

QANDEEL FATIMA

Geoinformatics Engineer | Full-Stack GIS Developer

Islamabad, Pakistan • +92 319 3638295 • gandeelf.2003@gmail.com • [GitHub](#) • [LinkedIn](#) • [Portfolio](#)

PROFILE

Geoinformatics engineer (B.E. GIE, NUST) who builds geospatial software end to end: React, Mapbox GL JS and OpenLayers front ends over Node/Express, Django and FastAPI services, backed by PostgreSQL/PostGIS and GeoServer OGC endpoints (WMS/WFS). Equally comfortable in the data layer. Python raster/vector pipelines (GeoPandas, Rasterio, rioxarray, STAC), Google Earth Engine, and containerised ML deployment with Docker. Awarded 1st Place, Best Industrial Project at NUST for an end-to-end computer-vision and IoT analytics platform.

TECHNICAL SKILLS

Languages: Python, JavaScript, C/C++, PHP, R, SQL

Frontend: React.js (Vite), Angular, HTML5, CSS3 / Tailwind, GSAP, Framer Motion, AJAX

Backend & APIs: Node.js, Express, FastAPI, Django, REST, MQTT

Geospatial Web & OGC: GeoServer (WMS/WFS), Mapbox GL JS, Leaflet, OpenLayers, PostGIS, STAC / Microsoft Planetary Computer

Databases: PostgreSQL/PostGIS, MySQL, InfluxDB, Snowflake

Geospatial Analysis: ArcGIS Pro, QGIS, ERDAS Imagine, Google Earth Engine, GeoPandas, Rasterio, rioxarray/xarray, NumPy

ML & Computer Vision: PyTorch, TensorFlow/Keras, scikit-learn, OpenCV, YOLOv11, TrackNet, CNN-LSTM, SVM

DevOps & Data Engineering: Docker, Git/GitHub, MLflow, Apache Kafka, PySpark, Hadoop, ESP32 (MQTT, BLE 5.4)

Visualization & Design: Matplotlib, Folium, Tableau, MATLAB, Adobe Photoshop/Illustrator/After Effects, Blender, AutoCAD

EXPERIENCE

NESCOM — Intern, Deep Learning & Object Detection *Islamabad, Pakistan*

- Developed convolutional neural networks for automated object detection on high-resolution satellite imagery.
- Optimized preprocessing pipelines for large-scale geospatial datasets, reducing manual data preparation effort.

Lok Virsa (National Institute of Folk & Traditional Heritage) — Fellowship *Islamabad, Pakistan*

- Selected fellow contributing digital documentation and media production for heritage preservation work.

SELECTED PROJECTS

ONYX: Spatiotemporal AI Framework for Padel Analytics | 1st Place, Best Industrial Project Award (Final Year Design Project)

React (Vite), GSAP, Framer Motion, FastAPI, PostgreSQL, InfluxDB, Docker, PyTorch, YOLOv11, TrackNet, CNN-LSTM, OpenCV, ESP32 (MQTT, BLE 5.4)

- Architected and shipped a full-stack sports analytics platform: React/Vite client, FastAPI service layer, and a dual-database backend pairing PostgreSQL for relational data with InfluxDB for high-frequency sensor time series.
- Built containerised YOLOv11 + TrackNet inference pipelines for real-time player tracking and ball trajectory prediction, orchestrated with Docker for reproducible deployment.
- Designed the low-latency IoT tier on ESP32 using MQTT and BLE 5.4, fusing wearable telemetry with the computer-vision stream into a single coaching dashboard.

Web-Based Geospatial Portal for Data Sharing & Visualisation | Django, GeoServer (WMS/WFS), OpenLayers, PostGIS

- Built a self-service geoportal where users upload spatial datasets that are automatically published as OGC WMS/WFS layers via GeoServer and rendered in an OpenLayers map client.
- Implemented a chatbot-driven spatial query interface, interactive attribute tables, and automated chart generation over uploaded layers.

Full-Stack GIS Platform for Disaster Monitoring | React, Node.js, PostgreSQL/PostGIS, Leaflet, Google Earth Engine

- Developed a real-time hazard monitoring web application integrating remote sensing feeds with a PostGIS spatial database and a Leaflet-based operational map.

