UPENDRA K. SINGH
Professor
Department of Applied Geophysics
Indian Institute of Technology (ISM), Dhanbad-826 004, India

- ***PhD Title:***

  Modelling and inversion of DC resistivity data using Artificial Neural Network

- ***Area of Research:***

  Geophysical exploration methods (gravity, magnetic, electrical and Electromagnetic) and Global Optimization

Present Position:

- *Professor, Indian Institute of Technology (Indian School of Mines), Dhanbad (Jharkhand), India since August 17, 2023.*

Position held:

- *Junior Research Fellow during Nov 16, 1998 to May 4, 2001,*
- *Senior Research Fellow (CSIR Fellowship, Delhi) during May 5, 2001 to April 7, 2003,*
- *Scientist 'B' during April 10, 2003 to November 12, 2007 in National Centre For Antarctic & Ocean Research, Vasco-DaGama, Goa (under Ministry of earth Sciences).*
- *Senior Lecturer since December 5, 2007 to April 12, 2008 in the Department of Applied Geophysics, Kurukshetra University Kurukshetra (Haryana).*
- *Assistant Professor since April 17, 2008 to April 17, 2011 in Department of Applied Geophysics, IIT(ISM), Dhanbad (Jhakhand).*
- *Associate Professor since April 17, 2011 to August 17, 2023 in Department of Applied Geophysics, IIT(ISM), Dhanbad (Jhakhand).*

Awarded:

- 24th Indian Antarctic Expedition during 2004-2005 for summer period, and
- Research paper selected for Van Weelden Award, Geophysical Prospecting, EAGE (USA).

Membership:

- Member, European Association of Geophysicist (EAGE), USA
- Member, Society of Exploration Geophysics (SEG), USA Member,
- American Geophysical Union (AGU), USA 3 Member,
- Indian Geophysical Union (IGU), Hyderabad

Details of Research Work

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1) M. Sc (Tech): Specialization in Exploration Geophysics and experience in geoelectrical resistivity sounding about 50 km2 in the sedimentary rock around Varanasi area as part of my M. Sc (Tech) dissertation. Experience also in the processing and interpretation of Electrical Resistivity Sounding, Magnetic and Electromagnetic data.
2) Ph.D. Topic: The main objectives are to develop and apply Neural Networks based on algorithm for analysis and interpretation of DC Resistivity data. The main computations are (i) Signal 4 detection and identification, (ii) Trend analysis, (iv) Optimization and (iii) Prediction
3) I was working as a JRF since November 16, 1998 to May 4, 2001, as a Senior Research Fellow (CSIR, Delhi) since May 5, 2001 to April 7, 2003 in Deep Resistivity Sounding (DRS) group of NGRI, Hyderabad. I have been deeply involved in the acquisition, processing and interpretation of mentioned following projects, which is given below.
   (i) Deep Resistivity Sounding studies along N-S geo-transect profile along Kupam to Palani in South India sponsored by DST, Delhi.

(ii) Integrated Geophysical studies (Magnetic, Electromagnetic, Resistivity Profiling and Sounding for delineation of Ground water potential in Kudankulam, Tamilnadu sponsored by NPC, BARC, Mumbai.

(iii) Deep Resistivity Sounding studies for Oil exploration in Kutch region sponsored by ONGC.

(iv) Integrated Geophysical studies for the delineation of weak zones in Jaisalmer, western of Rajsthan sponsored by BARC, Mumbai.

(v) Deep Resistivity Sounding studies for Oil exploration in Central India sponsored by OIDB.

