Shivika

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Areas of Interest : Applied Geophysics, Seismic Waveform Modelling, Machine Learning, Time-Series Analysis, Petrophysics, Image Processing

Education

Indian Institute of Technology Roorkee, India Nov 2020 - Jun 2025
Integrated Masters of Technology in Geophysical Technology (Major: **Geophysics** | Minor: **Management**)
CGPA: 8.76/10.0

Bhagwanti Saraswati Vidya Mandir IC Muzaffarnagar (UP Board), India Apr 2019
Higher Secondary Education
Grade 12 Percentage : 84.4 % (2nd in District)

Bhagwanti Saraswati Vidya Mandir IC Muzaffarnagar (UP Board), India Jun 2017
Secondary Education
Grade 10 Percentage : 90.5 % (1st in District)

Research Projects

Seismic Waveform Modeling with a Bayesian Framework (Master's Project) Aug 2024 - Present
Prof. Simanchal Padhy, IIT Roorkee

- Developing a Bayesian based model to analyze and detect weak seismic events through seismic waveform modeling using Python
- Utilizing waveform analysis techniques to enhance the detection and characterization of seismic events
- Applying Bayesian inference methods to improve the accuracy and reliability of waveform-based monitoring systems

Advanced Borehole data Processing to assess Water Saturation in Oil and Gas reservoirs Apr 2024 - Aug 2024
Prof. Ravi Sharma, IIT Roorkee

- Improved estimation of water saturation and hydrocarbon pay in geological formations by comparing traditional methods like Archie's equation
- Developed an automated code for detecting fluid-saturated zones, enhancing the accuracy of saturation estimates
- Applied various saturation equations to calculate water saturation for formations with different types of shale, including dispersed, structural, and laminar shale

Mapping Spatiotemporal Variation of Wheat Phenology in India Using Landsat-8 TimeSeries Data May 2024 - Aug 2024
Prof. Kritika Kothari, IIT Roorkee

- Monitored wheat developmental stages (planting, jointing, heading, maturity) in Haridwar using Landsat-8 data and NDVI curve-based satellite remote sensing with 15-day temporal and 30 m spatial resolution
- Applied Python to detect growth stages based on NDVI derivatives, capturing spatial variations in planting, jointing, heading, and maturity
- Compared results with field data from Roorkee, identifying deviations due tothe lack of consideration of factors like temperature, precipitation, soil conditions, and plant age

Avacado Price Optimisation using OR-Tools Feb 2024 - Apr 2024
Prof. Manu Kumar Gupta, IIT Roorkee

- Applied machine learning models such as Linear Regression, SVM, and Random Forest to enhance price prediction accuracy and forecasting precision
- Utilized OR-Tools, including LP, MILP, and BARON solvers, to tackle both linear and non-linear optimization challenges,optimizing complex decision-making processes

Modelling of HFT Zone through RMT and TEM Feb 2023 - Mar 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

Gravity and Magnetic Survey and Modelling of Mohand Anticline Feb 2023 - May 2023
Prof. Ashutosh Chamoli, IIT Roorkee

- Collecting and Analysis of Gravity and Magnetic Data
- Applying various gravity correction to get the Bouguer anomaly
- Plotting and verification of results with other data and geological information

Seismic Records Interpretation Sep 2022
Prof. Sagarika Mukhopodhyay, IIT Roorkee

- Estimation of earthquake first arrivals in the form of P-waves and S-waves
- Determining the earthquake location using Seisan

Technical Skills

Programming languages : Python (Competent), MATLAB (Competent), C++(Competent)
Competitive Programming : C/C++, Data Structures, Algorithms
Softwares and Tools : Jupyter Notebooks, LATEX, MS Excel, MS Powerpoint, OR-Tools
ML/AI : Numpy, Pandas, Scikit-learn, Seaborn, Matplotlib
Geophysics Skills : Rasterio, Geopandas, Shapely, ArcGIS, Seisan, Res3DInv

Relevant Coursework

Image Processing	Geoinformatics	Earthquake Geology
Strong Motion Seismology	Numerical Modelling	Geophysical Inversion
Geophysical Signal Processing	Computer Programming(C/C++)	Petrophysics
Probability and Statistics	Seismic Prospecting	Petroleum Geoscience
Geophysical Well Logging	EM Prospecting	Electrical Prospecting
Fundamentals of Electronics	Multi-dimensional Mechanics	Field Theory
Multi-variable Calculus	Plate Tectonics	Seismology
Production Management	Financial Accounting	Managerial Economics

Extracurricular Activities

Volunteer, National Service Scheme, IIT Roorkee: Dec 2020 - July 2021
Primary Education Cell

- Empowering underprivileged students in grades 6th to 10th by providing them with free education by teaching Science and Mathematics
- Conducting doubt-solving sessions, tests, and assignments to assess their progress and further stimulate their interest in academics

Hobbies:

- Teaching and mentoring junior students
- Sports: Badminton, Swimming, Cricket, Chess
- Culinary Skills

Address

Shivika Pundir, D/O Sunil Pundir, Gandhinagar, Muzaffarnagar, Uttar Pradesh, India