Muhammad Safdar

GIS Specialist and GeoAI Practitioner

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GitHub: github.com/safdar404 | Portfolio: safdar404.github.io/

Professional Profile

GIS professional with more than 12 years of experience across government, consulting, housing, land administration, disaster management, agriculture and infrastructure assignments. Holds an MSc in Geographic Information Systems from the University of the Punjab. Experience includes enterprise geodatabases, cadastral and utility mapping, spatial analysis, remote sensing, geographic data validation, cartography and engineering decision support. Has worked with ArcGIS and QGIS and developed Python-assisted processing and application workflows. Brings additional exposure to Gulf-region projects, research-oriented image analysis and emerging GeoAI tools.

Seeking GIS Specialist, GIS Analyst, GIS Manager, Geospatial Analyst, Remote Sensing Analyst or related positions in Pakistan requiring reliable spatial datasets, practical analysis and clear technical deliverables.

Core Competencies

- GIS database development, maintenance, spatial-data integration and repository management.
- Cadastral and parcel mapping, housing-sector GIS, land-use mapping and CAD-to-GIS conversion.
- Spatial analysis, site suitability, terrain analysis, cartographic production and stakeholder reporting.
- Geospatial QA/QC, coordinate-system checks, georeferencing, geometry validation and attribute consistency.
- Satellite imagery analysis, crop monitoring, environmental mapping and disaster-risk support.
- GPS survey data integration, UAV-derived terrain products and engineering GIS support.
- Python-assisted automation, web mapping, dashboards and AI-enabled application prototypes.
- Technical documentation, GIS user support, staff training and multidisciplinary coordination.

Selected Professional Contributions

- Supported GIS delivery for Saudi infrastructure, wastewater utilities, urban development, mining ecology and terrain assignments.
- Prepared standardized spatial datasets from CAD drawings, cadastral records, imagery and field-survey observations.
- Managed agricultural GIS repositories and integrated imagery and field information for crop and land assessment.
- Contributed flood, hazard, vulnerability and evacuation mapping for disaster-management decision support.
- Supported GIS workflow adoption and staff training in housing-sector mapping and data quality.

Professional Experience

GIS Specialist

Professional Geo Tech Services FZC LLC | 5 February 2025 to 30 June 2026

- Developed, maintained and updated GIS databases and geospatial datasets for engineering, planning and operational teams.
- Collected, validated and integrated geographic information from multiple sources using ArcGIS, QGIS and related applications.
- Conducted spatial analysis and prepared maps, visualizations, technical reports and project presentations.

- Supported infrastructure, wastewater utilities, urban development, mining ecology and terrain projects serving Saudi Arabia and the UAE remotely.
- Used Python-assisted spatial processing, validation and reporting workflows and explored AI-assisted classification and quality-review methods.
- Prepared orthomosaic, elevation, contour and terrain outputs using UAV, survey, LiDAR and satellite inputs within project requirements.
- Applied data accuracy checks and organizational quality standards and completed GIS deliverables in coordination with project teams.

GIS Expert

TerraSense Consulting Pvt Ltd | Lahore | 20 December 2023 to 6 January 2025

- Managed and implemented GIS assignments involving spatial analysis, mapping and geographic data processing.
- Used Python, ArcGIS ModelBuilder and Spatial Analyst to support repeatable processing and reporting workflows.
- Applied Google Earth Engine and geospatial analysis methods to land-use and land-cover, terrain, infrastructure and environmental studies.
- Explored Azure AI and prompt-assisted querying and reporting while maintaining geographic data quality controls.
- Prepared analytical outputs and supported project teams in interpreting spatial information.

GIS Specialist

Federal Government Employees Housing Authority | Islamabad | 1 March 2021 to 18 September 2023

- Managed parcel, cadastral and infrastructure GIS information for housing-sector planning and land administration.
- Supported mapping for G-14, F-14, F-15, G-15/3, Bara Kaho and Kuri Road assignments.
- Converted and reconciled CAD drawings and survey information into standardized GIS layers and geodatabases.
- Prepared maps and spatial reports for planning, land-management and technical stakeholders.
- Supported staff training in GIS workflows, spatial-data management and quality practices.

Further Professional Experience

GIS Manager

Kernel Seed Corporation | Pakistan | 5 May 2019 to 10 March 2021

- Managed GIS activities and organized geospatial repositories for agriculture-related analysis and decision support.
- Designed and maintained geodatabases, verified dataset accuracy and improved the organization and accessibility of spatial information.
- Performed georeferencing, crop analysis and real-time mapping tasks.
- Integrated satellite imagery, field data and enterprise information for land assessment, crop monitoring and site-suitability work.
- Prepared management reports and provided GIS system support, troubleshooting and quality control.

GIS Manager

Project Implementation Unit Punjab Disaster Management Authority | Multan | 8 November 2017 to 30 April 2019

- Worked under the Asian Development Bank-funded Flood Emergency Reconstruction and Resilience Project.

