Abhinav Pratap Singh

PhD Student, Georgia Tech

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Education

Georgia Institute of Technology — *Atlanta, GA*
PhD in Earth and Atmospheric Sciences, CGPA: 4.0/ 4.0 — *Aug 2022 - Present*

Indian Institute of Technology (Indian School of Mines) Dhanbad — *Dhanbad, India*
Integrated MTech in Applied Geophysics, CGPA: 8.93/ 10.0 — *July 2017 - May 2022*

Modern Academy Inter College — *Lucknow, India*
12th grade (High School), 98% (All India Rank: 7) — *July 2007 - June 2017*

Publications

A deep learning approach for joint inversion of DC Resistivity and MT data
A.P. Singh, D. Vashisth, S. Srivastava
82nd EAGE Annual Conference Exhibition, 2021

Petrophysical Inversion of seismic dataset using artificial neural networks
Abhinav Singh, Divakar Vashisth, Anmol Vishwakarma
AGU Fall Meeting Abstracts, 2021

Deep learning for joint geophysical inversion of seismic and MT data sets
Abhinav Pratap Singh, Divakar Vashisth, Shalivahan Srivastava
First International Meeting for Applied Geoscience Energy Expanded Abstracts, 2021

One-Dimensional Seismic Inversion using Machine Learning techniques
P. Singh, D. Vashisth, A. P. Singh
AGU Fall Meeting Abstracts, 2020

Random Forest Regressor for Layered Earth Data Inversion
A. P. Singh, D. Vashisth, S. Srivastava
AGU Fall Meeting Abstracts, 2019

Inversion of MT data using ANN approach
A.P. Singh, D. Vashisth, S. Srivastava
1st Indian Near Surface Geophysics Conference Exhibition, 2019

Other Research Experience and Projects

A scalable and high performance algorithm to obtain earthquake source images using backprojection

Indian Institute of Science, Banglore

Developed a high performance code, scalable to GPUs, to use the rupture propagation images of the earthquakes using the backprojection strategy, modified later into Time reversal algorithm. The codes will be used on virtual seismic traces to get images of the earthquakes after de-Dopplerization of the waveforms.

Magnetotelluric investigation of the composition of the Upper Lithospheric Mantle in Dharwar Craton

National Geophysical Research Institute (NGRI), Hyderabad

Investigated into the conductivity of the lithosphere in the Dharwar Craton and the different conductivity mechanisms that might be involved, and delineating the cause of high conductivity anomaly observed with the data using different rock physics models with the data on the composition of the mantle.

Potential investment opportunity and carbon mitigation measures in South Pelto Area, Gulf of Mexico

SEG EVOLVE' 21

Team Lead of the IIT (ISM) Dhanbad team, combined with IIT Roorkee and the Carbon Capture Coordinator of the combined team. Made contributions to seismic data interpretation and consequently locating reservoirs for investment and CO_2 storage to find the best investment opportunity in the South Pelto Area, Gulf of Mexico.

Litho-facies classification of a 3D section of Parihaka-3D dataset using ANNs

Seismic Facies Identification Challenge- AIcrowd

Developed different Artificial Neural Networks (ANNs) derived models for the facies classification in the given Parihaka dataset. Various features were extracted using various techniques using seismic attributes estimation. The model achieved an accuracy of more than 80% on the test dataset.

Development of GUI- MTTools for MT data processing

National Geophysical Research Institute (NGRI), Hyderabad

Developed a workflow based on Graphic User Interface (GUI) using Python to analyse and process MT data, determination of their dimensionality, as well as the forward and inversion models on the test dataset.

Realisation of the hydrocarbon potential of the Faroe-Shetland Basin

Imperial Barrel Award'21, AAPG

I was the Team Captain of the IIT (ISM) Dhanbad team that participated in the Imperial Barrel Award'21 and worked as a geologist to carry out the literature review to understand the tectonic setting and the stratigraphy of the Faroe-Shetland Basin. Coordinated with the team and led it to carry out the interpretation work on the seismic datasets on Petrel.

Awards and Achievements

- Awardee of **SEG Foundation/Chevron scholarship**, given by Society of Exploration Geophysicists (SEG) for the academic year 2021-22.
- Awardee of **Indian School of Mines Alumni Association North America chapter (ISMAANA) award**, given to top 2 students from the Department of Applied Geophysics, for the academic year 2020-21.
- Awardee of **L Austin Weeks Undergradaute Grant**, granted by American Association of Petroleum Geologists (AAPG)
- Awardee of **Merit-cum-Means Scholarship**, from the Govt. of India consecutively from 2018 to 2021.
- In Switch Energy International Case Competition 2020, organised by Switch Energy Alliance, my team "Lalten" made it to the Finals, and secured the 6th position in the event wherein more than 250 teams registered from all the inhabited continents of the world.
- Awarded school level gold medal in International Mathematics Olympiad (IMO) organised by Science Olympiad Foundation (SOF) for 4 consecutive years, from 2014 to 2017.

Skills

- **Technical Skills**
  - Extensive background in programming in languages like Julia, Python, Matlab, specializing in Scientific computing, Data Visualisation, Data Processing, Machine Learning, and Neural Networks.
  - Well versed in seismic data processing and interpretation softwares like Petrel and OpendTect.
- **Other online courses taken**
  - Machine Learning Course by Stanford University on Coursera
  - Mathematics for Machine Learning Specialization by Imperial College London on Coursera (includes 3 courses)
  - Deep Learning Specialization by deeplearning.ai on Coursera (includes 5 courses)
  - Deeplearning.AI Tensorflow Developer by deeplearning.ai on Coursera (includes 5 courses)
- **Soft Skills** Having managed two clubs, multiple teams and organised numereous events in the college, I have a good experience in teamwork, leadership, and public speaking.
- **Hobbies** Reading and writing (maintaining an blog). A current member of Book Jackers, Gerogia Tech, and a past member of The Book Club and The Literary and Debating Club of IIT (ISM) Dhanbad, LitC
- **Extra-curriculars**
  - Gold Medalist in District Boxing Championship and Inter Hostel Boxing Championship in the lightweight category.

- I was also part of the Tare Zameen Foundation, a non-profit organisation that works for the uplifting of children, women, aged and mentally challenged with a focus on Health, Education, and Empowerment.

Positions of Responsibility

March '20- March '21 President at SEG IIT (ISM) Student Chapter
March' 19- March '20 Vice President at EAGE IIT (ISM) Student Chapter
Aug' 19- Aug '20 Coordinator of Book Club, IIT (ISM) Dhanbad
March '18- March '19 Event Manager at SEG IIT(ISM) Student Chapter