Dr. Jitender Kumar, PhD in Geophysics
Scientist-B
Wadia Institute of Himalayan Geology (WIHG), Dehradun, India
Seismic Interpretation Laboratory-WIHG, Dehradun
Email: jitender@wihg.res.in; jitender.tanwar721@gmail.com
GS: https://scholar.google.com/citations?user=EluwpqkAAAAJ&hl=en
RG: https://www.researchgate.net/profile/Jitender_Kumar42
Office: (0135)2525468; Mobile: +91-7095811128

Research Statement

My doctoral works include the structural and stratigraphic interpretation based on rock physics and basin modeling. I have built requisite experience in interpretation of marine seismic and petrophysical well log data for delineation and assessment (using rock physics) of gas hydrates.
Furthermore, I have been actively involved from last two years in Activity-2A of Geophysics Group of Wadia Institute of Himalayan geology, Dehradun. Here, I have built requisite experience in Machine learning and Deep learning application for subsurface interpretation using seismic and petrophysical data. Additionally, I have also used machine learning practices for automatic prediction of missing petrophysical logs form other available logs.

Research Interests

My major research interest includes the following:

- Machine Learning and Artificial Intelligence for interpretation of Geoscientific data.
- Subsurface structural and stratigraphic interpretation
- Quantitative basin analysis
- Reservoir Characterization
- Petrophysical property estimation

Education

Sr. No.	Degree/Certificate	Academic Year	University/Institute	Subjects
1.	B.Sc.	2011	Kurukshetra University	Physics, Chemistry, Math
2.	M.Tech.	2014	Kurukshetra University	Applied Geophysics
3.	PhD	2020	Andhra University/CSIR-NGRI	Geophysics

Professional Experience

07/2023 – present: Scientist- “B”
09/2021-07/2023: Research Associate, WIHG Dehradun
10/2014-02/2020: Project Assistant, CSIR-NGRI, Hyderabad
01/2014-06/2014: Industrial Trainee, PARSAN Overseas Pvt. Limited, New Delhi (India)

Awards and Fellowships/ Presentation

Years	Achievements and awards
2012	Awarded with best poster, 2012 by Indian Geophysical Union (IGU).
2013	Participated in 50th IGU posters competition
2013	Presented a poster in the Anveshan (Student Research Convention)
2015	Participated in 52th IGU poster competition
2015	Presented an oral presentation at11th Biennial international conference of SPG, India.
2016	Awarded with best poster, 2016 by Indian Geophysical Union (IGU).
2017	Delivered an oral presentation at annual convention of Society of exploration Geophysicist, Houston, USA
2017	CSIR Foreign Travel Grant, CSIR
2019	Presented a poster in the 3rd NGRSM, Dehradun, India
2021	Presented a Poster in AEG, 2021
2022	Delivered a Young Research Talk in FIGA, 2022
2022	Presented a Poster in FIGA, 2022

National and International Collaborations

National Collaborators

- Dr. Kalachand Sain (Director, WIHG, Dehradun)
- Dr. P.C. Kumar, Scientist, WIHG, Dehradun
- Dr. Bappa Mukherjee, Scientist, WIHG, Dehradun

Work Experience/Responsibilities

Dates	Place	Responsibility/Role
07-09-2021- 06-07-2023	Post-doctoral Research Associate (WIHG, Dehradun)	Structural modeling, facies analysis, sequence stratigraphy, reservoir property estimation through Machine learning approach using 3D seismic data
20/10/2014 to 21-10/2020	Project Assistant/ Doctoral Research Fellow (CSIR-NGRI, Hyderabad, India)	Seismic data processing and Interpretation, Delineation and assessment of gas hydrates, developed seismic attribute workflows for advanced interpretation, Rock physics modeling, Inversion of seismic data and Machine Learning.

