Experience & practice

Umut Üçok · Spatial Analytics & GIS Platform Engineer

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PROFILE

Geospatial engineer with 10 years of experience across spatial analytics and GIS infrastructure. Builds analytics surfaces, spatial tool libraries, DAG-based execution engines and suitability-scoring systems, alongside database drivers and enterprise GIS platforms. Built a 22-tool LLM agent shipped in production at JLL and operates JLL's global ArcGIS Enterprise estate.

SELECTED WORK

Meridian — Spatial analytics platform

PERSONAL PROJECT

Container-native, OGC API-first GIS server built by composing mature open-source components. Go and TypeScript; private repository.

- **Analytics flow engine:** DAG execution, topological sorting, cycle and reference validation, append-only tool versioning, per-run ACL re-assertion and scratch-relation lifecycle management. Visual authoring constrained by the runner's validation rules.
- **Spatial tool library:** 13 tools with JSON Schema parameter sets, including hex aggregation, isochrones, overlap matrices, weighted scoring and fit_score. SQL is pushed to GEOS/PostGIS, Valhalla and GDAL as appropriate. Async PostgreSQL queue, EXPLAIN-gated reads, timeouts and caching.
- **Data engines:** Databricks SQL Warehouse driver using Arrow IPC in Go and Unity Catalog REST; Oracle Spatial, SQL Server, PostGIS, Azure Blob and HTTP API sources behind shared interfaces.
- **Serving and security:** Martin vector tiles, OGC API Features, FlatGeobuf streaming and MapLibre styles. Go gateway with huma/OpenAPI 3.1; Keycloak OIDC and PKCE; integration tests against real databases; cosign-signed images and CycloneDX SBOMs.

Atlas — LLM map agent

JLL · SOLE DEVELOPER

22 tools, 25,847 lines of TypeScript/TSX, 88% line coverage. The model selects validated tools; tools alone mutate map state.

- Analysis, layer, map and query tools covering routing, spatial joins, weighted suitability, styling, filtering, statistics and nearest features.
- Zod schemas converted to JSON Schema, multi-step plan approval, error boundaries, session-level usage and cost tracking.
- Anthropic and OpenAI SDKs behind one interface; deployed to Azure Container Apps through GitHub Actions behind SSO.

Suitability analytics — OneMapIQ and Blackbird

JLL · SOLE DEVELOPER

- Built a hex-grid site-selection engine as both a standalone application and a module in a 3D platform, with three hex resolutions, 131 attributes per cell and national coverage.
- Normalised 0–100 scoring with positive, inverse and ideal-value influence modes, configurable weights, classed hexagon symbology and percentile ranking.
- Service-area and drive-time joins, area-of-interest selection using true administrative geometry, candidate ranking and export.

EXPERIENCE

JUL 2022 — PRESENT

Senior GIS Solutions Architect / Full-Stack Developer

JLL

- Full-stack engineering across React/TypeScript, .NET API and SQL Server for Blackbird, a 3D mapping and presentation platform. Sole author of suitability, image-overlay and market-view modules.
- Built and maintained layer lifecycle, overlay systems, web-map import, feature caching, geocoding, 3D building data pipelines and property-footprint reconciliation workflows across multiple regions.
- Led the ArcGIS Maps SDK v4-to-v5 migration: partitioned approximately 600 TypeScript errors into 23 categories and authored 26 of 27 migration commits. Raised new-code coverage above the 80% quality gate.
- Retrofitted 2D map mode, modernised controllers and built an enterprise GIS consolidation toolkit in Python with a FastAPI explorer, resumable migrations, verification and rollback.
- Worked on ArcGIS Server containerisation, Databricks integration, dependency remediation, observability and quality gates across three repositories.

APR 2021 — APR 2022

Senior GIS Consultant / Architect

Freelance

Delivered Istanbul Metropolitan Municipality's route management system, including network modelling, best-facility-area routing, published geoprocessing services and enterprise environment handover.

AUG 2020 — APR 2021

GIS Technical Account Manager

MapIt

Led technical enterprise engagements across AWS and GCP; worked on forest and soil classification, stockpile volumetrics and a property management system for a large integrated steel facility.

OCT 2018 — AUG 2020

GIS Developer

Universal Software

Developed GIS/SCADA ETL for electric, water and gas networks, enterprise spatial databases, 3D mine modelling and real-time IoT geofencing.

DEC 2016 — OCT 2018

GIS Engineer

İŞLEM GIS

Worked on Turkey's national spatial address registration system (MAKS), deployed across 40+ provinces, and multidimensional meteorological datasets for the state meteorological service.

OPEN SOURCE

- **geofabrik-downloader:** Strictly typed Python client and CLI for OpenStreetMap extracts, published to PyPI under MIT with CI and strict mypy checks.
- Forks of Martin and pg_featureserv, both used by Meridian behind its gateway.

TECHNICAL SKILLS

Languages	Go, Python, TypeScript / JavaScript, SQL, C# / .NET
Spatial engines & data	PostGIS / GEOS, Oracle Spatial, SQL Server Spatial, Databricks SQL Warehouse, Unity Catalog, DuckDB, GDAL/OGR, Valhalla, osm2pgsql / osmium, MongoDB
Formats	GeoParquet, Apache Arrow IPC, FlatGeobuf, MVT, GeoPackage, GeoJSON, COG, NetCDF / HDF5 / GRIB
Standards & APIs	OGC API Features, WMS / WFS / WMTS, MVT, OpenAPI 3.1, OIDC / OAuth2 / PKCE
AI	Production LLM tool-calling, agentic patterns, Anthropic and OpenAI SDKs, Zod-to-JSON-Schema contracts, deep-learning inference on imagery
Cloud & platform	Azure, AWS, GCP, Docker / Compose, Kubernetes, GitHub Actions, Keycloak, Datadog, SonarQube, cosign / SBOM, Linux
Frontend	React 19, Redux Toolkit, TypeScript, MapLibre GL, React Flow, ArcGIS Maps SDK, OpenLayers, Leaflet, Cesium
Esri stack	ArcGIS Enterprise, Experience Builder, ArcGIS Pro, GeoEvent Server, ArcPy

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EDUCATION & LANGUAGES

BSc Geomatics Engineering — Yıldız Technical University, Istanbul (2016)

Turkish (native) · English (C1, professional working proficiency) · Spanish (beginner, improving)