CURRICULUM VITAE

Name: Dr. ARUN SINGH

Present Position: Assistant Professor

Mailing Address: M-205A
Department of Earth Sciences
Indian Institute of Technology Roorkee
Roorkee – 247667
arunsingh2626@gmail.com; arun.singh@es.iitr.ac.in

Personal Details

DOB: 05 January, 1987
Languages: Hindi, English
Father's Name: Mr. N. P. Singh
Mother's Name: Mrs. Pravesh Singh
Permanent Address: C-824, GAUR Homes, Govindpuram, Block E, Ghaziabad, 201013.

Research Interest

Numerical modeling and inversion of magnetotelluric and electrical resistivity tomography data, integrated interpretation of geophysical data and Bayesian inversion techniques.

Education

Ph. D., 2018. Department of Earth Sciences, Indian Institute of Technology Roorkee, Roorkee, India.
Title of Ph. D. thesis: DEVELOPMENT OF MATLAB BASED 3D INVERSION ALGORITHM FOR MT and DCR DATA
Supervisors: Prof. Pravin Kumar Gupta & Prof. M. Israil.

M. Tech., 2014. Geophysical Technology, CGPA: 8.57
Department of Earth Sciences, Indian Institute of Technology Roorkee, Roorkee, India.

B.Sc., 2007. Physics (H), Percentage: 76.81
Sri Venkateswara College, University of Delhi, Delhi.

Sr. Secondary School, 2004. Percentage: 74.20
Delhi Public School, Dadri, G. B. Nagar (C.B.S.E. Board).

Secondary School, 2002. Percentage: 83.40
Delhi Public School, Dadri, G. B. Nagar (C.B.S.E. Board).

Professional Experience

Dec. 2024 – Present: Assistant Professor
Department of Earth Sciences, Indian Institute of Technology Roorkee

Jan. 2021-Dec. 2024: Assistant Professor
Department of Applied Geophysics, Indian Institute of Technology (ISM) Dhanbad

July 2016-Dec. 2020: Geophysicist, Geological Survey of India
Acquisition of field data, processing, and interpretation
(Magnetotelluric, resistivity, gravity, and magnetic).

Professional/Administrative Responsibilities

Organizing Secretary and Treasurer: National conference on "GEOPHYSICAL ADVANCES - NATURAL RESOURCE EXPLORATION, ENERGY SECURITY AND GEOHAZARDS" from 24-26 March 2023 at IIT (ISM) Dhanbad.

Program Coordinator: 7 days training program to be held at IIT (ISM) Dhanbad from 23-29 January under the DST-STUTI scheme.

Faculty Co-coordinator: Geoconfluence-2021 organized by The Geophysical Society, Department of Applied Geophysics, IIT (ISM) Dhanbad.

July 2021-June2023: Warden, Amber Hostel, IIT (ISM), Dhanbad

Sept 2014-June 2016: Assistant Warden, Cautley Bhawan, IIT Roorkee, Roorkee

Soft Skills

Programming Language: FORTRAN, MATLAB, and Python.

Scientific Software: AP3DMT, ModEM, Winglink, Mapros, GRAPHER, GMT, RES2DINV/RES3DINV, Geosoft, ArcGIS

Awards/Scholastic Achievements

Young Scientist, Geological Survey of India, 2018.

CSIR-UGC NET (June 2013) qualified, All India Rank 15

Thesis Supervised

PhD Thesis: 2 ongoing (joint supervision)

Dissertation: 15

Publications

1. **Arun Singh**, Pritam Yogeshwar, Mohammad Israil and Bulent Tezkan. 2D Transdimensional Joint Inversion of Radio Magnetotelluric and Electrical Resistivity Tomography Data. *Geophysical Journal International*, Vol. 239, pp. 1863-1878, 2024.

2. **Arun Singh** and Rahul Dehiya. An Efficient EM Modeling Scheme for Large 3-D Models - A Magnetotelluric Case Study. *IEEE Transactions on Geoscience and Remote Sensing,* vol. 61, pp. 1-11, January 2023

3. Dharmendra Kumar, **Arun Singh**, Mohammad Israil. Necessity of Terrain Correction in Magnetotelluric Data Recorded from Garhwal Himalayan Region, India. *Geosciences*, vol. 11 no 11, pp. 482, November 2021.

