Joseph T Maina

Full Stack GIS Developer

josephthuha@gmail.com (254) 792127575 Nairobi, Kenya https://www.linkedin.com/in/josephthuha/

PROFILE

Full Stack **Geospatial Software Engineer** with 4+ years of experience designing, building, and operating **production-grade Web-GIS platforms** and spatial data pipelines. Strong background in **backend API development, PostGIS-based spatial systems, GeoServer/GeoNode ecosystems**, and cloud-deployed GIS applications. Experienced in handling large raster and vector datasets, optimizing spatial queries, and delivering scalable, secure geospatial systems used in real operational environments. Comfortable working end-to-end across GIS, backend, and infrastructure layers in engineering-first teams.

PROFESSIONAL EXPERIENCE

United Nations Development Programme (UNDP), *GIS Developer* 01/2022 – 12/2025 | New York, NY/Remote

- Core contributor to **GeoHub**, an open-source production-grade cloud-based geospatial platform delivering SDG analytics and decision-support services across multiple regions.
- Designed and implemented **scalable spatial ETL pipelines** for ingesting, validating, transforming, and publishing large geospatial datasets using **Python and PostGIS**.
- Led the redesign of a major spatial data processing pipeline (Data Futures Exchange), **improving processing performance by ~60%** and increasing data reliability.
- Built and maintained **backend GIS APIs** using **FastAPI/Django**, integrating spatial databases, raster services, and cloud-native components.
- Implemented **dynamic raster tile services using TiTiler**, enabling efficient serving of large raster datasets in Web-GIS applications.
- Designed and operated **cloud-based data pipelines on Azure**, leveraging **Blob Storage, Azure Synapse Analytics, and Microsoft Spark Utilities** for large-scale geospatial processing.
- Implemented **queue- and message-based ingestion workflows** to support asynchronous data processing, validation, and transformation pipelines.
- Developed interactive **Web-GIS interfaces** using **Mapbox and MapLibre**, consuming backend APIs and spatial services.
- Optimized **spatial queries, indexing strategies, and data access patterns**, improving performance and stability of geospatial services in production.
- Collaborated with distributed engineering and analytics teams, authored technical documentation, and supported CI/CD-driven deployments.

GoalSpatial LTD, *Co-Founder and Chief Technology Officer* 01/2022 – 07/2024 | Nairobi, Kenya

- Co-founded a geospatial technology company delivering **custom Web-GIS platforms and spatial data systems**.
- Led **end-to-end development of full-stack GIS applications**, spanning backend APIs, **PostGIS databases**, GeoNode/GeoServer-based services, and web-based mapping interfaces.
- Designed and implemented **GeoNode-based GIS platforms**, including layer publishing, metadata management, permissions, and exposure of **GeoServer WMS/WFS/WMTS/XYZ services**.
- Built and maintained **backend services using Python and Django**, supporting spatial analysis, data ingestion, and reporting workflows.
- Architected and implemented **PostGIS-backed spatial data pipelines**, including schema design, spatial indexing (GiST/SP-GiST), and query performance optimization.
- Developed web-based GIS applications using **Leaflet and MapLibre** for visualization and interaction with large raster and vector datasets.
- Deployed and maintained GIS systems using **Docker and cloud infrastructure**, ensuring scalability, security, and operational reliability.
- Defined technical standards, system architecture, and development workflows.
- Led and mentored developers and GIS analysts, providing architectural guidance and code reviews.
- Worked directly with clients to translate domain and operational requirements into robust, production-ready geospatial systems.

Kenya Red Cross Society, *GIS & Data Operations Volunteer (Disaster Response)* 01/2018 – 12/2021 | Nairobi, Kenya

- Supported disaster response operations through **GIS mapping and spatial data digitization**.
- Digitized flood-, fire-, and emergency-affected areas using satellite imagery and base datasets to support response planning.
- Produced spatial datasets and maps under **time-sensitive conditions**, ensuring accuracy and consistency.
- Collaborated with humanitarian teams to support coordination and field-level decision-making.

EDUCATION

Bachelor of Engineering in Geospatial Engineering, 09/2016 – 12/2023 | Nairobi, Kenya

The Technical University of Kenya

Thesis: *"A Mobile Crowdsourcing GIS for Reporting Emergent Illegal Waste Disposal Sites"*

- Designed and implemented a field-based data collection and validation workflow integrating community reports with a central database.
- Emphasised data quality, participant consent, validation processes, and practical use of findings for decision-making.

SKILLS

Backend & Spatial Systems

- **Python** (FastAPI, Django, Flask)
- REST API design & integration
- **PostgreSQL / PostGIS** (spatial queries, indexing, performance tuning)
- Spatial ETL pipelines & data processing
- Schema design for geospatial applications

Web Mapping & Frontend

- **Leaflet, MapLibre, OpenLayers**
- Mapbox
- **React, SvelteKit, Vue.js**
- TypeScript / JavaScript

Geospatial & EO Tooling

- **GDAL, Rasterio, GeoPandas**
- QGIS, ArcGIS
- Satellite & Earth Observation data (e.g. Sentinel)

Web-GIS & Geospatial Platforms

- **GeoServer** (via GeoNode): WMS, WFS, WMTS, XYZ/TMS
- GeoNode (layer publishing, metadata, permissions)
- OGC standards & GIS service workflows
- Handling large raster & vector datasets
- **Titiler** (Dynamic Tile Service)

Cloud, DevOps & Infrastructure

- **Docker**, containerized deployments
- CI/CD (GitHub Actions)
- Cloud platforms: **AWS**, Microsoft Azure (primary), GCP
- Kubernetes
- Object storage & cloud-native architectures

Professional Skills

- Systems thinking & problem solving
- Translating domain requirements into technical solutions
- Performance optimization & debugging
- Clear communication with technical and non-technical stakeholders
- Working effectively in distributed, remote-first teams