

UPENDRA KUMAR SINGH
Assistant Professor
Indian School of Mines, Dhanbad, India



Born: August 05, 1972

Education:

- ✚ High School, Bihar Board, Patna, India,
- ✚ I. Sc, Govt. Queens College, Varanasi, UP Board, India,
- ✚ B. Sc in 1994 and M. Sc (Tech), First Division in 1997, Banaras Hindu University, Varanasi, India,
- ✚ PhD Thesis title “Modelling and inversion of DC resistivity data using Artificial Neural Network” awarded from Osmania University, Hyderabad, India in 2006.

Present Positions:

- ✚ Assistant professor, Department of Applied Geophysics, Indian School of Mines, Dhanbad (Jharkhand), India since April 17, 2008

Awarded:

- ✚ Project Fellow ‘B’ (NGRI Fellowship) during Nov 16, 1998 to May 4, 2001,
- ✚ Senior Research Fellow (CSIR Fellowship, Delhi) during May 4, 2001 to April 10, 2005,
- ✚ Member of 24th Indian Antarctic Expedition during 2004-2005 for summer period,
- ✚ Research paper selected for Van Weelden Award, Geophysical Prospecting, EAGE (USA).

Membership: Member JGSI, Banglore; Society of Exploration Geophysics (SEG), USA; EAGE, USA; Indian Statistical Union (Kolcutta); Indian Geophysical Union, Hyderabad, India.

Research Areas:

Exploration Geophysics, Artificial Neural Network and Fuzzy logic

Address:

Department of Applied Geophysics
Indian School of Mines
Dhanbad, Jharkhand, India

Phone: +91-326-2235606 (O)

: +91-326-2224768 (R)

: +91-9931810884 (Mobile);

E-mail: upendra_bhui1@rediffmail.com or upendrakrish@gmail.com

CAREER OBJECTIVE: To work for an environment where my knowledge can be explored, where I can dedicate all my sincere efforts for the well being of the organization.

Details of Research Work

- 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 detection and identification, (ii) Trend analysis, (iv) Optimization and (iii) Prediction
- 3) I was working as a project fellow 'B' 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 processing and interpretation of mentioned following projects, which is given below.
- 4) I had 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. 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. Present I am working on satellite gravity, magnetic and bathymetry data to compare the crustal structure of Continental margin of India and east Antarctica.
- 5) Since December 5, 2007 I had joined as Senior Lecturer in Department of Applied Geophysics, Kurukshetra University Kurukshetra (Haryana).

- 6) Recently I have joined as Assistant Professor in Indian School of Mines on April 17, 2008 in Department of Applied Geophysics, Dhanbad (Jharkhand), India.
- 7) The scientific aims and objectives of above project are 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 OIBD.
 - (vi) Legal Continental Shelf program on Bay of Bengal, Andman-Nicobar and Arabian Ocean sponsored by Department of Ocean Development, Delhi.
 - (vii) 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).
 - (viii) Crustal Structure Comparison between Eastern Continental Margin of India and Eastern Antarctic Margin through Gravity Modeling.

Experience in Seismic, Gravity and Bathymetry data Analysis

- (i) Since 1998, I have been involved for the exploration Hydrocarbon in National Geophysical Research Institute, Hyderabad that has been given above in detail.
- (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.

Technical Qualification

1. Proficient in 3D/2D workstation interpretation

- ✚ Knowledge of Landmark such as 2-D Promax, Geographic, Geosoft 4.9.4, GM-SYS
- ✚ Skilled in seismic surface interpretation- since 2003
- ✚ Skilled in seismic surface mapping- since 2003
- ✚ Skilled in seismic data enhancement-since 2003
- ✚ Understanding of and ability to exercise basic seismic processing applications-since 2003

2. Strong prospect generation skills

- ✚ Ability to integrate subsurface (well) information into interpretations with use of cross-sections, maps, 3D/2D seismic displays
- ✚ 3D visualization techniques
- ✚ Velocity Modeling
- ✚ Time/Depth Conversion expertise

3. I have also skilled in following software using various geophysical fields:

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|-------|---|---|
| (i) | Seismic data processing software | : 2-D Promax |
| (ii) | Gravity & Magnetic data processing software | : Geosoft 4.9.4 |
| (iii) | Gravity & Magnetic data modeling software | : GM-SYS |
| (iv) | Graphic softwares | :Geographic,
Matlab 7.1, GMT, Surfer 8.0, Grapher 4.0 and ArcGIS 9.1 |
| (v) | Operating System | : MS-Window |
| (vi) | Computer basics | : MS Office |

Interests and Hobbies

- Upgrading my knowledge,
- Reading Science Journals and Magazines,
- Listening music and songs,
- Football and Volleyball.