4) I have been associated as a scientist 'B' on Commission of Legal Continental project, NCAOR, Goa since April 10, 2004 to till date for the delineating the Legal Continental Shelf of the Indian Ocean using Integrated Marine Geophysical (Seismic, Gravity, magnetic and bathymetry) data and I have been involved in the acquisition, processing and interpretation of above Geophysical marine data. 5 Also I have taken responsibility of another project title "Geophysical studies using Magnetotellurics (MT) method to map the Electrical conductivity structure over and around Schirmacher Oasis, East Antarctica", which has been launched first time from India during 24th INDIAN EXPEDITION TO ANTARCTIC. During NCAOR, Goa I have worked on following projects: (i) Geophysical studies using Magnetotellurics (MT) method to map the Electrical conductivity structure in and around Schirmacher Oasis, East Antarctica sponsored by NCAOR, Goa (Department of Ocean Development, Delhi). (ii) Crustal Structure Comparison between Eastern Continental Margin of India and Eastern Antarctic Margin through Gravity Modeling.

5) Since December 5, 2007 I had joined as Senior Lecturer in Kurukshetra University Kurukshetra, where I tough Finite element/difference method and marine Geophysics.

6) Recently I have joined as Assistant Professor in Indian School of Mines on April 17, 2008 in Department of Applied Geophysics, Dhanbad (Jhakhand), India. The scientific aims and objectives of above project are given below: Legal Continental Shelf program on Bay of Bengal, Andman-Nicobar and Arabian Ocean sponsored by Department of Ocean Development, Delhi.

Technical Reports

(i) Deep Resistivity Sounding studies along N-S geo-transect (Kupam to Palani) profile in South India to detect shear zones submitted to DST, Delhi. Technical Report No. NGRI-2001-EXP317.

(ii) Integrated Geophysical studies for delineation of Ground water potential in Kudankulam, Tamilnadu submitted to BARC, Mumbai. Technical Report No. NGRI-2000-Litho-274.

(iii) Deep resistivity sounding studies for oil exploration in Kutch region submitted to ONGC. Technical Report No. NGRI-2000- EXP-296.

(iv) Integrated Geophysical studies for the delineation of weak zones in Jaisalmer, western of Rajasthan sponsored by BARC, Mumbai. Technical Report No. NGRI-2001-EXP-310.

(v) Integrated Geophysical studies for Oil exploration in Central India submitted to Oil Industrial Development Board (OIDB). (vi) Preliminary analysis of seismic reflection data of the western margin of India acquired under the CLCS Project, NCAOR, Vasco, Goa.

(vi) Mapping the electrical conductivity structure using magnetotelluric method in and around the Schirmacher oasis, east Antarctica submitted to NCAOR, Goa.

Experience in acquisition, processing and analysis of Seismic, Gravity, Magnetic, Resistivity and Bathymetry data

(i) Since 1998, I have been involved for the exploration Hydrocarbon in National Geophysical Research Institute, Hyderabad that has been given above in detail. 7 (ii) Presently since April 2003, I have involved in marine data acquisition, processing and analysis for the delineation of legal continental shelf behalf of the Indian Government. During this period, 32,000 line km marine geophysical data including seismic, gravity, magnetic and bathymetry around the East Coast, Andman-Nicobar and West Coast was acquired.

Association

- Member, European Association of Geophysicist (EAGE), USA
- Active Member, IEEE
- Member, Society of Exploration Geophysics (SEG), USA
- Member, American Geophysical Union (AGU), USA
- Member, Indian Geophysical Union (IGU), Hyderabad
- Member, XXIV Antarctic Expedition

Thesis Supervision: **PhD Completed**

(i) Arvind Singh (2016), Modelling and inversion of gravity and magnetic data potential field data using wavelet transform.

(ii) Sowrav Saikia (2017), The lithospheric structure of the Himalayan Belt and its adjoining region from Receiver Function analysis, Dr. Sumer Chopra (Co-Guide).

(iii) Ravi Roshan (2018), Modelling and inversion of gravity anomalies using particle swarm optimization and its variants.