4. Anita Devi, Mohammad Israil, **Arun Singh**, and Pravin K. Gupta. Imaging of groundwater contamination using 3D joint inversion of DCR and RMT data: A case study from Northern India. *Near Surface Geophysics,* vol. 18 no. 3, pp. 261-274, January 2020.

5. Anita Devi, Mohammad Israil, **Arun Singh**, and Pravin K. Gupta. Three-dimensional resistivity structure in MCT zone around Chamoli region, Garhwal Himalaya and its seismogenic implication. *Journal of Applied Geophysics*, vol. 178, pp. 1040-60, May 2020.

6. Rahul Dehiya, **Arun Singh**, Pravin K. Gupta and Mohammad Israil. Optimization of computations for adjoint field and Jacobian needed in 3D CSEM inversion. *Journal of Applied Geophysics,* vol. 136, pp. 444-454, January 2017.

7. Rahul Dehiya, **Arun Singh**, Pravin K. Gupta and Mohammad Israil. 3D CSEM data inversion algorithm based on simultaneously active multiple transmitters concept. *Geophysical Journal International*, vol. 209 no. 2, pp. 1004-1017, February 2017.

8. **Arun Singh**, Rahul Dehiya, Pravin K. Gupta and Mohammad Israil. A MATLAB based 3D modeling and inversion code for MT data. *Computers & Geosciences*, vol. 104, pp. 1–11, July 2017.

Conferences

1. **Arun Singh** and Amit Bajpai. Transdimensional Bayesian inversion of 2D magnetotelluric data with static shift. 26th EM Induction Workshop, Beppu, Japan, 2024.

2. Amit Bajpai, Suraj Varma and **Arun Singh**. Hierarchical transdimensional Bayesian inversion of 2D magnetotelluric data. 26th EM Induction Workshop, Beppu, Japan, 2024.

3. Koustav Ghosal, **Arun Singh** and Deepak Gupta. Generalized Data-Driven Radio Magnetotelluric Inversion using Convolutional Neural Network. 26th EM Induction Workshop, Beppu, Japan, 2024.

4. **Arun Singh**, Sharwan Kumar and Amit Bajpai. Hierarchical transdimensional Bayesian joint inversion of magnetotelluric and resistivity data. 34th Conference on Mathematical Geophysics-IUGG, Bombay, India, 2024.

5. Koustav Ghosal, **Arun Singh** and Deepak Gupta. Deep learning-based inversion of radio-magnetotelluric data using Gaussian random fields. 34th Conference on Mathematical Geophysics-IUGG, Bombay, India, 2024.

6. **Arun Singh** and Rahul Dehiya. An efficient 3D magnetotelluric data inversion scheme for large models. 14th Biennial International Conference and Exhibition of Society of Petroleum geophysicist, Kochi, India, 2023.

7. **Arun Singh** and Rahul Dehiya. Development of an efficient 3D inversion algorithm for large-scale MT data. 25th EM Induction Workshop, Çeşme, Turkey, 2022.

8. Rahul Dehiya and **Arun Singh**. An efficient 3D EM modeling scheme based on a radiation boundary approach. 25th EM Induction Workshop, Çeşme, Turkey, 2022.

9. Dharmendra Kumar, **Arun Singh** and Mohammad Israil. Anomalous Phase observed in MT response computed over an Elongated Prism Body: A Synthetic 3D MT Forward Modelling. 25th EM Induction Workshop, Çeşme, Turkey, 2022.

10. **Arun Singh**, Dharmendra Kumar and Mohammad Israil. Joint inversion of magnetotelluric impedance tensor and full distortion matrix. Joint Scientific Assembly IAGA-IASPEI, Hyderabad, India, 2021.

11. Dharmendra Kumar, **Arun Singh** and Mohammad Israil. The Necessity of Terrain Correction in Magnetotelluric Data in Himalayan Region. Joint Scientific Assembly IAGA-IASPEI, Hyderabad, India, 2021.

