AMGOTH PAVAN KUMAR

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Education

IISc Bengaluru (2023 - 2025)	M.Tech in Climate and Earth Sciences	Current CGPA: 8.30/10
RGUKT Basar (2019 - 2023)	B.Tech in Civil Engineering	CGPA: 8.13/10
RGUKT Basar (2017 - 2019)	Pre - University Course	CGPA: 8.41/10

Technical Skills

Programming Languages: Python (Advanced) ●●●●○, C ●●○○○

Machine Learning Framework: PyTorch ●●●●○, TensorFlow ●●●○○, OpenCV ●●○○○

Data Analysis: Time Series Analysis ●●●○○, Statistical modeling ●●●○○

Other Tools: Git ●●●○○, Google Cloud Platform ●●●○○, Amazon Web Services ●●●○○

Relevant Coursework

- Probability and Statistics
- Mathematical Methods
- Decision Models
- Machine Learning
- Deep Learning
- Data Mining
- Data Structures & Algorithms
- Data Analysis for Earth Science
- Deep Learning for Computer Vision

Experience

Climate Research & Data Analysis Intern Jan 2025 – March 2025

Dygnify Ventures Pvt Ltd, Remote

- 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.
- Managed and optimized large-scale geospatial data workflows using Google Cloud Services (GCS Buckets), ensuring efficient storage, retrieval, and processing of datasets in formats like ZARR and HDF5.
- Applied machine learning techniques (e.g., Random Forest, LSTM) to historical datasets for predictive modeling of environmental phenomena, improving accuracy in climate risk projections.

Key Projects

Building Classification for Seismic Risk Assessment Sep 2024 – Nov 2024

- 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.
- mplemented 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.
- Leveraged PyTorch and TensorFlow frameworks for model training, integrating mixed-precision training and gradient clipping to accelerate convergence and reduce computational overhead on GPU resources.
- Performed feature extraction and dimensionality reduction using PCA and t-SNE to analyze high-dimensional image embeddings, ensuring effective discrimination of structural risk categories.
- 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

- 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 and Linear Discriminant Analysis (LDA) for dimensionality reduction of high-dimensional hyperspectral bands, mitigating the curse of dimensionality and improving classification accuracy by preserving spectral variance.
- Benchmarked results against Convolutional Neural Networks (CNNs) and k-Nearest Neighbors (k-NN), demonstrating the efficacy of PCA-SVM-RF pipeline in computational efficiency and predictive power for remote sensing applications.