



## CONTACT

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## EDUCATION

2017-2019

Master of Engineering | ISRO, India

Remote Sensing and GIS

Published peer-reviewed research in international journals and conferences

2016-2017

Post Graduate Diploma | CDAC, India Biomedical

Instrumentation and Informatics

Specialisation in IoT, Geo-Informatics, and Health Informatics

2011-2016

Bachelor of Engineering | RTU, India

Electronics and Communication Engineering

Specialisation in Embedded Systems, IoT Applications, and Electronic Circuit Design

## EXPERTISE

- Remote Sensing & GIS Analysis
- SAR Data Processing & InSAR Techniques
- Python Workflow Automation
- Change Detection & Trend Analysis Geospatial
- Tool & Dashboard Development Scientific
- Writing & Research Coordination Time-Series
- Modelling
- Cloud-Based Data Processing
- Geo-Intelligence Analysis

# UDIT ASOPA

## DATA & ANALYTICS PROFESSIONAL | GIS AND REMOTE SENSING SPECIALIST

PYTHON • SQL • POWER BI • GEOSPATIAL ANALYTICS • MACHINE LEARNING • DATA STORYTELLING

## PROFILE

I am a data and analytics professional with over five years of experience in geospatial intelligence, remote sensing, and Earth observation-based product development. I specialize in transforming complex datasets into actionable insights through Python automation, statistical modeling, and data visualization. My experience spans satellite data analytics, SAR processing, and environmental monitoring, where I have built scalable workflows for change detection, time-series analysis, and decision-support tools used in disaster response and risk assessment. I value clarity, reproducibility, and collaboration, and take pride in delivering data-driven solutions through structured problem-solving and cross-functional teamwork. Passionate about applying data science to real-world challenges, I am continuously expanding my skills at the intersection of analytics, technology, and environmental intelligence.

## WORK EXPERIENCE

### ICEYE Oy, Finland

DEC 2021 - PRESENT

Data Analyst / Remote Sensing Engineer (official title: SAR Remote Sensing Engineer)

*SAR data processing, geospatial analytics, insight product development, and environmental monitoring using remote sensing. Workflow automation, change detection, trend analysis, and statistical modeling for crisis response. Visual reporting and spatial outputs for decision support. (Python, SAR, QGIS, ESRI ArcGIS, GDAL, Power BI)*

### Freelance Geospatial Data Analyst

MAY 2021 - NOV 2021

*Web-based geospatial application development, spatial analysis, and environmental monitoring using satellite data. Storytelling with maps, indicator dashboards, and remote sensing analytics for stakeholder engagement. (Google Earth Engine, QGIS, JavaScript, Python)*

### Delft University of Technology, Netherlands

APR 2020 - APR 2021

Remote Sensing & GIS Researcher

*InSAR time-series analysis, geospatial modeling, and cloud-enabled automation for ground deformation monitoring. Research documentation, training coordination, and reproducible workflow development in a multidisciplinary team. (Python, Bash, QGIS, Sentinel-1, Jupyter)*

### Indian Institute of Technology, India

SEPT 2019 - FEB 2020

Jr. Remote Sensing & GIS Researcher

*SAR feature extraction, polar remote sensing, and field-based environmental data collection for cryosphere research. Integration of in-situ snow observations with satellite imagery to support geophysical modelling. (Sentinel-1, RADARSAT, QGIS, Python)*

## CERTIFICATES & COURSES



Project Management: Beyond planning and control  
Politecnico di Milano || March 2025



Introduction to Git and GitHub  
Google || Jan 2025



Introduction to Data Science in Python  
University of Michigan || Jan 2024



Machine Learning with Earth Engine  
Udemy || April 2020



Object Parameter Estimation and Discrimination Using Hyperspectral Data  
Geo University || Sept 2018

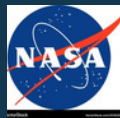


IEEE Norway GRSS School AMERSIE 2020  
IEEE GRSS || Nov 2020



ISPRS Technical Commission V Education & Outreach - Publication  
ISPRS TC V || Nov 2018