- Supported flood early-warning and disaster-risk decision workflows with geospatial information.
- Prepared DEM-based hazard, flood, vulnerability and evacuation-route maps for emergency planning and response.
- Coordinated cadastral and field-survey mapping, geodatabase development and spatial-data quality checks.
- Supported processing and QA/QC of Multi-Hazard Vulnerability and Risk Assessment datasets.

Junior GIS Professional

The Urban Unit | Spatial Data Infrastructure Management System FGEHF Islamabad | 1 April 2015 to 31 July 2017

- Supported spatial data infrastructure development and GIS data management for the FGEHF Islamabad project.
- Performed digitization, cadastral mapping, spatial analysis and satellite-image processing.
- Maintained Esri geodatabases, validated spatial information and prepared technical mapping outputs.
- Produced cartographic and analytical reports for project and management review.

GIS Associate

Loyal Consultants | Pakistan | 25 June 2012 to 30 March 2015

- Prepared digitized base maps and parcel-based GIS datasets for housing-development projects.
- Conducted GPS surveys and collected spatial information for land-use and cadastral mapping.
- Created shapefiles, maintained geodatabases and prepared GIS maps.
- Analyzed satellite imagery, supported image rectification and converted AutoCAD drawings into GIS formats.

Research and Earlier Experience

Research Assistant

Institute of Space Technology | Department of Space Science Islamabad | June 2013 to June 2014

- Contributed to projects mapping snow-cover variations over the Gilgit-Hunza basin.
- Supported development of glacier and glacier-lake inventories using geospatial techniques.
- Performed image-processing and GIS-analysis work to support research mapping and inventory preparation.

GIS Assistant

The Urban Unit | Urban Sector Planning and Management Services Unit | 21 February 2012 to 20 June 2012

- Worked in Bahawalpur district on GPS and real-time GIS surveys.
- Performed spatial data entry, data management and generation of shapefiles.
- Created KML and KMZ files in Google Earth and integrated survey observations into mapping workflows.
- Supported parcel, land-use, encroachment and Katchi Abadi mapping for urban planning.

Planning Officer

Service Masters Pvt Ltd | Lahore | January 2011 to February 2012

- Prepared maps and plans under a contract-based planning appointment.
- Supported planning deliverables through organized map preparation and documentation.

Education

MSc Geographic Information Systems

University of the Punjab, Lahore | Session 2009 to 2011

Relevant study: GIS programming, geostatistics, spatial analysis, spatial data infrastructure, transportation GIS and spatial decision support. Final project: Online Real Estate Management System, six credits; 81 marks, grade A-.

BSc Computer Science Statistics and Economics

The Islamia University of Bahawalpur | 2008 | First Division

Academic background in computing, statistics and economics; marksheet result 514 out of 800.

Executive MBA Marketing

The York International College, UAE | In progress

Selected Project Areas

- Infrastructure and utilities GIS: spatial datasets, engineering maps and reporting for NWC Riyadh and associated Saudi infrastructure assignments.
- Mining ecology and terrain: GIS and terrain-related outputs for Almandra Mining, Taif.
- Housing and land administration: parcel and infrastructure mapping for FGEHA and spatial data infrastructure work for FGEHF.
- Disaster management: flood-risk, vulnerability and evacuation mapping under PIU-PDMA.
- Agriculture: georeferencing, crop analysis and agricultural geodatabase management at Kernel.

Technical Skills

GIS software and enterprise platforms

ArcGIS Pro, ArcGIS Desktop, ArcGIS Enterprise, ArcGIS Online, ArcSDE and QGIS; geodatabase management, editing, spatial analysis and map production.

Spatial databases and SQL

Oracle Database and PL/SQL, PostgreSQL and PostGIS, SQL Server and SQLite; spatial-data organization, queries, data integration and validation.

Python and automation

Python, ArcPy, pandas, NumPy, ArcGIS ModelBuilder and processing scripts. Application work with Streamlit, FastAPI, Pydantic and pytest; continued development in scikit-learn and model evaluation.

Web GIS and data integration

FME workflows, GeoServer, Leaflet, OpenLayers, Mapbox, ArcGIS JavaScript API, HTML, CSS and JavaScript; REST API integration and interactive map development.

Remote sensing

Google Earth Engine, ERDAS Imagine and ENVI; Sentinel and Landsat imagery, image classification, georeferencing, land-use and land-cover analysis, SAR and environmental mapping.

Survey and terrain

GPS and GNSS data, RTK and PPK workflows, ground control points, UAV photogrammetry, LiDAR and DEM, DSM and DTM products; contours and terrain visualization.

CAD BIM and reporting

AutoCAD, Civil 3D, CAD-to-GIS conversion, exposure to BIM and IFC-to-GIS workflows, Power BI, dashboards, cartography and KPI reporting.