(iv) *Raj Kumar (2018), Depth estimation of anomalous sources from magnetic data for scaling geology, Dr. A. R. Bansal (Co-guide).*

(v) *Mukaila Abdullahi (2019), Crustal architecture beneath the Benue trough Of Nigeria Peninsula derived from 2D/3D inversion of gravity and magnetic data.*

(vi) *Rahul Prajapati (2021), Wavelet transform and multifractal analysis for detection of hydro-fracture and gas hydrate zone using well log data.*

(vii) *Kuldeep Sarkar (2023), 2D/3D inversion of 2D electrical resistivity data over coalfield area using global PSO variants optimization.*

(viii) *Mukesh (2023), Modelling and Inversion of seismic and microgravity data using Hybrid PSO with GSA global optimization.*

Thesis Supervision: ***PhD Ongoing***

(i) *Jit Varish Tiwari (2017), Joint Inversion of Seismic Refraction and Geoelectrical Resistivity data using Global Optimization Method.*

(ii) *Nitesh Kumar Umrao (2019), Joint Inversion of Gravity and Magnetotelluric data using PSOGSA metaheuristic algorithms and Statistical approach.*

(iii) *Abhishek Kumar (2021), Inversion of integrated geophysical data based on deep learning for soil liquefaction potential assessment.*

(iv) *Angad Yadav (2022), Joint Inversion of Magnetotelluric and Receiver Function geophysical data using global optimization.*

(v) *Shubham Kumar (2023), Joint inversion of gravity, magnetic and MT data using global optimization.*

(vi) *Mukesh (2023), Joint inversion of GPR and ERT data based on global optimization.*

(vii) *Ankita Devi (2023), Machine Learning of Seismic and GPR data.*

M. Tech Supervision: (A) Completed

(i) Akhil M. S. (2017), Interpretation of gravity anomaly over eastern Dharwar craton, India using 3-D Euler deconvolution and spectral analysis.

(ii) Anubhav Shukla (2017), Interpretation of gravity and magnetic anomalies over Vindhyan basin, India using 3-D Euler deconvolution and spectral analysis.

(iii) Haradas Mahanta (2018), Interpretation of residual gravity and magnetic anomaly over Cambay basin, India using 3-D Euler deconvolution and spectral analysis.

(iv) Chandan Kumar Singh (2018), 2D/3D inversion of gravity anomalies for reconstruction of Mahanadi graven, East continental margin of India and Lambert graben, East continental margin of Antarctica.

(v) Kumar Anand (2018), Modelling and Inversion of geoelectrical resistivity sounding data for ground water probable zone.

Sponsored Projects

(i) Mapping the electrical conductivity structure using magnetotelluric method in and around the Schirmacher oasis, east Antarctica submitted to NCAOR, Goa.

(ii) Wavelet-ANFIS conjunction method for well logging data analysis, funded by IIT(ISM) Dhanbad, India. Project cost of Rs. 6.85 lakhs.

(iii) Study of Continental Margin of East Antarctica craton vis-à-vis Eastern Continental Margin of India using Inversion and Modelling of Satellite Gravity data, sponsored by DST, Govt of India. Project cost of Rs. 3.22 lakhs.

(iv) *An Integrated Geophysical Approach for Tectonic study in Moher Main Coal basin of Singrauli Coal field using 3D Inverse modeling of Gravity and Magnetic, and AMT data, sponsored by Coal of India (CIL), Govt. of India, Project cost of Rs. 351.00 lakhs.*

(v) *Joint Inversion of Gravity and Magnetotelluric Data with variable Density and Conductivity for Enhancement of Subsurface Imaging of the Sedimentary Environments Using Global Optimization Technique, Start Date-31 December 2020, CRG/2020/006264 dated 31.12.2020, Rs. 2939720.00*

(vi) *Identification of suitable sites and designing of environmental friendly rainwater harvesting structures for catching the rain where it falls when it falls in the IIT(ISM) campus area, IIT(ISM)/2021-2022/803/INSTITUTE, 8,80,000.00 start date- 01 June 2021, DRD-11014/43/2021-ES dated 11.06.2021, IIT(ISM) Dhanbad.*

