Shimon Francis

Spatial Intelligence Engineer

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Profile

GeoAI professional focused on **spatial intelligence, remote sensing, and AI-driven geospatial analytics**. Experienced in building **deep learning–powered spatial workflows**, intelligent geoprocessing pipelines, and decision-support systems using modern geospatial and AI frameworks. Passionate about applying **GeoAI to solve real-world challenges**.

Professional Experience

08/2025 – Present
Bengaluru

Ubique Systems
GIS Developer
Client: Brillio | End Client: Verizon

- Processed and analyzed **high-resolution satellite imagery** for **building-level roof classification (flat vs. pitched)** using **deep learning pretrained models**, supporting telecom infrastructure planning.
- Developed **AI-driven geospatial pipelines** integrating **optical (Sentinel-2) and SAR (Sentinel-1) data** for **urban change detection** and land-use analysis.
- Resolved complex **GDAL and raster processing issues** to enable accurate **viewshed and line-of-sight analysis** for telecom network design and coverage planning.
- Designed and built a **stateful LangGraph agent** to automate **broadband qualification**, combining geospatial data, AI reasoning, and decision logic. Also Implemented a **RAG** tool for rules and user question in the agent.
- Performed **multi-temporal satellite image analysis** to detect urban growth, infrastructure changes, and environmental patterns using deep learning pretrained models.

05/2023 – 08/2025
Glasgow, United
Kingdom (Remote)

Hypervine
Senior Data Analyst
Responsibilities:

- Developed an **object detection** model to identify various types of vehicles within mining sites, including Haul Trucks, Water Trucks etc.
- Utilized vehicle detection outputs to estimate emissions, contributing to Climate TRACE's efforts in monitoring and mitigating environmental impacts.
- Implemented pyroSAR workflow for **SNAP automation**. such that human effort for finding coherence estimations using SNAP has been reduced to an extent such that large quantity of SAR data can be processed automatically with a limited time.
- Developed workflows to compute coherence from Sentinel-1 SAR data for monitoring mining activities.Utilized coherence analysis to assess mining activity patterns and contributed to emissions estimation for the Climate TRACE initiative.
- Automated large-scale geospatial data processing pipelines for accuracy and efficiency in emissions tracking.Collaborated with cross-functional teams to translate remote sensing outputs into actionable climate insights.

- Designed and developed a Power BI dashboard to visualize the results of coherence estimation for mining sites.Integrated Sentinel-1 SAR data outputs into interactive visuals, enabling stakeholders to easily interpret activity patterns and emissions estimates.Provided actionable insights by combining spatial analysis with dynamic data visualizations, contributing to the Climate TRACE initiative.
- Enhanced decision-making with intuitive charts, graphs, and geospatial overlays, ensuring accessibility for both technical and non-technical audiences.

Acomplishments:

- Successfully developed an object detection model using Raster Vision to identify and return **vector bounding boxes for construction sites from oblique imagery.** This project merges cutting-edge deep learning techniques with geospatial data analysis, automating detection processes in complex visual environments. Key Highlights:
- Utilized Raster Vision for efficient model training and inference.
- Worked with GeoJSON vector-based training labels derived from oblique imagery, where Raster Vision converts these into bounding boxes for object detection and back to vector bounding boxes after prediction.
- Delivered accurate vector-based bounding boxes, seamlessly integrating into geospatial workflows.
- This was an incredible experience at the intersection of computer vision and geospatial technology, pushing the boundaries of object detection in real-world applications.

