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# Vikalp Mishra

## Full-Stack Software Engineer

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### SKILLS

**Languages:** Rust, Python, C++, C, JavaScript/TypeScript, SQL, Bash

**Backend/Distributed:** FastAPI, Actix Web (Rust), Tokio, Redis, PostgreSQL, gRPC, Distributed Systems, Raft

**Systems Programming:** C/C++ (simulation models, DIS protocol), Rust (safety-critical systems), Real-time Systems

**Frontend:** React, Redux, TypeScript, Next.js, TailwindCSS

**DevOps/Cloud:** Docker, Kubernetes, GitLab CI/CD, AWS (EC2, S3, RDS), Terraform

**ML/Data:** TensorFlow, Scikit-Learn, Pandas, NumPy

**Domain Expertise:** Performance Optimization, AST/Compilers, DO-178C/DO-330, Safety-Critical Systems, Network Protocols

### EXPERIENCE

#### Boeing, Bengaluru, India - Software Engineer

Mar 2023 – Present

- **Quality Platform & Pipeline Verification Engine:** Architected FastAPI + Redis verification engine analyzing 20k+ CI/CD pipelines across 20 engineering teams, reducing SQE review time by 60% through automated DAG deviation detection.
- Designed React dashboard with audit-ready exports serving 500+ daily users with <200ms p99 latency via PostgreSQL query optimization and Redis caching.
- **BSim Safety-Critical Simulation Platform:** Built high-throughput data recorder processing 15MB/min of telemetry with event-aligned playback achieving <10ms latency, enabling deterministic replay for DO-178C certification.
- Orchestrated regulated release pipeline (Nightly/RC/Stable) via GitLab CI/CD, reducing deployment time from 4 hours to 30 minutes through parallelization.
- **Distributed Interactive Simulation (DIS) Integration:** Designed DIS protocol layer in C++/Rust handling 300+ PDUs/sec with <40ms latency by implementing zero-copy serialization and lock-free queues for Entity State and Fire PDUs.
- **Domain-Specific Language Compiler:** Developed AST-based DSL converter using Lark parser, transforming 5000+ legacy .sce files into Python scripts, reducing maintenance overhead by 40%.

#### Cognizant, Bengaluru, India - Programmer Analyst

Jun 2022 – Feb 2023

- Engineered Python ETL pipelines processing 1M+ records/day, achieving 25% runtime reduction through vectorized operations (Pandas/NumPy) and parallel processing.
- Implemented data validation workflows ensuring 99.9% data integrity for financial reporting systems serving 50+ enterprise clients.

### EDUCATION

#### VSSUT, Burla, India - B.Tech in Electronics & Telecommunication

Aug 2018 – May 2022

### PROJECTS

#### RaftKV – Distributed Key-Value Store

Status: In Development

- Implementing Raft consensus algorithm (leader election, log replication, safety guarantees) in 3000+ LOC Rust.
- Target: 10k writes/sec with <5ms p99 latency via lock-free data structures and async I/O (Tokio).

#### ZenBox – Email Archiving System

- Built scalable email processing system ingesting 300 emails/min with 90% classification accuracy using TF-IDF + Naive Bayes.
- Optimized PostgreSQL queries achieving <100ms search latency on full-text search via GIN indexes.

#### BrainSeg – Medical Imaging ML

- Trained 3D U-Net on BraTS dataset for brain tumor segmentation achieving 0.85 Dice coefficient on test set.