(vii) *Preparation of Catchment Treatment Plan, VEDANTA (ESL)/2020-2021/726/ESE, Rs. 35,40,000.00, **Sanction Number-** 4900000153 dated 04.09.2020, VEDANTA LIMITED.*

(viii) *SERB-Centre of Excellence to develop Deep learning models for early warning of extreme Geohazards, Ref. No. 292021000459, Scheme-Intensification of Research in High Priority Areas (IRHPA), Area-Deep learning models for early warning of extreme Geohazards, Proposed fund- RS. 27,89,36,560.00 (Submitted)*

Consultancy Projects

(i) *Pal, S. K., Singh, Upendra K., 2020, Cavity detection study for Rail infrastructure around Maithon Power Plant using Integrated Electrical Resistivity Tomography. Funded by M/s Larsen & Toubro Limited RC Maithan, Total cost: Rs. 11,80,000.00, completed.*

(ii) Singh, Upendra K., Pal, S. K., 2020, Electrical resistivity tomography (ERT) and Seismic Refraction Tomography (SRT) for Subsurface characterizaton to delineate possible voids/ unstable zones in and around Howrah-Delhi main rail line near Mugma. Total cost: Approx Rs. 28,80,000, CONS/6041/2020-2021, 2020-2021, ECL, Mugma Area submitted.

(iii) ERT study for ground water near Topchanchi, Dhanbad, 2018-2019, CONS/3975/2018-2019, Forest Department, 86957, submitted

(iv) Pal, S. K., Singh, Upendra K., Shalivahan, and Mohanty, P. R., 2016, Seismic Refraction Tomography study in Trishuli Galchhi Hydroelectric Project in Nepal. Excelling Geo & Engineering (EGE) Consultant Pvt. Ltd (EGECPL) New Delhi and Siddhakali Power Limited, Katmandu, Nepal, CONS/3337/2016-17, Rs. 3,25,000.00.

(v) Pal, S. K., Singh, Upendra K., Shalivahan, and Mohanty, P. R., 2016. Geophysical Study to get the extent and depth of Workings of local seam beneath the Railway acquired land. BCCL, Dhanbad CONS/3174/2016-17, Rs. 6,63,140.00.

(vi) Pal, S. K., Singh, Upendra K., Shalivahan, and Mohanty, P. R., 2016. Electrical Resistivity Tomography for locating of cavity zones around Thapar Nagar. ISM Ref. No.: CONS/3166/2016-17. 2016-2017, Funded by M/s Larsen & Toubro Limited RC Maithan Project, Total cost: Rs. 5,95,634.00.

(vii) Pal, S. K., Singh, Upendra K., Shalivahan, and Mohanty, P. R., 2015. Electrical Resistivity Tomography for ground water investigation near Govindpur road, Dhanbad. ISM Ref. No.: CONS/3104/2015-16. 2015-2016, Funded by M/s Castron Technologies Ltd, Dhanbad, Total cost: Rs. 43,668.00, Completed.

(viii) Pal, S. K., Singh, Upendra K., Shalivahan, and Mohanty, P. R., 2015. Observation on the reports of wreck site of River Princes at Sinquerim-

Candolim Goa. ISM Ref. No.: CONS/3034/2015-16, 2015-2016, Funded by Director of Tourism, Govt. of Goa, Total cost: Rs. 1,75,439.00.

(ix) *Pal, S. K., Singh, Upendra K., Shalivahan, and Mohanty, P. R., 2015, Cavity detection study for Rail infrastructure around Maithon Power Plant using Integrated Electrical Resistivity Tomography. Funded by M/s Larsen & Toubro Limited RC Maithan Project, Total cost: Rs. 26,82,000.00, CONS/2707/2014-15.*

(x) *Singh, Upendra K., Pal, S. K., Shalivahan, and Mohanty, P. R., 2015, Subsurface Cavity/Gallery/Goaf detection around Jogidih colliery, BCCL, Dhanbad. Total cost: Rs. 2,00,000.00, CONS/2610/2014-15.*