- Developed a Python script to download high-resolution GeoTIFF images from a Tile Map Server (TMS) using the powerful tms2geotiff library. This script integrates KMT. files, allowing for seamless and precise downloading of satellite imagery tailored to specific areas of interest. Key Features:
  - Utilizes KML files for defining regions of interest, ensuring efficient and targeted downloads.
  - Leverages the Ims2geotiff library to produce high resolution GeoTIFF images, suitable for geospatial analysis and remote sensing applications.
  - The downloaded GeoTIFF images can be used for training machine learning models, enabling advanced applications in fields like land use classification, object detection, and environmental monitoring.
- Developed a Python-based workflow for coherence estimation in time-series InSAR data using pyroSAR, a large- scale ESA SNAP API. Previously, the workflow relied on manually operating SNAP software, which was time- intensive. The new approach fully automates the process through code, significantly reducing processing time and effort. This automation integrates key steps such as data. ingestion, pre-processing, and coherence computation, leveraging SNAP's Graph Processing Tool (GPT) alongside the scalability and efficiency of the pyroSAR framework. The solution is tailored for large Sentinel-1 datasets, streamlining analysis and enhancing productivity.

10/2021 – 08/2022 Hyderabad, India	**Cognizant Technology Solutions** Senior Process Executive-Data Responsibilities:

- Utilize data analytics to extract insights from imagery data and provide high-quality maps.
- Mentor and guide new team members, and prepare report on work progress and asset status in weekly team meetings.
- Manage end-to-end process of accepting assets through satellite pipeline and publishing up-to-date data to the live database.
- Ensure data privacy and security by scrutinizing assets after each processing stage and conducting a keyhole assessment before final publication and ensure that image quality and censorship issues are addressed before pushing Synthetic Oblique and Synthetic Nadir Imagery (High-resolution imagery).
- Use Python and R programming to perform corrections
- Use SQL for querying data, customer reviews etc

| 02/2020 – 09/2021 | **Cognizant Technology Solutions** |
| Hyderabad, India | Process Executive-Data |

Responsibilities:
- Quality control operations of satellite imagery including validation of assets, assessment of masking efficiency, Review of customer feedback on the functioning and operation of Google Maps desktop and mobile application.
- Identify areas for improvement by analyzing trends and patterns, and provide valuable insights for stakeholders in the imagery analysis process for each epoch.
- Implementation of 2-D Imagery operation tool for updating and modifying Google Maps and Google Earth imagery.

Education

| 06/2017 – 05/2019 | **MSc Computer Science with specialization in Geospatial Analytics, Indian** |
| Trivandrum, India | **Institute of Information Technology and Management-Kerala (IIITM-K)** |

| 06/2014 – 04/2017 | **Bsc Physics, W.M.O Arts and Science College** |
| Wayanad, India | |

Skills

GeoAI & Deep Learning
- TorchGeo
- Raster Vision
- Pytorch
- Tensorflow
- CNNs
- Computer Vision

SAR Engineering
- pyroSAR
- InSAR Coherence Estimation
- Sentinel-1.

Agentic Workflows
- Langchain
- LangGraph
- DeepAgent
- State Machines
- Decision Logic

Softwares
- QGIS
- SNAP

Geospatial Automation
- GDAL
- Rasterio
- Shapely
- Geopandas
- Fiona
- ETL Pipelines
- Pandas

Certificates

Complete Generative AI Course With Langchain and Huggingface
- Langchain
- Agents
- LangGraph

Feature Engineering 2
- Scikit-Learn
- TensorFlow
- Python

Intermediate Machine Learning
- Scikit-Learn
- TensorFlow

LangChain- Develop AI Agents with LangChain & LangGraph
- Langchain
- LangGraph
- Deep Agents
- RAG
- Multi Agents

Intro to Deep Learning
- TensorFlow
- Deep Learning
- Python
- Computer Vision

Intro to Machine Learning
- Scikit-Learn
- TensorFlow
- Python

AI/ML for Geodata Analysis
Issued By: Indian Institute of Remote Sensing (IIRS), Indian Space Research Organization (ISRO) Skills Gained:
- Artificial Intelligence
- Machine Learning
- Deep Learning
- Convolutional Neural Networks
- Geospatial Data

Geospatial Analysis
- Geospatial Data
- Geographic Information Systems (GIS)
- Rasterio
- Geopandas