

Prahlada Varada Mittal

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Areas of Interest : Computational Modeling, Remote Sensing, Geodynamics, Seismology, Petrophysics, Machine Learning

EDUCATION

Australian National University, Australia

Masters Thesis in Geodynamics, RSES
Future Research Talent Award

Jun 2024 - Jun 2025

Indian Institute of Technology Roorkee, India

Integrated Masters (B.Tech + M.Tech) in Geophysical Technology
CGPA: 8.72/10.0 (Within top 15 %)

Aug 2020 - Jun 2025

National University of Singapore, Singapore

Academic Internship in Deep Learning and Data Analytics
Grade A (Training from NUS & HPE)

Dec 2022 - Jan 2023

Scholar's Academy, Roorkee (CBSE), India

Higher Secondary Education
Grade 12 Percentage : 93 % (2nd in School)

Apr 2020

Scholar's Academy, Roorkee (CBSE), India

Secondary Education
Grade 10 Percentage : 92 % (2nd in School)

Apr 2018

JOURNAL PUBLICATIONS

Unsupervised learning framework for region based damage assessment on xBD, a large satellite imagery

Published Jun 2023

PV Mittal, R Bafna, A Mittal

Pg 1619-1643, Vol 118, Natural Hazards, Springer (2023) | [Link to Paper](#)

- Population-based damage assessment due to natural hazards
- Unsupervised density-based clustering algorithm to give us the region-based damage
- Development of navigation system integrated with Google maps to aid navigation during a disaster

Machine Learning Models for Mining Social Media Data for Effective Natural Disaster Assessment

Jun 2024

PV Mittal, S Karki, S Parasher, S Narang, A Mittal

Natural Hazards Review, ASCE (In Review) | [Link to Paper](#)

- Creating an integrated text and image based framework for damage assessment
- Provision of timely and customized aid to the affected individuals
- Deducing damage types and analysing them

From Field to Diagnosis: Leveraging Farmer Query to Detect Crop Diseases in a Changing Climate

Sept 2024

DS Rawat, A Agarwal, PV Mittal, A Mittal, N Yeril

IEEE Transactions on AgriFood Electronics (In Review)

- Creating a labelled dataset using N-grams and SMEs
- Using ML algorithms for crop-disease identification
- Correlating the diseases with climate-induced environmental factors
- Aiding farmers and government by providing customised help

CONFERENCES

Natural Disaster Twitter Data Classification using CNN and Logistic Regression

Aug 2023

S Parasher, *PV Mittal*, S Karki, S Narang, A Mittal

International Conference on Soft Computing for Problem Solving (SocProS 2023), Aug 11-13, 2023

[Link to Paper](#)

- Efficient damage assessment using social media data by classification
- Panic assessment in the general populous
- Swift assistance during natural disasters

Integrating GRACE Satellite Data and ML for Groundwater Level Analysis and Prediction in UP

Mar 2024

M Sharma, *PV Mittal*, K Raj, A Karunakalage, M Taqi Daqiq, R Sharma

International Conference on Computations and Data Sciences(CoDS-2024), March 8-10, 2024

- Using the widely available GRACE data to find out the Groundwater level dependence on storage
- Use of Machine Learning tools to find out relationships and prediction groundwater levels for similar geologies
- Finding out the geological implications

RESEARCH PROJECTS

Constraining mantle properties by inverting for observations of dynamic topography

Jun 2024 - Jun 2025

Dr. Sia Ghelichkhan, Prof. Rhodri Davies (Australian National University)

- Use of Dynamic Topography observations to get viscosity and density of mantle
- Synthetic modeling using Finite Element method and Stokes' equations
- Adjoint-based inversion to get viscosity and temperature sensitivities

Image Super-Resolution Using SRCNN and ESRGAN

Dec 2022 - Jan 2023

Dr. Amirhassan Monajemi (National University of Singapore)

- Low-resolution or low-quality images taken as input
- Deep learning models applied and compared with respect to various parameters
- Tested using Image quality metrics like PSNR, MSE and SSIM

Time-series analysis and feature extraction of past LPT signals from Aso Volcano Japan

Apr 2023 - Sep 2023

Prof. Alex Song, University College London

- Forecasting of volcanic events based on similar previous seismic unrest and features
- Analysis of factors which are more prominent during volcanic tremors by feature extraction

RMT and TEM Modelling of HFT Zone

Mar 2023 - Apr 2023

Prof. Bülent Tezkan (University of Cologne), Prof. M Israil (IIT Roorkee)

- Use of Radio Magnetotellurics and Transient Electromagnetic methods
- Processing and Modelling the data to get 3-D structure

Analysis of Seismic Records of North-East India

Sep 2022 - Oct 2022

Prof. Sagarika Mukhopodhyay (IIT Roorkee)

- Estimating earthquake arrivals by the large North-East dataset and determining earthquake location
- Used Seisan software to analyse our results

TECHNICAL SKILLS

Programming languages : Python (Expert), C++ (Competent), MATLAB (Competent), R (Basics)

Softwares and Tools : Jupyter Notebook, Firedrake, Paraview, MS Azure, MS Excel, LATEX, Orange

Python Lib : OpenCV, Numpy, Pandas, SciPy, Scikit-learn, Matplotlib, Pyvista, Pyadjoint, PetSc, Tensorflow

Geophysics : GAdopt, ObsPy, GPlates, QGIS, Rokdoc, GMSH, Seisan, Res3DInv, KiKNet

RELEVANT COURSEWORK

Computer Programming(C/C++)	Digital Image Processing	Economics
Machine Learning for Engineers	Plate Tectonics	Seismology
Strong Motion Seismology	Numerical Modelling	Well-logging
Probability and Statistics	Geoinformatics	Hydrology
Multi-dimensional Mechanics	Signal Processing	Field Theory
Physical and Structural Geology	Marine Geophysics	Petrophysics
Multi-variable Calculus	EM Prospecting	Field Training
Fundamentals of Electronics	Economic Geology	Geology of India

EXTRACURRICULAR ACTIVITIES

Student Mentor, SMP, IIT Roorkee: Mentoring and Guiding First Year Students	Sep 2023 - Apr 2024
Mentor in Workshops at IIT Roorkee, COER Univ and KRM Univ: Workshops on QGIS, ML, Orange	Jul 2023 - Jun 2024
Mentor, Raman Classes, Roorkee: Mentoring and Teaching students for IIT-JEE and Python	Jan 2021 - Jul 2023
Member, Marketing and Development, Raman Classes, Roorkee: Marketing, Course Preparation	Jan 2021 - Aug 2022
Participant, Hamrock Cricket Tournament, IIT Roorkee: Bowling allrounder – helped team secure a 2nd place finish	Feb 2024 - May 2024
Participant, Institute Open Championship, IIT Roorkee: Participant in Badminton Championship - Singles	March 2023, 2024
Participant, Inter IIT Trials, IIT Roorkee: Participant in Squash and Table Tennis	September 2022
Member, National Sports Organisation, IIT Roorkee: Working to increase interest of youth in sports	Dec 2020 - Dec 2021

REFERENCES

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