AI and development platforms

LangChain, retrieval-augmented generation, OpenAI API integration and AI-assisted reporting; exposure to OCR, Flask, n8n and Make.com workflows. Azure AI, AWS and Google Cloud learning; Git, GitHub and Docker fundamentals.

Python and GeoAI Portfolio

Document Retrieval and Chat Application

Repository: github.com/safdar404/LangChain-RAG-Application

- Python application integrating PDF and text loading, document chunking, OpenAI embeddings and SingleStore vector retrieval.
- Streamlit interface for document upload, retrieval settings, streamed answers and display of retrieved source snippets.
- Modular source files separating document ingestion, retrieval configuration and the chat interface.

Geospatial Risk Screening Demonstrations

Repository: github.com/safdar404/geoai-resilience-research-lab

- Python reference functions for flood prioritization, utility risk, urban suitability, runoff and spectral-change examples.
- FastAPI endpoints with validated inputs and selected pytest checks for calculation properties and invalid inputs.
- Transparent screening formulas and rule-based recommendation examples for research and application development.

GeoSentinel and Flood Intelligence Applications

Portfolio concepts include infrastructure evidence review, flood and drainage mapping, incident monitoring, work-order verification and decision-support dashboards. These projects extend practical GIS experience into web applications and AI-assisted workflows.

Professional Training and Credentials

GIS Remote Sensing and Spatial Data

- Spatial Data Science The New Frontier in Analytics | Esri MOOC | 23 October 2025 | Six weeks.
- The ArcGIS Imagery MOOC Foundations and Frontiers | Esri | 28 November 2025 | Six weeks.
- Cartography | Esri MOOC | 3 October 2025 | Six weeks.
- GIS for Climate Action | Esri MOOC | 5 June 2024 | Six weeks.
- Make an Impact with Modern Geo Apps | Esri MOOC | 1 May 2025 | Four weeks.
- ArcGIS Pro Basics | Esri web course | 1 July 2024.
- Working with the ArcGIS Solution for 3D Buildings | Esri ArcGIS Lab | 4 July 2024.
- Downscaling a Prediction Model Using ArcGIS Notebooks and ArcGIS Pro | Esri ArcGIS Lab | 25 February 2025.
- Integrate Spatial Data | FME training | 5 March 2025.
- Geo Web App Building with OS Tools | ITC and Geoversity | 16 April 2025 | 40-hour non-credit attendance course.
- UAVs in Precision Agriculture | ITC and Geoversity | 25 March 2025 | 40-hour non-credit attendance course.
- Active and Passive Satellite Data Analysis Using Cloud Computing for Surface Water and Flood Mapping | UNU-INWEH Water Learning Centre.
- Introduction to Geospatial Data Analysis | UNU-INWEH and UNESCAP Water Learning Centre.

Programming Data Analytics and AI

- Python Essentials 1 | Cisco Networking Academy and OpenEDG Python Institute | 16 January 2026 | Course completion.
- The Complete PL SQL Bootcamp Beginner to Advanced PL SQL | Udemy | 6 July 2026 | 26 hours.
- Data Analytics and Business Intelligence | DigiSkills | 14 March 2026.
- AutoCAD | DigiSkills | 14 March 2026.
- AI Fundamentals with IBM SkillsBuild | Cisco Networking Academy | 18 January 2026.
- AWS Cloud Practitioner Essentials | AWS Training | 7 January 2026 | Course completion.
- Generative AI with Diffusion Models | AWS Training | 13 January 2026.
- AWS AI Practitioner Challenge | Udacity | 1 May 2026 | Course completion.
- Azure OpenAI Generative AI Models and How to Use Them | LinkedIn Learning | 2 July 2024.
- Learning Cloud Computing Core Concepts | LinkedIn Learning | 3 July 2024.
- Introduction to Artificial Intelligence | 28 June 2025.

Remote Pilot Credential

Remote Pilot Certificate for the Open Category | General Authority of Civil Aviation, Saudi Arabia | Issued 18 December 2025 | Valid until 18 December 2026.

Management Environment and Professional Development

- Project Management Foundations | LinkedIn Learning | 2025.
- Agile Scrum Foundation | 9 June 2025; Agile Scrum Master | 12 June 2025.
- UNDRR UNOSSC PAHO Joint Online Training on Urban Health and Disaster Risk Reduction | March 2025.
- Strategic Planning for Renewable Energy and Energy Efficiency Projects | ICLEI | 19 June 2025.
- Diploma in Environmental Science | Alison course | 28 June 2016.
- Exploring Planet Earth Its Systems and Resources | Alison | 2 June 2016.
- International Mountain Day campaign participation | 2014.
- Additional Coursera guided projects in WordPress, SEO and interview preparation | June 2026.

Professional Strengths

Analytical problem solving; attention to spatial-data accuracy; independent delivery and teamwork; technical reporting; coordination with engineering and planning teams; willingness to learn new tools; and practical understanding of public-sector and consulting GIS workflows.

References

Academic and professional references are available on request.