(xi) *Pal, S. K., Singh, Upendra K., Shalivahan, and Mohanty, P. R., 2013, Electrical Resistivity Imaging and Self Potential survey for locating of fracture zones and seepage analysis at Talabiria-I Coal mines, Sambalpur, Orissa, Funded by M/s AGE Consulting, New Delhi. Total cost: Rs. 6,30,002.00, CONS/1932/2013-14.*

(xii) *Singh, Upendra K., Pal, S. K., Shalivahan, and Mohanty, P. R., 2012, Geophysical exploration for mapping of Traps of Panchami, Hatgacha and Jathia in Suri of Birbhum District, West Bengal, Funded by West Bengal Mineral Development & Trading Corporation Ltd., Kolkata. Total cost: Rs. 27,52,820.00, CONS/1890/ 2012-13.*

(xiii) *Shalivahan; Venkatesh, A. S.; Singh, Upendra K., Pal, S. K., Singh, S.; Sahoo, P. R., 2013, Geological and Geophysical Surveys in and around the proposed alleged gold treasure sites, Kanpur. Private Firm through Government of India. Total cost: Rs. 7,86,520.00, CONS/1959/13-14.*

(xiv) *Singh, Upendra K., Pal, S. K., Shalivahan, and Mohanty, P. R., 2012, Geophysical survey for mapping Magnetite of deposits at Thana area of Giridih, Jharkhand, Funded by M/s. KARUNA DEVI*

AGARWALA, Giridih-81530, Jharkhand. Total cost: Rs. 2,13,484.00, CONS/1892/2012-2013.

Publications in International/National Journals

(i) Kuldeep Sarkar, and Upendra K. Singh, S. B. Singh (2023), Joint Inversion of HLEM and VES data via A Nature- Inspired Stochastic Hybrid Technique to decipher Saline water intrusion zone, Water Resources (Under review).

(ii) Kuldeep Sarkar, Arun Singh and Upendra K. Singh (2023), 2D Magnetotelluric data inversion using the Fusion of Particle Swarm and Grey Wolf Optimization, Geophysical Journal International (Under revision).

(iii) Kuldeep Sarkar and Upendra K. Singh Uncertainty, sensitivity and resolution assessment using vPSOGWO Joint inversion of MT and DC data, GEOPHYSICS (Under revision).

(iv) Abhishek Kumar, Upendra K. Singh and, Biswajeet Pradhan (2024), Enhancing subsurface contamination assessment via ensemble prediction of ground electrical property: A Colorado AMD-impacted wetland case study, Journal of Environmental Management, Volume 351, February 2024, 119943, https://doi.org/10.1016/j.jenvman.2023.119943. IF 8.7 (Q1).

(v) Rahul Prajapati, Raj Kumar and Upendra K. Singh (2023), Assessment of Reservoir Heterogeneities and Hydrocarbon Potential Zones Using Wavelet-Based Fractal and Multifractal Analysis of Geophysical Logs of Cambay Basin, India, Marine and Petroleum Geology, Volume 160, February 2024, 106633, http://dx.doi.org/10.2139/ssrn.4448588. IF 4.2 (Q1).

(vi) Mukaila Abdullahi, Raj Kumar, Bello Yusuf Idi, Upendra Kumar Singh & Adamu Usman Abba (2023), Analysis of recent airborne gravity and magnetic data for the interpretation of basement structures underneath the south-western Benue trough using source edge detector filters, Acta Geophysica volume 71, 1595-1606, https://doi.org/10.1007/s11600-023-01060-1. IF 2.3 (Q2).

(vii) Mukesh, Kuldeep Sarkar, and Upendra K. Singh (2023), The joint application of metaheuristic algorithm and Bayesian Statistics approach for uncertainty and stability assessment of nonlinear Magnetotelluric data, Nonlin. Processes Geophys., 30, 435-456, 2023 https://doi.org/10.5194/npg-30-435-2023. IF 3.534 (Q2).

