

# Shimon Francis

## Senior Data Analyst

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## Profile

I am a skilled Data Analyst with expertise in Geospatial Intelligence, Remote sensing, and Data Visualization. I specialize in processing and analyzing complex geospatial data to deliver actionable insights that support decision making. Proficient in tools such as Python, TorchGeo, Raster Vision and Power BI, I bring a detail-oriented approach to solving problems and optimizing workflows. With a strong focus on precision and innovation, I excel in combining technical expertise with a commitment to impactful and efficient data solutions.

## Education

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

## Professional Experience

### Senior Data Analyst, Hypervine

06/2024 – present | Glasgow, United Kingdom

#### Responsibilities:

- Developed an **AI-based 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.

#### Accomplishments:

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.

### Data Analyst, Hypervine

05/2023 – 05/2024 | Glasgow, United Kingdom

#### Responsibilities:

- 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.

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

## Certificates

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### 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

### Feature Engineering

- Scikit-Learn
- TensorFlow
- Python

### Intro to Deep Learning

- TensorFlow
- Deep Learning
- Python
- Computer Vision

### Data Visualization

- Pandas

### Geospatial Analysis

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

### Intermediate Machine

#### Learning

- Scikit-Learn
- TensorFlow

### Intro to Machine Learning

- Scikit-Learn
- TensorFlow
- Python

- 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.

### Accomplishments:

1. Developed a Python script to download high-resolution GeoTIFF images from a Tile Map Server (TMS) using the powerful tms2geotiff library. This script integrates KML 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 tms2geotiff 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.

2. 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.

### Senior Process Executive-Data,

*Cognizant Technology Solutions* 

10/2021 – 08/2022 | Hyderabad, India

### 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.

## Skills

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### TorchGeo

TorchGeo is a PyTorch library that simplifies geospatial machine learning by providing datasets, samplers, transforms, and pre-trained models, bridging the gap between ML and remote sensing experts.

### Raster Vision

Raster Vision provides a full suite of utilities for dealing with all aspects of a geospatial deep learning workflow: reading geo-referenced data, training models, making predictions, and writing out predictions in geo-referenced formats.

### pyroSAR

pyroSAR enables scalable SAR data processing by reading data from various missions, handling metadata, and providing access to SNAP and GAMMA utilities. It streamlines preprocessing, formats data for analysis, and supports export to Data Cube solutions.

### Convolutional Neural Networks

### Deep Learning

### Geospatial Data Analytics

### Remote Sensing

### Geospatial Intelligence

### QGIS

### SNAP

### Power BI

### Computer Vision

### Python

### R

### SQL

- 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

### Process Executive-Data, Cognizant Technology Solutions [🔗](#)

02/2020 – 09/2021 | Hyderabad, India

#### 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.

### Project Intern,

National Centre for Earth Science Studies(NCESS) [🔗](#)

12/2018 – 05/2019 | Trivandrum, India

Thesis on 'Finding Directional wave spectrum and height of ocean waves using Video Remote Sensing'