12. Anita Devi, Mohammad Israil, **Arun Singh**, Pravin K. Gupta, Pritam Yogeshwar and Bulent Tezkan. GW Contamination due to untreated sewage irrigation and waste disposal in Saliyar area delineated using 3D joint inversion of RMT and DCR data- A case Study. 8th International Ground Water Conference, Roorkee, India, 2019.

13. Anita Devi, Mohammad Israil, **Arun Singh**, Pravin K. Gupta. Geothermal inferences drawn

from 3D inversion of Magnetotelluric Data recorded from Chamoli region, Uttarakhand, India. 24th ElectroMagnetic Induction Workshop, Helsingør, Denmark, 2018.

14. Mohammad Israil, **Arun Singh**, Anita Devi, Pravin K. Gupta, and Mohammad Israil. MATLAB based code for 3D joint inversion of Magnetotelluric and Direct Current Resistivity imaging data. 24thElectroMagnetic Induction Workshop, Helsingør, Denmark, 2018.

15. Mohammad Israil, Anita Devi, **Arun Singh** and Pravin K. Gupta. 3D Geoelectrical model of Sub-Himalayan Region – A Magnetotelluric study. 12th Biennial International Conference and Exhibition of Society of Petroleum geophysicist, Jaipur, India, 2017.

16. **Arun Singh**, Nitin Kumar, Pravin K. Gupta, and Mohammad Israil. A MATLAB based 3D modeling and inversion code for MT data. 23rd ElectroMagnetic Induction Workshop, Chiang Mai, Thailand, 2016

17. Pravin K. Gupta, Rahul Dehiya, **Arun Singh** and Mohammad Israil. Efficient computation of adjoint field for 3D CSEM inversion. 23rd ElectroMagnetic Induction Workshop, Chiang Mai, Thailand, 2016.

18. **Arun Singh**, Rahul Dehiya, Pravin K. Gupta and Mohammad Israil. Development of block Inversion algorithm and its comparison with cell inversion schemes. 22nd ElectroMagnetic Induction Workshop, Weimar, Germany, 2014.

19. Rahul Dehiya, **Arun Singh**, Pravin K. Gupta and Mohammad Israil. Interpretation of CSEM data using 2D block inversion algorithm. 22nd ElectroMagnetic Induction Workshop, Weimar, Germany, 2014.

Sponsored Projects

1. *Title*: Crustal Structure and Electrical LAB beneath Rajmahal Trap and Dalma Volcanics from magnetotelluric Investigations (PI with Prof. Shalivahan, Director, IIPE as CO-PI)
   Agency: Ministry Of Earth Sciences.
   Amount Approved: 89,46,400/-

2. *Title*: Model uncertainty analysis in 3D Magnetotelluric Inversion (**serving as PI**)
   Grant No: Grant No FRS(161)/2021-2022/AGP
   Agency: IIT (ISM) Dhanbad, Dhanbad
   Amount Approved: 8,00,000/-

Field Season Program at Geological Survey of India, Kolkata

1. Reconnaissance survey for Au-Cu-Zn in Kotiya-Kamrora areas, West Singhbhum district, Jharkhand, 2019-20 (FSP ID: *M2APMM-MEP/NC/ER/SU-JH/2019/27029*).
2. Geophysical Mapping in toposheet numbers 74A/3,7,11,12,15 16 covering parts of districts Ganjam, Gajapati district of Odisha Srikakulam district of Andhra Pradesh, 2018-19 (FSP ID: *M1AGS-GPM/NC/ER//2018/16635*).
3. Geophysical Mapping in parts of Purulia, Bankura, West Medinipur districts of West Bengal, East Singhbhum district of Jharkhand and Mayurbhanj district of Odisha (Toposheets 73 J/9,10,11,13,14), 2017-18 (FSP ID*: M1AGS-GPM/NC/ER// 2017/13429*)
4. Input report on exploration for Manganese ore in Boringpadar & Amath block in the Eastern Ghats granulite belt, Kalahandi district, Odisha, 2016-17 (FSP ID: *ME/ER/ODS/2016/014*)