Humanitarian Applications Using  
NASA Earth Observations  
June 2022



Forest Mapping and Monitoring with  
SAR Data  
May 2020

SAR for Disasters and Hydrological  
Applications  
Dec 2019

## ONGOING COURSES



IBM RAG and  
Agentic AI  
Professional  
Certificate



Machine Learning  
for Computer  
Vision



IBM Machine  
Learning



Introduction  
to Data  
Analytics



Artificial  
Intelligence:  
Concepts



AWS Cloud  
Solutions  
Architect

## AWARDS



Highest Impact  
Making Team  
Award || July  
2025



Harnessing Copernicus  
Foundation Models  
|| BiDS 2025, Riga

## PROJECTS

### Disaster-GeoRAG: AI that knows when to say 'uncertain'

Big Data from Space 2025 - Conference, Riga || Oct 2025

Built an AI-driven Retrieval-Augmented Generation (RAG) system for disaster detection and triage on satellite imagery, integrating vision-language modeling, retrieval pipelines, and explainable AI. Designed a compact disaster taxonomy and knowledge base from Copernicus EMS and NASA Earthdata, enabling structured predictions with confidence scoring and rationale citation. Developed the end-to-end workflow in Python using Hugging Face, FAISS, and Qwen, with a Gradio interface for real-time disaster classification and Q&A. Demonstrated transparent, uncertainty-aware AI for rapid crisis response and geospatial analytics. (*Python, PyTorch, Hugging Face, FAISS, Sentence-Transformers, Gradio, RAG, Vision-Language Models, Explainable AI, Satellite Imagery, Geospatial Analytics, Data Science*)

### Hurricane Damage Assessment Product

ICEYE Oy || May 2024 - Present

Development and operational delivery of ICEYE's SAR-based hurricane damage assessment product used for rapid disaster response and impact mapping. The product provides building- and neighborhood-level damage heatmaps (30 m raster, 500 m hexgrid) within 24 hours of hurricane landfall, distinguishing between wind and flood impacts. My role includes SAR image analysis, change detection modeling, and automating data pipelines to produce scalable, GIS-ready outputs for government, insurance, and humanitarian stakeholders. I also contribute to visual QA, damage index calibration, and improving detection confidence using statistical methods. (*Python, Jupyter, Shell, Linux, SAR, GDAL, ArcGIS Pro, Power BI, Google Earth Engine*)

### Wildfire Insights Product

ICEYE Oy || April 2022 - May 2024

Development and operational support for ICEYE's SAR-based Wildfire Insights product, delivering near-real-time monitoring and building-level damage assessments within 24 hours of wildfire ignition. Contributed to the processing of wildfire-affected areas using SAR data, supporting product development through geospatial analytics, database management, and statistical modeling. Maintained and enhanced the wildfire monitoring application built with ArcGIS Experience Builder, integrating live perimeters, structure-level impacts, and user feedback layers. Implemented automation using Bash scripts and Python for efficient data handling, and supported data integration with PostGIS-based databases for spatial analytics. Enabled structured delivery of GIS-ready outputs to emergency, insurance, and public-sector clients. (*Python, Bash, SAR, ArcGIS Pro, ArcGIS Experience Builder, GDAL, PostGIS, QGIS, JavaScript, SQL*)

### Forest Structure Modelling

Beyond Dead Wood Hackathon || March 2024

Processed airborne LiDAR point cloud data to generate high-resolution digital terrain models (DTMs) and 3D forest structural layers. Estimated canopy heights by integrating very high-resolution DEMs with LiDAR-derived surface and ground returns. The workflow combined QGIS-based spatial visualisation and Python scripting for automated data filtering, raster generation, and canopy metrics calculation. Results supported advanced forest structure analysis and topographic mapping. (*LiDAR, QGIS, Python, VHR DEM, Raster analysis*)

## PUBLICATIONS

### *Songklanakarin Journal of S & T | 2022*

Assessing the role of LULC change in inducing UHI in Jaipur district, Rajasthan, India:  
A case study from 2009-2019

