AMGOTH PAVAN KUMAR

📞 +91-7569895952 | ✉ amgothpavankumaar@gmail.com | 🌐 Portfolio | in LinkedIn | ⌂ GitHub

Education

IRD - Institut de Recherche pour le Développement   Sep 2025 – Aug 2028
Doctoral student, CESBIO

Indian Institute Of Science   Aug 2023 – May 2025
M-Tech Climate and Earth Sciences (CAOS)   CGPA: 8.1/10

Rajiv Gandhi University of Knowledge Technologies   Jul 2019 – May 2023
B-Tech Civil Engineering   CGPA: 8.17/10

Technical Skills

Category	Skills	Proficiency
Languages & Tools	Google Earth Engine	●●●●○
	QGIS & ArcGIS	●●●●○
	Python Programming	●●●○○
Remote Sensing & Data Analysis	Python Geospatial	●●●○○
	Microsoft Office	●●●○○
	Time Series Analysis	●●●○○
Machine Learning Frameworks	PyTorch & OpenCV	●●●○○
	TensorFlow & Keras	●●●○○
	Scikit-learn & Scipy	●●●○○

Experience

Junior Research Fellow (JRF)   July 2025
Interdisciplinary Centre for Water Research, IISc   **(Completed)**

- Contributed to a hydrological research project focused on reconstructing Terrestrial Water Storage Changes (TWSC) using a storage budget framework (I - Rb - T) across 91 global basins.
- Performed comparative analysis of multiple baseflow and transpiration separation methods using performance metrics like NSE and RMSD to evaluate closure accuracy against GRACE-based TWSC.
- Developed Python-based workflows for time series processing, basin-wise validation, and visualizations to support model selection and uncertainty assessment.

Climate Research & Data Analysis Intern   Jan - Mar 2025
Dygnify Ventures Pvt Ltd, Remote   **(Completed)**

- Processed and analyzed complex geospatial datasets, including GeoTIFF, NetCDF, Cloud-Optimized GeoTIFFs (COGs), and historical climate datasets, to derive actionable insights for climate resilience initiatives.
- Designed and developed an automated data pipeline for a Flood Risk Assessment Model, leveraging Google Earth Engine (GEE) and Python API to enable scalable flood predictions across diverse locations in India using historical precipitation, topography, and land-use datasets.
- Conducted advanced remote sensing analysis to interpret and calculate Heat Stress Indices (e.g., Wet Bulb Globe Temperature, Heat Index) for multiple regions in India, integrating historical meteorological data to forecast future heatwave events with statistical modeling and time-series analysis.

Academic Projects

Assessing the accuracy of Infiltration and Baseflow Estimates Using GRACE   May 2025
Dr.-Ing. Bramha Dutt Vishwakarma (ICWaR & CEaS, IISc)   **(Completed)**

- Calibrated the nonlinear storage-discharge relationships within a circuit analogy framework by developing a novel integration of circuit analogy models with GRACE Satellite data to estimate Infiltration.
- Computed water storage anomalies using advanced signal processing techniques—including the Hilbert transform and Fourier-based time shifting—to synchronize hydrological signals.
- Identifying the dynamics of Infiltration and Base-flow with precipitation and water storage change respectively.

NDVI: Analysis Using Remote Sensing & GIS of Nirmal District   May 2023
Dr.Vinod Bukya (Department of Civil Engineering, RGUKT)   **(Completed)**

- Analyzed NDVI trends in Nirmal district, Telangana (2005–2023) using high-resolution Landsat imagery and MODIS data to monitor forest and land use land cover dynamics and seasonal variations.
- Evaluated key drivers of vegetation change, including urban expansion and anthropogenic impacts, through integrated remote sensing and geospatial analysis.
- Developed spatial models that provided insights into vegetation trends, supporting evidence-based recommendations for sustainable land management.

Relevant Coursework

- **Probability & Statistics**
- **Remote Sensing & GIS**
- **Machine Learning**
- **Geodetic Signal Processing**
- **Deep Learning**
- **GeoAI**

Course Projects

Building Classification for Seismic Risk Assessment   Sep 2024 – Nov 2024
Dr. Punit Rathore (RBCCPS, IISc)   **(Completed)**

- Developed and deployed a machine learning pipeline utilizing Google Street View imagery to evaluate building structural integrity and classify seismic vulnerability for earthquake-prone urban areas.
- Implemented YOLOv8n for real-time object detection to identify building features, and fine-tuned YOLOv8n-cls and ResNet50 for multi-class classification, optimizing hyperparameters using cross-validation and transfer learning to enhance model accuracy on a curated dataset.
- Achieved 2nd place in a Kaggle competition by securing a top-tier F1-score and Intersection over Union (IoU), showcasing the model's scalability and precision in seismic risk assessment and urban resilience planning.

Enhancing Vegetation Classification through Hyperspectral Remote Sensing Feb 2024 – Apr 2024
Dr. Debsunder Dutta (Department. of Civil Engineering, IISc)   **(Completed)**

- Developed a machine learning framework to classify hyperspectral remote sensing imagery, integrating Principal Component Analysis (PCA)-enhanced Support Vector Machines (SVM) and Random Forest (RF) models to map vegetation types using the Indiana Pines dataset.
- Applied PCA for dimensionality reduction of high-dimensional hyperspectral bands and improving classification accuracy by preserving spectral variance.
- Benchmarked results against CNNs and (k-NN, demonstrating the efficacy of PCA-SVM-RF pipeline in computational efficiency and predictive power for remote sensing applications.

Training & Workshops

Graph Theory and Machine Learning   Nov 2024
Department of Computational & Data Sciences, IISc

- Explored key topics such as Random Walks, Graph Cuts, and Graph Convolution Networks through hands-on demos and deep learning optimization techniques.
- Gained proficiency in implementing state-of-the-art deep learning models using frameworks like PyTorch and TensorFlow, with a focus on optimizing performance for large-scale graph data.

Training on Glacier studies and Remote Sensing   Jun 2024
Divecha Centre for Climate Change, IISc

- Conducted practical sessions using the HIGHTIM tool to accurately estimate glacier depth and volume, integrating remote sensing data for enhanced spatial analysis.
- Incorporated an improved accumulation-area-ratio (IAAR) method for robust glacier mass balance assessment, contributing to a more precise evaluation of glacier health.

Online Courses & Certifications

- Microwave Remote Sensing in Hydrology from Centre for Remote Sensing, University of Florida Department of Agricultural and Biological Engineering (2025).
- The Big Data Analysis for Water-Related Applications from United Nations University (2024).
- Spatial Data Management with Google Earth Engine from United Nations University (2024.)
- Python for Data Science and Machine Learning Bootcamp from Udemy (2023).
- Google Earth Engine for Machine Learning & Change Detection from Udemy (2023).
- Geospatial Analysis using Google Earth Engine from Indian Institute of Remote Sensing, ISRO (2023).