(viii) Kuldeep Sarkar, Mukesh and Upendra K. Singh (2023), Nature inspired stochastic hybrid technique for Joint and Individual inversion of DC and MT data, Scientific Reports, February 2023Scientific Reports 13(2668 (2023)) https://doi.org /10.1038/s41598-023-29040-x, IF 4.997 (Q1).

(ix) Kuldeep Sarkar, Upendra K. Singh (2023). Inversion, Assessment of Stability and Uncertainty of Geoelectric Sounding data using a New Hybrid Meta-heuristic algorithm and Posterior Probability Density Function Approach, Nonlin. Processes Geophys., https://doi.org/10.5194/npg-2022-13. IF 3.534 (Q2).

(x) Abhishek Kumar, Upendra Kumar Singh, and Biswajeet Pradhan, Ground Penetrating Radar in Coastal Hazard Mitigation Studies Using Deep Convolutional Neural Networks, Remote Sens. 2022, 14, 4899. https://doi.org/10.3390/rs14194899. IF 5.349 (Q1).

(xi) Sowrav Saikia, Sumer Chopra, Bibhuti Gogoi, Antara Sharma, J.L. Gautam, Himanta Borgohain, Upendra K. Singh, 2022. Variation in Moho topography and Poisson's ratio 1 in the Eastern Himalayan arc,

Physics and Chemistry of the Earth. https://doi.org/10.1016/j.pce.2022.103134. IF 2.712 (Q1).

(xii) *Rahul Prajapati, Upendra K. Singh (2020), Delineation of stratigraphic pattern using combined application of wavelet-Fourier transform and fractal dimension: A case study over Cambay Basin, India, Marine and Petroleum Geology, 120, 2020, 104562, https://doi.org/10.1016/j.marpetgeo.2020.104562. IF 4.348 (Q1).*

(xiii) *Sowrav Saikia, Santanu Baruah, Sumer Chopra, Bibhuti Gogoi, Upendra K. Singh, Bubul Bharali (2019). An appraisal of crustal structure of the Indo-Burmese subduction region, Journal of Geodynamics, https://doi.org/10.1016/j.jog.2019.05.002. IF 2.345 (Q1).*

(xiv) *Mukaila Abdullahi, Raj Kumar and Upendra K. Singh (2018). Magnetic basement depth from high-resolution aeromagnetic data of parts of lower and middle Benue Trough, Nigeria using scaling spectral method, Journal of African Earth Sciences, Elsevier (150 (2019) xxx-xxx, https://doi.org/10.1016/j.jafrearsci.2018.11.006. IF 2.046 (Q2).*

(xv) *Mukaila Abdullahi, Upendra K. Singh and Ravi Roshan (2018). Mapping magnetic lineaments and subsurface basement beneath parts of Lower Benue Trough (LBT), Nigeria: Insights from integrating gravity, magnetic and geologic data, Journal of Earth System Science, doi.org/10.1007/s12040-018-1038-9. IF 1.371 (Q2).*

(xvi) *Mukaila Abdullahi and Upendra K. Singh (2018). Sedimentary Thickness and Basement Structures beneath parts of Lower Benue Trough (LBT), Nigeria: Insights from Recent Geology and Gravity data, Arabian Journal of Geosciences, Springer, (2018) 11:694, https://doi.org/10.1007/s12517-018-4065-6. IF 1.827 (Q3).*

(xvii) *Upendra K. Singh, Rahul Prajapati and Thinesh Kumar (2017). Geological Stratigraphy and Spatial Distribution of Microfractures*

over Costa Rica Convergent Margin, Central America- A Wavelet-Fractal Analysis, Geoscientific Instrumentation Methods and Data Systems, 7, 1–9, 2018. doi.org/10.5194/gi-7-1-2018. IF 1.473 (Q3).

