMeter, Artillery, and Playwright.
- Built a live performance dashboard with AI-powered insights (Gemini); architected background processing with Celery/Redis and vector search via pgvector.

Tech: Next.js 15, FastAPI, PostgreSQL (pgvector), Celery, Redis, Gemini

SKILLS

Languages & Frameworks: Python, Java, JavaScript, TypeScript, SQL, React.js, Next.js, FastAPI, Flask, Node.js, REST APIs

AI / ML: LangChain, RAG, LLMs, TensorFlow, PyTorch, Scikit-learn, NLP, Computer Vision, Prompt Engineering

Databases & Tools: PostgreSQL, MySQL, MongoDB, Neo4j, ChromaDB, Docker, Git, CI/CD, Jira

Certifications: CS50 Intro to CS (HarvardX), CS50 Web Programming (HarvardX), IBM Full Stack Software Developer

ACHIEVEMENTS

Research Paper (Institution of Engineers (India), 2025) • **Meta Hackathon Finalist** (2026) • **MATHack 2.0 Finalist** (2024)

EDUCATION

Bachelor of Technology, Computer Science Engineering | Vellore Institute of Technology, Amaravati