

# Sukanto Das

Geospatial Data Engineer | Remote Sensing & Analytics Specialist

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## Profile

Geospatial data engineer with **6+ years of experience** building **ETL pipelines, geospatial data workflows, and satellite-derived analytics**. Skilled in **Python, SQL, geospatial ETL, remote sensing, and operational feasibility analysis**. I develop **reliable, reproducible pipelines**, dashboards, and analytic products integrating **OSM, GTFS, satellite imagery, and event-based data**. Experienced working cross-functionally in dynamic environments and delivering decision-ready insights that support **planning, monitoring, and collection operations**.

## Core Skills

- **Data Engineering (Python & SQL):** ETL pipelines; workflow automation; reproducible data processing; data modeling; unit-tested analytics; API ingestion.
- **Geospatial ETL & Operations:** GeoPandas, Rasterio, Shapely, GDAL; PostGIS/DuckDB; geospatial QA/QC; large-volume batch processing.
- **Remote Sensing:** Sentinel-2, Landsat; LULC classification; change detection; preprocessing; feature extraction.
- **Feasibility & Operational Analysis:** Spatial/temporal feasibility assessment; accessibility analysis; pattern-of-life; mobility and demand mapping.
- **Visualization & Monitoring:** Streamlit, Plotly, Power BI, ArcGIS Online; dashboards for operational monitoring and decision support.
- **CI/CD & Version Control:** Git, GitHub Actions (familiar); reproducible workflows; testing and documentation.
- **GIS Software & Tools:** QGIS, ArcGIS Pro/Model Builder, OSMnx, Overpy; FAIR metadata and SOP development.

## Professional Experience

**Research Assistant** — Leibniz Institute of Ecological Urban and Regional Development (IOER), Dresden, Germany *Jun 2023 – Nov 2025*

- Engineered **Python- and SQL-based ETL pipelines** (GeoPandas, GDAL, DuckDB) for processing large OSM, GTFS, WFS, and satellite datasets.
- Developed **unit-tested, reproducible workflows** integrating geospatial preprocessing, feature engineering, and ML/analytic pipelines.
- Conducted **geo-temporal mobility analysis** using clustering and anomaly detection; delivered map services and indicators supporting planning tasks.
- Built interactive **Streamlit/Plotly dashboards** supporting operational monitoring and decision-making.
- Authored workflow documentation, metadata, and SOPs aligned with FAIR principles.

**Data Management Officer** — Wildlife Conservation Society, Dhaka, Bangladesh *Apr 2022 – Sep 2022*

- Maintained validated geodatabases and delivered **RS-derived LULC and change detection** products for conservation monitoring.

**Senior Information Management Officer** — iMMAP, Cox's Bazar, Bangladesh *May 2021 – Dec 2021*

- Produced **geospatial intelligence** integrating satellite imagery, surveys, and OSINT data for humanitarian operations.
- Streamlined **classification, feature extraction, and ETL workflows** to accelerate map production.
- Performed **feasibility and access analysis** for planning and coordination.

**GIS Officer** — Danish Refugee Council, Cox's Bazar, Bangladesh *Oct 2020 – May 2021*

- Automated geospatial workflows using **Python and ArcGIS Model Builder**, enabling rapid operational product delivery.
- Improved QA/QC processes for classification outputs and field data.

**GIS/Remote Sensing Expert** — TROYEE Associates, Dhaka, Bangladesh *Dec 2019 – Oct 2020*

- Performed **geospatial feasibility analysis** for infrastructure and land-use planning.
- Supervised GIS analysts; oversaw data processing, QC, and report/map preparation.

**Research Associate** — Bhumijo Limited, Dhaka, Bangladesh *Aug 2019 – Dec 2019*

- Conducted raster/vector analysis for spatial planning and public health; managed survey datasets.

**Project Manager** — Image Research & Consultancy Ltd., Dhaka, Bangladesh *Jan 2019 – Jul 2019*

- Led spatial research projects; supervised fieldwork and produced geospatial analytics for reporting.

**Research Associate** — REACH: IWFM-BUET, Dhaka, Bangladesh *Dec 2017 – Dec 2018*

- Conducted hydrological and geospatial analysis integrating lab, field, and satellite data.

**Junior GIS/Remote Sensing Expert** — Desh Upodesh Ltd., Dhaka, Bangladesh *Sep 2016 – Nov 2017*

- Processed multi-temporal RS/GIS datasets for feasibility and vulnerability assessments; produced analytical maps and reports.

## Selected Projects

**Urban Public Transit Frequency Indicator for Germany (Replication Dataset)** — IOER Research Data Center *Data Manager, 2022–2025*

- Engineered the **end-to-end geospatial ETL workflow** for generating nationwide public transit frequency indicators using GTFS, OSM, and INSPIRE grid datasets.
- Processed **spatio-temporal GTFS feeds** (weekday/Sat/Sun + peak hours) and implemented weekly averaging, mode weighting, and QC routines.
- Applied **network-based interpolation** (QNEAT3, OSM routing) to compute 500 m walk-accessibility and derive 1 km grid frequency layers.
- Produced standardized **GeoPackage datasets, vector grids, and city-level statistics** with FAIR-compliant metadata for publication via IOER-FDZ.
- **Dataset DOI:** [doi:10.71830/ABPCUS](https://doi.org/10.71830/ABPCUS)

**Modeling Urban Fabrics for Net-Zero Intervention (M.Sc. Thesis)** — IOER Dresden *May 2025 – Oct 2025*

- Developed **ETL pipelines** for POI and spatial datasets.
- Applied **Doc2Vec & LDA** for semantic classification of urban fabrics.
- Delivered reproducible workflows and interactive visualizations.

**E-learning Tool for Spatial Change Analysis** — IOER Dresden *Jan 2025 – Apr 2025*

- Integrated WFS, OSM, Sentinel-2, and GHSL datasets via OWSLib, Overpy, and GEE Python API; automated geoprocessing pipeline.
- Built web visualizations for settlement and mobility-change analysis.

**Public Transit & Land-Use Dynamics Visualization** — IOER Dresden *Jun 2023 – Dec 2024*

- Processed GTFS, OSM, and satellite imagery for accessibility and LULC dynamics.
- Designed interactive dashboards for researchers.

**Climate Extremes Analysis Using CORDEX/ERA5-Land** — TU Dresden *Apr 2023 – Sep 2023*

- Applied Python, NetCDF4, and CDO to calculate and visualize climate extreme indices.

## Education

**M.Sc. in Hydro Science & Engineering** — TU Dresden, Germany *Oct 2022 – Nov 2025*  
Thesis: *Modeling Urban Fabrics to Activate Net-Zero Intervention*

**Bachelor in Urban & Regional Planning** — KUET, Bangladesh *Feb 2012 – Jul 2016*  
Thesis: *Investigating Coastal Livelihoods in Relation to Land-use/Land-cover Change Modeling*

## Certifications

**AI School: Scalable Data Analytics & HPC** — ScaDS.AI Leipzig (2023)

**AI School: Deep Learning, Data Visualization & LLMs** — ScaDS.AI Leipzig (2025)

**Citizenship:** Bangladesh | **Work Authorization:** Germany (convertible to work visa)

**References:** Available upon request