- Designed the REST API and spatial schema supporting layer queries, filtering, and emergency decision-support workflows.

"Black Sky" Resilience Index & Spatial Decision Support System | React.js, Mapbox GL JS, Node.js, Python (NumPy)

- Built an interactive SDSS that ranks candidate Resilience Hubs for extended power-outage scenarios, with weighted criteria adjustable live in the Mapbox GL JS interface.
- Implemented the Analytic Hierarchy Process (AHP) multi-criteria model in Python and exposed it to the front end through a Node.js API.

Wildfire Detection & Burn Severity Mapping — NASA FIRMS + Sentinel-2 dNBR | Python, STAC, rioxtarray, GeoPandas, Folium

- Engineered a configurable, region-parameterised pipeline ingesting live NASA FIRMS hotspots from four sensors (VIIRS NOAA-20/21, VIIRS S-NPP, MODIS NRT) and querying cloud-free Sentinel-2 L2A scenes through the Microsoft Planetary Computer STAC API.
- Computed cloud- and shadow-masked dNBR and Relativized Burn Ratio, classified pixels into five USGS severity classes, and quantified ~167,600 ha of burned area for the 2021 Dixie Fire. Exported GeoTIFF rasters for QGIS/ArcGIS.
- Switchable across five global fire regions (western US, Canadian boreal, Siberia, Mediterranean, SE Australia) by bounding box, with automated cartographic severity maps and temporal fire-spread visualisation.

Automated Processing Pipeline for Urban Heat Islands | Python, GeoPandas, Rasterio, NumPy, Matplotlib

- Automated end-to-end UHI detection across South Asian cities, replacing a manual raster workflow with a scripted, repeatable analysis and visualisation pipeline.

IoT-Based Black Carbon Photometer | Arduino, Python, MySQL, custom sensor hardware

- Co-designed a low-cost air-quality sensing device and synced its readings to a spatial web dashboard for real-time pollution tracking.

Additional Geospatial Analysis Work | Google Earth Engine, ArcGIS Pro, QGIS, photogrammetry, CAD

- GIS-Based Multi-Hazard Vulnerability & Risk Analysis integrating drought, wildfire and seismic layers (GEE, ArcGIS Pro); flood-risk and LULC change prediction for the Jhelum and Chenab basins (GEE, QGIS); photogrammetric 3D reconstruction of heritage sites (Meshroom, Agisoft Metashape); 3D architectural modelling (AutoCAD, Civil 3D).

EDUCATION

B.E. Geoinformatics Engineering — NUST, IGIS/SCEE, Islamabad

Sept 2022 – Jun 2026 CGPA: 3.4

Higher Secondary School Certificate (Pre-Engineering) — Punjab Group of Colleges, Chakwal

2019 – 2021 Grade A+

CERTIFICATIONS & AWARDS

Certifications: MathWorks Computer Vision Engineer Specialization (Coursera) · ROS 2 from Scratch (Packt / Yonsei University) · Machine Learning on Google Earth Engine & QGIS (Udemy) · IoT: Wireless & Cloud Computing Emerging Technologies (Coursera)

Awards: 1st Place, Best Industrial Project Award; NUST Final Year Design Project · University Ambassador, GIKI ISYS'11 (2023) · Lapel Pin, NUST Student Affairs

Languages: English (Fluent) · Urdu (Native) · German (A2)

LEADERSHIP & VOLUNTEERING

Leadership: Vice President of Media, EFX NUST / ASME International (2025) · Director Graphics, NUST Orientation (2024–25) · Executive Admin Coordination, NUST Olympiad (2024, 2026) · Director Media, ASHRAE NUST (2023) · Organizing Committee, NIMUN '26 and TEDxNUST '25

Volunteering: Directed a PCRWR documentary linking water resource mismanagement, climate change and Pakistan's 2022 floods · Fundraising volunteer, Diamer-Bhasha Dam national initiative · Fundraiser, Al-Khidmat Foundation Pakistan (2022–23)