Vikalp Mishra

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Summary

Full-Stack Software Engineer with 2.5+ years of experience in high-performance backend systems, simulation platforms, and CI/CD infrastructure. India Lead for Boeing's Quality Dashboard, overseeing architecture for tools used by 20+ engineering teams. Expertise in Python, Rust, and React, with a deep background in AST-based compilers and machine learning applications in medical imaging.

Experience

- **Boeing** — Bengaluru, India
  Software Engineer — *Mar 2023 – Present*
  - **Quality Platform & Dashboard (Full-Stack)**: Spearheaded the India SQE Dashboard initiative, owning architecture and execution. Built a pipeline verification engine using **FastAPI** and **Redis** that analyzed 20k+ CI pipelines to detect DAG deviations, reducing manual SQE review effort by 60%. Designed a responsive **React** dashboard with audit-ready exports, maintaining <200ms API latency.
  - **SCE Converter (Compiler Engineering)**: Architected an AST-based Domain Specific Language (DSL) converter using **Lark** to transform legacy .sce files into Python scripts. Implemented **LRU caching** to optimize repeated scenario transformations, significantly reducing script maintenance complexity and overhead.
  - **BSim Simulation Platform**: **Constructed** core engine components for a safety-critical simulation system. Implemented a high-throughput Recorder (15MB/min) and a Playback system with event-aligned replay under **10ms latency**. **Orchestrated** a regulated Nightly/RC/Stable release flow using GitLab CI/CD.
  - **Distributed Simulation (DIS)**: Owned the DIS integration layer handling 300+ PDUs/sec under a 40ms latency budget. Designed deterministic serialization pipelines for Fire and Entity State PDUs, ensuring byte-alignment and endian-correctness across 50Hz simulation ticks.
  - **Skills**: Python, Rust, FastAPI, Redis, React, GitLab CI/CD, Distributed Systems, Lark, AST, Release Engineering
- **Cognizant** — Bengaluru, India
  Programmer Analyst — *Jun 2022 – Feb 2023*
  - **Data Analytics Pipelines**: **Formulated** Python-based ETL and predictive analytics pipelines, achieving a **25% reduction in runtimes**. **Synthesized** data validation workflows for client reporting systems to ensure 99.9% data integrity.
  - **Skills**: Python, ETL, Predictive Analytics, Data Validation, SQL, Pandas

Projects

- **Brain Tumor Segmentation & Survival Prediction**
  Deep Learning, TensorFlow, Scikit-Learn, Pandas
  - **Medical Imaging ML**: **Derived** a **constructed** 3D segmentation system using the **BraTS Dataset** to isolate brain tumors from healthy tissue in MRI scans. Implemented predictive models to estimate patient survival rates based on radiomic characteristics and tumor morphology.
  - **Skills**: Deep Learning, TensorFlow, Scikit-Learn, Pandas, Medical Imaging, Data Science
- **ZenBox – Full-Stack Email Archiving System**
  Python, FastAPI, React, PostgreSQL, Redis
  - **System Design**: Built a scalable system processing 20k emails with 90% classification accuracy. **Executed** ingestion services (300 emails/min) and a React dashboard for advanced search and bulk operations.
  - **Skills**: Python, FastAPI, React, PostgreSQL, Redis, System Design, REST APIs

Skills

Languages: Python, Rust, C++, SQL, JavaScript, TypeScript, Bash
Backend/Distributed: FastAPI, Actix Web, Node.js, Distributed Systems, Redis, AST/Compilers, PostgreSQL, MySQL
Frontend/Visualization: React, Redux, HTML5/CSS3, CesiumJS, Data Visualization, D3.js
Cloud/DevOps: AWS, Docker, Kubernetes, GitLab CI/CD, Terraform, Release Engineering, MkDocs
AI/ML: TensorFlow, Scikit-Learn, Deep Learning, Predictive Analytics, Pandas
Practices: System Design, Performance Optimization, TDD, DO-178C, DO-330, Agile

Education

- **Veer Surendra Sai University of Technology (VSSUT)** — Burla, India
  Bachelor of Technology in Electronics & Telecommunication — *Aug 2018 – May 2022*