Strengths

- Solid time management and multi tasking abilities,
- Good grasping power,
- Commitment, Optimistic, Dedicated, and
- Good team sprit and willing to work in shifts.

Completed/Ongoing project

- (i) Geophysical studies using Magnetotellurics (MT) method to map the Electrical conductivity structure in and around Schirmacher Oasis, East Antarctica sponsored by NCAOR, Goa (Ministry of Earth Science, Delhi) completed.
- (ii) Crustal Structure Comparison between Eastern Continental Margin of India and Eastern Continental Margin of Antarctica through Gravity Modeling submitted to DST, Delhi.
- (iii) Development of the Advance Hybrid Technique of Artificial Neural Network and Fuzzy logic, and its Application to Geophysical data under submission to ISM Dhanbad.

Publications in International/National Journals

- (i) U. K. Singh, S. Rajan, D. K. Pandey (2008). Crustal Structure and Continent Ocean Boundary of Prydz Bay, East Antarctica based on Gravity Modeling, [IJMS](#), 37(4) 419-423.
- (ii) 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.
- (iii) U. K. Singh, R. K. Tiwari, S. B. Singh (2006). Prediction of Electrical Resistivity Structures using Artificial Neural Networks, [Journal of Geological Society of India](#) 67, 234-242.
- (iv) U. K. Singh (2004). Significance of Dar-Zarrouk parameters in the exploration of quality affected coastal aquifer system, [Environmental Geology \(Springer\)](#) 45, No. 5, 696-702.
- (v) U. K. Singh, G. K. Hodlur, R. K. Das, R. Rangrajan, Ramesh Chand, S. B. Singh (2003). Geophysical Expression of Natural Recharge in

two different geological terrains, [Ground Water](#) (Blackwell) 41, No. 6, 857-866.

- (vi) [U. K. Singh](#), R. K. Tiwari, V. K. Somvanshi, S. B. Singh (2002). Inversion of DC Resistivity Data using Artificial Neural Network approach-A case study. [IGC-2002](#), 57-64.
- (vii) G. S. Yadav, [U. K. Singh](#) (2000). Geoelectrical Resistivity Sounding for locating potential aquifers around Shivshankari Dham, Mirzapur. [Ground water resources-98](#), BHU, Varanasi, 85-92.
- (viii) S. B. Singh, Ashok Babu, [U. K. Singh](#), Jimmy Stephen Y. Srinivas (2000). Deep Resistivity Sounding studies along N-S geo-transect to detect the conductive shear zones in the Southern Granulitic terrain. [The Indian Mineralogist](#) 34, No. 1, 48-51.
- (ix) 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.
- (x) 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.
- (xi) [U. K. Singh](#), R. K. Tiwari (2002). Modeling and prediction of precipitation over the Indian continent using Artificial Neural network. [IGC-2002](#), 477-483.

[Accepted Book for Publication](#)

- (i) [U. K. Singh](#) (2009). Artificial Neural Network Inversion and Modeling in Exploration Geophysics, [German Publishing House Ltd.](#)

[Under Revision/Review](#)

- (i) U. K. Singh, D.K. Singh (2009). Application of Neurofuzzy Pattern Recognition Method in Borehole Geophysics, [Current Science](#).
- (ii) U. K. Singh, R. K. Tiwari and S. B. Singh (2009). Inversion of 2-Dimensional DC Resistivity Data using Rapid Optimization and Minimal Complexity Neural Network, [Non-linear Processes in Geophysics \(AGU\)](#).

- (iii) U. K. Singh and R. K. Tiwari (2009). Neural Network Modeling and Prediction of Resistivity Structures using VES data over a Geothermal Area, [Computational Geosciences \(Springer\)](#).
- (iv) U. K. Singh, P. R. Moulik (2007). Fuzzy Inference System for identification of lithologs off Prydz Bay, East Antarctica, [Geophysical prospecting \(EAGE\)](#).

Under communication

- (i) U. K. Singh (2007). Nonlinear noise cancellation of Shipborne Gravity and Bathymetry data using Hybrid ANFIS. (under preparation for [Computer & Geosciences](#))
- (ii) U. K. Singh (2007). Hybrid of Fuzzy Logic and Neural Network interpretation of ODP Leg 170 data confirms complete sediment subduction at the Costa Rica convergent margin (under preparation for [Earth & Planetary Science Letter](#)).
- (iii) U. K. Singh (2007). Continent Ocean Boundary of the East India and East Antarctica based on Gravity and Bathymetry modelling, (under preparation in [Marine Geophysical Researches](#)).

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-EXP-317.
- (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.

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