### *Advances in Space Research | 2021*

Polarimetric calibration of spaceborne and airborne multifrequency SAR data for scattering-based characterisation of manmade and natural features

### *AGU fall meeting | 2020*

Monitoring and modelling land subsidence due to hydrocarbon production, integrating geodesy and geophysics

### *Earth and Space Science | 2020*

UAVSAR Tomography for Vertical Profile  
Generation of Tropical Forest of Mondah National Park, Gabon

### *Unmanned Aerial Systems in Geomatics, India | 2019*

Multi-Frequency Polarimetric Decomposition of UAVSAR Data

### *2nd International Electronic Conference on Geosciences, MDPI | 2019*

Land Subsidence Monitoring in Jagadhri City  
Using Sentinel 1 Data and DInSAR Processing

### *International Society for Photogrammetry & Remote Sensing, India | 2018*

PSInSAR Study of Lyngenfjord Norway, using TerraSAR-X Data

## PROFESSIONAL SKILLS

Insightful data storytelling

Technical writing & documentation

Workflow automation & reproducibility

Stakeholder-focused analysis

Applied domain modelling

Cross-functional collaboration

Quality control & validation

Data-driven decision support

Spatial and temporal data integration

Data visualisation & dashboarding

Exploratory data analysis (EDA)

Statistical reasoning

Research-method alignment

Predictive modelling & hypothesis testing

Machine learning experimentation & evaluation

Feature engineering & data preprocessing

Model interpretation & performance tracking

Business problem framing & KPI analysis

Data pipeline optimisation & automation

Communication of insights to non-technical audiences

## PROJECTS

### **Environment Monitoring applications on GEE** Independent Project || May - Nov 2021

Designed and developed multiple web-based geospatial applications using Google Earth Engine to visualize and analyze environmental changes. Applications included oil spill detection using Sentinel-1 SAR data, forest cover change monitoring with Landsat and Sentinel-2 imagery, and land surface temperature anomaly mapping with MODIS datasets. Built time-series visualizations, threshold-based classification models, and interactive dashboards for real-time user interaction. These apps enabled dynamic exploration of spatial and temporal trends for both scientific and public audiences. (*Google Earth Engine, JavaScript, Sentinel-1, Sentinel-2, MODIS, Landsat, Remote Sensing*)

### **Taal Volcano eruption analysis with Sentinel-1 SAR Data** Independent Project || 2021

Processed Sentinel-1 SAR data to analyze surface deformation caused by the Taal volcano eruption. Generated radiometrically terrain corrected (RTC) backscatter images and created LOS interferograms to detect displacement patterns. Conducted comparative analysis between line-of-sight (LOS) displacement and perpendicular displacement components to evaluate deformation directionality and magnitude. The workflow included InSAR processing, gamma corrections, and spatial analysis of volcanic impact zones. (*Sentinel-1, InSAR, LOS Displacement, QGIS, Python, RTC, GAMMA, Remote Sensing*)

### **Subsidence Monitoring in Groningen, NL using InSAR** Delft University of Technology || April 2020 - April 2021

Developed cloud-enabled Python and Bash-based workflows to process Sentinel-1 SAR imagery for time-series InSAR analysis of ground subsidence in the Groningen region of the Netherlands. Focused on detecting long-term geophysical deformation patterns related to gas extraction. Managed data ingestion, interferogram generation, and displacement modelling in a reproducible pipeline, supporting research transparency and long-term monitoring. Also led documentation, reporting, and internal team training. (*Sentinel-1, InSAR, Python, Bash, GCP, QGIS, Jupyter*)

### **Cryosphere Feature Mapping using SAR in Polar Regions** Indian Institute of Technology, India || Sept 2019 - Feb 2020

Mapped and analysed cryospheric surface features, including fern line delineation, using Sentinel-1 and RADARSAT SAR data for Greenland and Svalbard. Applied classification techniques to distinguish surface types under polar conditions. Planned and coordinated a high-altitude field campaign in the Indian Himalayas, collecting in situ snow parameters to support model validation. Integrated field observations with satellite-derived measurements to improve geophysical modelling accuracy. (*Sentinel-1, RADARSAT, SAR Classification, QGIS, Python, Snow Parameter Analysis*)

