

# Sirak Tesfamariam Asfaha

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## SUMMARY

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Experienced Geospatial Data Scientist and Web GIS Developer with a Master's degree in Geospatial Technologies and a background in geology. Skilled in remote sensing, GIS, and machine learning, with expertise in processing and analyzing satellite data, environmental monitoring, and spatial decision-making. Proficient in managing complex geospatial datasets and developing interactive web-based GIS platforms. Strong technical skills in Python, SQL, QGIS, ArcGIS Pro, FME Form, and GeoServer. Always eager to take on new challenges and further expand my skills in geospatial technology.

## EXPERIENCE

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### Exploration Geologist — GIS Analyst

Dec 2021 – May 2023

*Zara Mining Sh. Co.*

*Anseba, Eritrea*

- Manage the geological, geophysical, geochemical exploration data
- Mapping regional alterations and structure features (e.g Faults) using Satellite imagery
- Create and update all the spatial layers and information
- Manage all RC and Diamond drill data, create profiles, sections and advanced maps
- Creating 3D Geological Modeling

### GIS Analyst

Jul 2019 – Nov 2021

*Ministry of Energy and Mines*

*Asmara, Eritrea*

- Database creation, maintenance and updating
- Conducted remote sensing activities, including processing satellite imagery for analysis and interpretation
- Spatial and hydrometeorological data creation, editing and updating using GPS, digitizing using satellite image maps as a background
- Georeferenced historical geological maps with modern geospatial data, improving analysis and visualization

## EDUCATION

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### Master of Science in Geospatial Technologies

Apr. 2024 – Mar 2025

*University of Münster, Germany - Universidade Nova de Lisboa, Portugal*

### Bachelor of Science in Geology

Sep. 2014 – Jul 2019

*Eritrean Institute Technology, EIT, Mai-Nefhi, Eritrea*

## TECHNICAL SKILLS

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**Languages:** Python, Javascript/Typescript, PostgreSQL, HTML, CSS

**Frameworks:** Django, Flask, Next.js, Leaflet, Three.js

**Developer Tools:** Git, Postman, Docker, Linux

**GIS Software:** QGIS, ArcGIS Pro, FME Form, Geoserver

**Libraries:** Numpy, Pandas, Geopandas, Xarray/Rioxarray, TensorFlow, Google Earth Engine

**Design Tools:** Adobe Illustrator, Figma

## PROJECTS

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### Predicting Mineral Anomalies using ASTER and Sentinel-2 data in Eritrea (Thesis) | Sep 2024 – Feb 2025

*QGIS, ArcGIS Pro, TensorFlow, Google Earth Engine*

- Enhanced alteration minerals detection through band rationing and Principal Component Analysis (PCA)
- Visualized mineral distributions using RGB band composition for spatial analysis
- Applied oversampling (SMOTE) and under sampling resampling techniques
- Developed and trained machine learning models, Random Forest and Support Vector Machines (SVM), to predict mineral occurrences

## Land Cover Classification from Aerial Image Using U-net in Poland | *QGIS, TensorFlow, Git* Apr 2024 – Jul 2024

- Developed a U-Net (ResNet32) deep learning model with the Segmentation Models library in Python for land cover classification
- Applied data augmentation techniques to improve classification accuracy
- Evaluated model performance using Intersection over Union (IoU) metrics, demonstrating improved results with augmented data

## Aa River - Web Portal | *Django, Geoserver, PostgreSQL, leaflet, Three.js, Git* Apr 2024 – Jul 2024

- Implemented a fully interactive dashboard for Aa river data overview
- Developed 2D and 3D visualization and comparability, including LiDAR point clouds and Multispectral images
- Deployed on virtual machine running Windows Server

## Restaurant Finder | *ETL, Bootstrap 5, Django, PostgreSQL, leaflet, Git, Docker* Jan 2024 – Feb 2024

- Developed a full-stack web application using Django serving a REST API with Bootstrap 5 as the front end
- Extract, transform and load restaurant data from Google API, stored in PostgreSQL
- Create, Read, Update, Delete (CRUD) operations for user reviews
- Integrate interactive maps for navigation and route guidance
- Used Docker for containerization and deployment

## Eritrean Geological Survey Webdatabase | *Django, Geoserver, PostgreSQL, GDAL* Oct 2018 – Mar 2021

- Developed a centralized web platform for storing and managing geochemistry, geophysics and map data
- Implemented a security system and user account verification
- Enabled integration with GIS tools for visualization, editing and exporting data
- Facilitated optimized search queries and provided a summary view of geospatial data

## RELEVANT COURSES

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<b>FME Form Basic</b>   <i>Safe Software</i>  (Certificate Link)	Sep 2024
<b>GIS for Climate Action</b>   <i>ESRI MOOC</i>  (Certificate Link)	Nov 2024
<b>Semi-supervised Learning for Aerial Science Classifications with Deep Learning</b>   <i>Geomundus</i> • (Certificate Link)	Oct 2023
<b>Complete Remote Sensing Image Analysis with ENVI Software</b>   <i>Udemy</i>  (Certificate Link)	Feb 2023
<b>Machine Learning</b>   <i>Coursera—Stanford</i>  (Certificate Link)	Oct 2021
<b>Remote Sensing Image Acquisition, Analysis and Applications</b>   <i>Coursera—UNSW-IEEE GRSS</i> • (Certificate Link)	Oct 2021
<b>Neural Networks and Deep Learning</b>   <i>Coursera—DeepLearning.ai</i>  (Certificate Link)	Sep 2021
<b>Spatial Data Science and Applications</b>   <i>Coursera—YONSEI UNIVERSITY</i>  (Certificate Link)	Mar 2020