Leila Maritim

ML Geospatial Data Scientist

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Experience

GIS Analsyt (Intern)   July 2023 – August 2023

Deutsches Zentrum für Luft- und Raumfahrt   *Munich, Germany*

- Deployed modular Python pipelines using pandas, geopandas, rasterio, NumPy to automate end-to-end spatial data extraction, cleaning, and descriptor computation across municipal and 1 km² grid scales, reducing manual preprocessing time and ensuring consistent, reproducible analyses.
- Implemented vectorized data-validation and error-handling routines to detect and correct geospatial inconsistencies—leveraging batch operations for rapid fault isolation—boosting data quality and eliminating common processing errors.
- Integrated NetworkX for spatial network analysis, constructing and analyzing graph models of transportation and infrastructure networks (e.g., routing, centrality, service-area calculations), thereby enriching descriptor sets with connectivity metrics.

Spatial Data Analyst (Consultant)   July 2022 – Sep 2022

UN Habitat   *Nairobi, Kenya*

- Extracted, standardized, and integrated multi-source vector datasets—including satellite imagery, OpenStreetMap, and government GIS repositories—using Python (GeoPandas, Fiona, Shapely) and QGIS, ensuring consistent schemas for urban features (bus stops, green spaces, roads) for various cities across the globe.
- Conducted advanced spatial analyses including service-area and network modeling with NetworkX, zonal statistics via rasterio and GDAL, and accessibility assessments to calculate key urban indicators (public open space, green area per capita, transport access) and automatically feed these disaggregated metrics (by sex, age, and disability status) into the Urban Indicators Database for global city updates.

GIS Analyst   Oct 2019 – Dec 2021

Joint National Aerial Mapping Project   *Nairobi, Kenya*

- Led and supervised a multidisciplinary team of over 100 data clerks and land officers in the comprehensive digitization of Kenya's paper-based land transaction and ownership records, ensuring accurate and timely migration into the National Land Information Management System.
- Designed and implemented data-capture and validation protocols, defining standardized schemas and automated quality checks so that fully digitized, error-free records could be seamlessly extracted and ingested into the LIMS.
- Delivered targeted training programs and hands-on workshops on GIS-based data entry, OCR-assisted record scanning, and validation best practices, boosting team proficiency and reducing data-entry errors by over 90%.
- Coordinated cross-functional collaboration with IT, legal, and registry stakeholders to align digitalization workflows with regulatory requirements, ensuring the new system supported transparent, secure land transactions and ownership tracking.

Assistant Data Analyst   Jan 2019 – Sep 2019

West kenya Sugar Company   *Kakamega, Kenya*

- Trained and supported field officers in using handheld GPS units for high-precision sugarcane farm data collection, developing easy-to-follow guides and troubleshooting protocols that improved data capture consistency by over %80.
- Provided ongoing technical assistance both in the field and remotely, diagnosing GPS hardware issues, calibrating devices, and ensuring seamless integration with GIS software for real-time mapping.
- Developed and automated comprehensive management reports by aggregating and normalizing data from workshop maintenance logs, transport GPS feeds, factory production systems, and agricultural field-survey applications—leveraging Python (pandas, SQLAlchemy) for ETL and Jupyter notebooks for exploratory analysis.
- Built an interactive dashboard in Tableau driven by a centralized data warehouse, enabling real-time visualization of key performance indicators (KPIs) across workshop uptime, fleet utilization, mill throughput, and crop yields.

Core Skills

GIS, Remote Sensing, and Cloud Computing: ArcGIS (Pro, Online, ModelBuilder, Data Interoperability), QGIS, Google Earth Engine, Mapbox, Web GIS Tools, Satellite Data Analysis (Sentinel, Landsat, Hyperspectral, SAR), Raster and Vector Analysis, Geospatial Data Management, PostgreSQL/PostGIS, EO Data Cubes, OpenEO, AWS (S3, Open Data Registry), Google Cloud, Data Quality Assurance.

Programming and Data Analysis: Python , R ,Java, SQL, Tableau, JavaScript, Statistical Modeling, Data Warehousing, Data Integration, Automation for GIS.

Machine Learning for Geospatial Applications: PyTorch, TensorFlow, Scikit-learn, Time Series Analysis, Deep Learning for Remote Sensing, AI Model Development for EO Data.

Soft Skills: Project Management, Data Documentation & Reporting, Analytical Thinking, Research Design, Effective Communication, Scientific Presentation, Teamwork, Resourcefulness, Interdisciplinary Collaboration, Mentorship and Training, Adaptability in Multicultural Teams.

Education

Université Bretagne Sud & University of Salzburg   Sep 2022 – July 2024
Dual Masters of Science in GeoData Sciences & Geoinformatics   *Vannes, France & Salzburg, Austria*
  * **Honors:** Awarded ERASMUS Mundus Scholarship for COPERNICUS MASTER IN DIGITAL EARTH
  * **Thesis:** Feature Extraction In An Object-based Image Analysis Context
  * **Key courses:** Artificial Intelligence, Computer Vision, Spatial Databases, Advanced RS (SAR, LiDAR, Hyperspectral)

Jomo Kenyatta University o Agriculture and Technology   Sep 2013 – Nov 2018
Bachelor of Science in Geomatics Engineering and Geospatial Information Systems   *Nairobi, Kenya*
  * **Thesis:** Spatio-temporal Evaluation of Water Level Fluctuation in Lake Baringo, Kenya
  * **Key courses:** Web GIS, Land & Engineering Surveying, Remote Sensing & GIS, Hydrology, Geomorphology

Projects

Master Thesis Project | *Deep Learning, Remote Sensing, PyTorch, Geoopt, Pyreimannian, SPDNet, Sci-Kit Learn, TimeSeries*
  * Developed an end-to-end feature extraction approach to automatically extract spectral, textural, and geometric features from arbitrarily shaped objects using graph neural networks for an improved downstream semantic segmentation application.

Kelp Forest Segmentation | *SegNet, UNet, Multispectral Imagery, PyTorch, Pandas, Numpy, Xarray, Rasterio, GPU Clusters*
  * Utilized SegNet, UNet, UNet++ architecture for kelp detection and mapping from optical satellite imagery, outperforming SegNet baseline performance.
  * Incorporated distance transforms and additional indices as features and experimented with various loss functions to reach 0.7 dice score, as part of the "Kelp Wanted Driven Data" competition 2024.

Time-Series Crop Classification | *LSTM, 1D-CNN, PyTorch, Rasterio, Numpy, Pandas, Multispectral Imagery, GPU Acceleration*
  * Developed deep learning models, including MLP, CNN & LSTM architectures, to identify crop types using multi-spectral temporal profiles from the MiniTimeMatch dataset, a subset of the TimeMatch dataset focusing on Austria.

Extra-Curricular Activities

Languages

Fluent	**Intermediate**	**Novice**	**Native**
English	French	German	Swahili

Hobbies & Interests

Humanitarianism, Mapping & GIS Visualization, Event planning, Outdoors, Arts and Crafts.