### **Environment Monitoring & Research with EO and GIS** Indian Institute of Remote Sensing (IIRS), ISRO || 2017 - 2019

Conducted research on radar remote sensing and environmental change monitoring as part of the M. Eng. thesis at IIRS. Developed workflows for SAR data processing, time-series analysis, and geospatial modelling, focusing on geophysical and ecological applications. Participated in national and international conferences, including AGU Fall Meeting and IECG (MDPI), and published peer-reviewed articles in *Advances in Space Research*, *Earth and Space Science*, and other journals. Experience included supervised classification, accuracy assessment, integration of SAR and optical data, and communication of research findings through scientific presentations and reports. (*Sentinel-1, SAR, QGIS, Python, ERDAS, Remote Sensing, Environmental Modelling*)

# TRANSFERRABLE SKILLS

- Curiosity and continuous learning
- Clear and adaptive communication
- Proactive ownership and accountability
- Attention to detail and data accuracy
- Critical and analytical thinking
- Collaboration in cross-functional teams
- Adaptability in dynamic, fast-paced environments
- Feedback-driven personal and professional growth
- Cultural and interdisciplinary fluency
- Resilience and composure under ambiguity
- Time, priority, and stakeholder management
- Empathy and active teamwork
- Creativity and comfort with experimentation
- Clarity and focus under pressure

# LANGUAGE

- English : Full Professional Proficiency
- Hindi : Native Speaker
- Swedish : A2, Beginner proficiency
- Finnish : A1, Beginner proficiency

# TECHNICAL SKILLS

Remote Sensing & GIS	SAR processing, InSAR time-series analysis, Change detection, Optical remote sensing, Geospatial modeling, Satellite data integration, Google Earth Engine, ArcGIS Pro, ArcGIS Online, QGIS, SNAP, FME, GDAL, Rasterio
Programming & Scripting	Python (pandas, numpy, geopandas, matplotlib, seaborn, scikit-learn, rasterio), SQL, Bash scripting, JavaScript (GEE), Jupyter Notebooks, GitHub, VS Code
Data Analysis & Visualization	Statistical modeling, Predictive analytics, Machine learning (classification, regression, clustering), Feature engineering, Time-series analysis, Hypothesis testing, Data preprocessing, Model evaluation, Power BI, Tableau, Excel
Cloud & Platforms	AWS, Google Cloud Platform (basic), JupyterHub, GitHub, VS Code, Docker (basic), Databricks (basic)
Tools & Software	ArcGIS Suite, QGIS, FME, GDAL, SNAP, Power BI, Git, Visual Studio Code, JupyterLab, PostgreSQL / PostGIS (basic)

# INTEREST & HOBBIES

🧠 Strategic Play & Games  
Board games like Cartographers, Carcassonne, and Distilled 🧑 | Chess ♔ | UNO 🃏 — *enjoy logic, creativity, and thoughtful competition*

🏏 Sports & Outdoor Activities  
Cricket 🏏 | Volleyball 🏐 | Badminton 🏸 | Table Tennis 🏓 | Learning Tennis 🎾 & Ice Skating 🛼 | Trail Running 🏃 | Biking 🚲 | Sauna 🧖 — *staying active and balanced through sports and movement*

🌿 Nature & Exploration  
Hiking 🥾 | Waterfalls 💧 | Photography 📷 | Visiting UNESCO Sites 🏛️ and National Parks 🌲 | Passion for Renaissance and Old English architecture 🏰 — *love connecting with nature and culture*

📖 Curiosity & Learning  
Non-fiction reader - inspired by authors like Ed Yong and Richard Feynman | Fascinated by science storytelling and perspective-shifting ideas 🌍

🍰 Culinary Exploration  
Cooking and baking enthusiast 🍳 | Eternal pizza lover 🍕 | Enjoy exploring global cuisines 🍜🍱 and the cultural stories behind them.