

# SUSHIL KOIRALA

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## ABOUT ME

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Full-stack Engineer with 3 years of experience in Python, React, Django, FastAPI, LLMs, and AWS DevOps. Skilled in building and maintaining scalable applications within Agile Scrum environments. A perfectionist, strong team player, and dedicated problem solver with a special interest in mathematics and the application of analytical thinking to complex technical challenges.

## EDUCATION

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### Bachelor's degree in Computer Engineering

2017 - 2022

*Western Regional Campus, Pokhara, Nepal*

- **Major Project:** Built an RNN-based model to detect plant diseases from leaf images. Included data set pre-processing, model training, and evaluation, resulting in accurate automated disease classification.
- **Minor Project:** Built an app that helps deaf and blind users ask for directions using icon-based inputs and audio cues.

### Higher Secondary Education (+2)

2015 - 2017

*Aroma Higher Secondary School, Chitwan, Nepal*

## TECHNICAL SKILLS

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- **Languages:** Python, Javascript
- **Web Development:** Django, Django REST Framework, FastAPI, React
- **Databases:** PostgreSQL, PostGIS, Neo4j, MongoDB, Kafka, Debezium
- **ML/AI Frameworks:** GenAI, LangChain, LangGraph, LangSmith, RAG, OpenCV
- **Cloud Services:** AWS Lambda, AWS S3, AWS ECS/EC2, Shell Scripting, CI/CD

## PROFESSIONAL EXPERIENCE

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### Senior Backend Engineer

Aug 2025 - Present

*Youth Innovation Lab, Kathmandu, Nepal*

- Led the successful upgrade of a large-scale Django project from 1.11.x to 5.x, modernizing deprecated modules, refactoring legacy code, and ensuring full backward compatibility.
- Optimized ORM and SQL queries, reducing response times by up to 100x.
- Designed and improved GIS workflows, including spatial indexing, geometry optimizations, and map-related data processing.
- Developed and maintained RESTful APIs using Django and Django REST Framework, focusing on clean architecture and performance.
- Built interactive, map-driven frontends using React, MapLibre/Leaflet, and custom UI components for dynamic GIS visualization
- Led the design and development of the entire backend architecture for an HR Management System.

## Backend Engineer

May 2023 - Apr 2025

NAXA, Kathmandu, Nepal

- Integrated Debezium with PostgreSQL and Kafka to stream row-level changes from 50+ tables for real-time sync across multiple databases (MongoDB, Neo4j, Elasticsearch).
- Used Grafana with Prometheus to monitor APIs.
- Implemented high-performance bulk data upload and export capabilities, supporting files with over 500,000+ rows.
- Integrated Neo4j graph database to manage 1200+ active users and enforce object-level permissions with fine-grained control.
- Built and deployed a FastAPI-based microservice using WebSockets and Redis to stream real-time progress of Celery tasks.
- Integrated Jenkins CI/CD pipeline with Sentry to track deployments and monitor/notify post-release errors.
- Deployed multiple services on AWS EC2 with Elastic Load Balancer for load balancing, autoscaling and avoiding downtime.
- Implemented a serverless PDF generation system using Selenium on AWS Lambda to reduce infrastructure costs.
- Optimized and refactored database queries (both ORM and raw SQL), achieving up to 80x improvement in response times.
- Developed and executed raw Postgis queries with geometry functions to enable advanced map-based data visualizations.
- Streamlined the deployment process using Docker, Git-based CI/CD pipelines, and AWS ECS (Elastic Container Service).
- Utilized Amazon S3 to store high-resolution images, implementing lifecycle policies for automated periodic cleanup.
- Developed custom PostgreSQL functions tailored to meet specific client requirements and business logic.
- Integrated Stripe for secure payment processing, supporting multi-tiered subscriptions.
- Implemented Apple Single Sign-On (SSO) for seamless authentication on both mobile and web platforms.

## ACADEMIC & RESEARCH PROJECTS

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### **BIPAD Portal (Disaster Analysis)**

- Nepal's national disaster-information management system, integrating hazard, risk, loss and real-time data across federal, provincial and municipal levels to support preparedness, early warning, response and post-disaster planning

### **StockIT (Stock Market Analysis)**

- A NEPSE data pipeline enabling real-time tracking and natural language insights using LLMs and Retrieval-Augmented Generation (RAG).

### **ZITE (Project Management System)**

- Mobile app for data collection and task management sync with a web-based platform for analysis and reporting to turn field data into actionable insights.

## INTERPERSONAL SKILLS

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- **Core Strengths:** Analytical mindset, effective problem-solving, adaptability, attention to detail, and a perfectionist approach to delivering high-quality work.
- **Communication:** Clear and confident communicator with strong writing skills.
- **Leadership:** Skilled in guiding trainees and contributing to project direction through hands-on technical leadership.