(xviii) Sowrav Saikia, Santanu Baruah, Sumer Chopra, Upendra K. Singh, Bibhuti Gogoi and Himanata B. Gohain, 2017. Study of crustal structure and geological implications of southwestern margin of Northeast India, Journal of Seismology, DOI 10.1007/s10950-017-9701-1, 1–21, October, 2017. IF 1.489 (Q2).

(xix) Raj Kumar, Abhey Ram Bansal, S. P. Anand, Vijay K. Rao, Upendra K Singh, 2017. Mapping of magnetic basement in the Central India from Aeromagnetic data for scaling geology, Geophysical Prospecting, 2017, doi:10.1111/1365-2478.12541. IF 1.742 (Q2).

(xx) Arvind Singh and Upendra Kumar Singh, (2017). Continuous wavelet transforms and Euler deconvolution method and their application to magnetic field data of Jharia coalfield, India, Geoscientific Instrumentation Methods and Data Systems, 6, 53–69, doi:10.5194/gi-6-53-2017. IF 1.473 (Q3).

(xxi) Ravi Roshan and Upendra Kumar Singh (2017). Inversion of residual gravity anomalies using tuned PSO, Geoscientific Instrumentation Methods and Data Systems, 6, 71–79, doi:10.5194/gi-6-71-2017. IF 1.473 (Q3).

(xxii) Kunal Kishore Singh and Upendra Kumar Singh (2017). Application of particle swarm optimization for gravity inversion of 2.5-D sedimentary basins using variable density contrast, Geoscientific Instrumentation Methods and Data Systems, 6, 193–198, 2017, doi:10.5194/gi-6-193-2017. IF 1.473 (Q3).

(xxiii) Sowrav Saikia, Sumer Chopra, Santanu Baruah, P. R. Baidya, Upendra K. Singh (2016). Crustal imaging of the Northwest

Himalaya and its foredeep region from teleseismic events, Geomatics, Geomatics Natural Hazards & Risk, 7, 4, 1265-1286. IF 3.528 (Q1).

(xxiv) Sowrav Saikia, Sumer Chopra, Santanu Baruah, Upendra K. Singh (2016). Shallow Sedimentary Structure of the Brahmaputra Valley Constraint from Receiver Functions Analysis, Pure and Applied Geophysics, 1-19, doi: 10.1007/s00024-016-1371-3. IF 2.335 (Q2).

(xxv) Arvind. Singh and Upendra K. Singh (2015). Wavelet analysis of Residual Gravity Anomaly profiles: Modeling of Jharia Coal Basin, India, Journal of The Geological Society of India, 86, 2015, 679-686. IF 1.459 (Q2).

(xxvi) D.N. Murthy, K. Veeraswamy, T. Harinarayana, Upendra K. Singh & M. Santosh (2013). Electrical structure beneath Schirmacher Oasis, East Antarctica: a magnetotelluric study, Polar Research, 32, 17309. IF 1.612 (Q2).

(xxvii) Upendra K. Singh, R. K. Tiwari and S. B. Singh (2013). Neural Network Modeling and Prediction of Resistivity Structures using VES data over a Geothermal Area, Computers & Geosciences, 52, 246-257, 10.1016/j.cageo.2012.09.018, IF 3.62 (Q1).

(xxviii) K. K. K. Singh, Upendra K. Singh, Indresh Kumar, (2013). Interpretation of voids or buried pipes using Ground Penetrating Radar modeling, Journal of The Geological Society of India, 81, 397-404. IF 0.899 (Q2).

(xxix) Upendra K. Singh (2011). Fuzzy Inference System for identification of lithologs off Prydz Bay, East Antarctica, Journal of Applied Geophysics, 75, 687-698, DOI: 10.1016/j.jappgeo.2011.08.001, IF 1.975 (Q2).

(xxx) Upendra K. Singh, D.K. Singh and H. Singh (2010). Application of Neurofuzzy Pattern Recognition Method in Borehole Geophysics,

Acta Geodaetica et Geophysica Hungarica, December, Vol 45, No. 4, *IF 0.909 (Q4).*

(xxxi) U. K. Singh, R. K. Tiwari and S. B. Singh (2010). Inversion of 2-Dimensional DC Resistivity Data using Rapid Optimization and Minimal Complexity Neural Network, *Nonlinear Processes in Geophysics* (AGU), 17, 65-76. *IF 1.740 (Q2).*

(xxxii) U. K. Singh, S. Rajan, D. K. Pandey (2008). Crustal Structure and Continent Ocean Boundary of Prydz Bay, East Antarctica based on Gravity Modeling, *Indian Journal of Geo-Marine Sciences*, 37 (4) 419-423, *0.496 (Q4).*

(xxxiii) U. K. Singh, R. K. Tiwari, S. B. Singh (2006). Prediction of Electrical Resistivity Structures using Artificial Neural Networks, *Journal of The Geological Society of India* 67, 234-242. *IF 1.459 (Q2).*

(xxxiv) U. K. Singh, R. K. Tiwari, S. B. Singh (2005). One-dimensional inversion of geo-electrical resistivity sounding data using artificial neural networks-a case study, *Computers & Geosciences*, 31, 99-108. *IF 3.62 (Q1).*

(xxxv) U. K. Singh, G. K. Hodlur, R. K. Das (2004). Significance of Dar-Zarrouk parameters in the exploration of quality affected coastal aquifer system, *Environmental Earth Sciences* (Springer) 45, No. 5, 696-702. *IF 1.127 (Q3).*

(xxxvi) G. K. Hodlur, U. K. Singh, R. K. Das, R. Rangrajan, Ramesh Chand, S. B. Singh (2003). Geophysical Expression of Natural Recharge in two different geological terrains, *Groundwater* (Blackwell) 41, No. 6, 857-866. *IF 2.671 (Q2).*

(xxxvii) S. B. Singh, U. K. Singh, Jimmy Stephen, Y. Srinivas, K.P. Singh (2002). Integrated geophysical approaches for Groundwater prospecting: A case study. *Journal of Geological Society of India*, 59, 147-158. *IF 1.459 (Q2).*

(xxxviii) S. B. Singh, Jimmy Stephen, U. K. Singh, Y. Srinivas, K. P. Singh (2003). Electrical signature in high-grade metamorphic terrain of South India using deep resistivity sounding studies. *Memoir of Geological Society of India*, 50, 125-138. *IF 1.459 (Q2).*

Publications in International/National Proceedings

(i) Kumar, A., Sarkar, K., Mukesh and Singh, Upendra K., 16-21 August 2021.Estimation of Seismic Parameters using Time Varying Inertia Weight-Particle Swarm Optimization, 36th International Geological Congress, Delhi, India.

(ii) Singh, Upendra K., Sarkar, K. and Tiwari, J.V., 16-21 August 2021.Two-Dimensional inversion and resolution Analysis of DC Resistivity data - A innovative Global Optimization Approach, 36th International Geological Congress, Delhi, India.

(iii) Mukesh, Sarkar, K. and Singh, Upendra K., 18-21 October, 2021. Joint Inversion of MT and DC Resistivity using Meta-Heuristic Algorithm with Gibb's Sampler, EAGE Annual 2021, Amsterdam, Netherland.

(iv) Sarkar, K., Mukesh and Singh, Upendra K., 13-17 December 2021. Assessment of Probabilistic Boltzmann distribution in Joint Hybrid Global Inversion for 1D MT and DC data. AGU Fall Meeting 2021.

(v) Mukesh, Sarkar, K. and Singh, Upendra K., 13-17 December 2021. Joint approach of particle swarm optimization and Gibb's sampler for improving non-linear solution. AGU Fall Meeting 2021.

(vi) Sarkar, K. and Singh, Upendra K., 20-22 February 2020. Sensitivity and Uncertainty analysis of 1D Geophysical Data: a new meta-heuristic Cauchy-GWO global optimization Approach, International Conference on Engineering Science & Technologies for Environmental Care, Assam, India.

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