Professional Training

Dates	Place	Responsibility/Role
05/2019--	Workshop at IIT Guwahati, Assam (Two days)	Basics understanding of seismic acquisition, processing, interpretation and subsurface modeling
2/2017--	Disc Course by **Dr. Doug Oldenburg**	Fundamentals of Geophysical Electromagnetic, Application of EM

06/2013 – 08/2013	Intern (Department of Geophysics, KUK)	Stochastic simulation of strong ground motion of 1986 Dharamsala earthquake. Generation of model spectrum, Generation of Random Number, Generation of window function, Transformation of windowed noise into frequency domain, Normalization of the spectral amplitude

Research Publications

Full-Length Research Articles/ Abstracts:

2023

- Kumar, P.C., **Kumar, J.** and Sain, K. 2023. Fluid flow from source to the surface: A case study from the Indo-Gangetic peripheral Foreland Basin. ***Results in Geophysical Sciences,*** 14(100057), 1-12**.**
- **Kumar, J.,** Kumar, P.C. and Sain, K. 2023. Delineation of Oil-Water-Contact in Tipam reservoir: A study from Upper Assam Basin, NE India**.** ***Geological Journal,*** 1-11. DOI: 10.1002/gj.4789**.**
- **Kumar, J.,** Sain, K., 2023. Empirical mode decomposition approach for delineating gas-hydrates and free gas in Mahanadi Offshore, eastern Indian margin. **Exploration Geophysics**, 54, 88-100.
- **Kumar, J.,** Kumar, P.C. and Sain, K. 2023. Appraisal of reservoir porosity using a machine learning approach: A study from the Eocene-Miocene interval of the Upper Assam Basin, NE India ***Geological Journal,*** *Accepted.*
- Kumar, P.C., **Kumar, J.** and Sain, K. 2023. Cenozoic tectonic subsidence in the Upper Assam Basin: A case study from NE India. ***Geosystems and Geoenvironment (In Review).***

2022

- **Kumar, J.,** Sain, K. and Arun, KP., 2022. Time-frequency analysis for delineating gas hydrates and free gas in the Mahanadi offshore, India, **Exploration Geophysics**, 53. 52-65.
- **Kumar, J.**, and Sain, K., 2022. Prediction of missing log using Machine learning. Presented in 3rd Triennial Congress of **FIGA**.

2021

- **Kumar, J.,** Sain, K. and Gogoi, T., 2021. Structural Attribute elucidating subsurface structure from 3D seismic reflection data: A North-East Himalayan case study, 42 **Annual Convention, Seminar and Exhibition on Exploration Geophysics**, 1-3 December, 2021.

2020

- Arun, K.P., Sain, K. and **Kumar, J.,** 2020. Application of constrained AVO inversion: 2-D modelling of gas hydrates and free gas in Mahanadi basin, India. **Journal of Natural Gas Science and Engineering**, p.103287.

2019

- **Kumar, J.,** Sain, K. and Arun, K.P., 2019. Seismic attributes for characterizing gas hydrates: a study from the Mahanadi offshore, India. **Marine Geophysical Research**, 40(1), pp.73-86.

- **Kumar, J.** and Sain, K., 2019. Application of Empirical mode decomposition for delineating gas hydrates and free gas in the Mahanadi offshore Basin, India. Presented in 3rd **NGRSM**, 2019.

2018

- Arun, K.P., Sain, K. and **Kumar, J.,** 2018. Elastic parameters from constrained AVO inversion: Application to a BSR in the Mahanadi offshore, India. **Journal of Natural Gas Science and Engineering**, 50, pp.90-100.
- **Kumar, J.** and Sain, K., 2018. Seismic attributes for delineation of gas hydrates: A case study in the Mahanadi offshore basin. Presented in 52nd **Annual convention of Indian Geophysical Union**.

2017

- **Kumar, J.** and Sain, K., 2017. Application of spectral decomposition for gas hydrate exploration: a study from Mahanadi offshore, India. In SEG, Technical Program Expanded Abstracts 2017 (pp. 2195-2199). **Society of Exploration Geophysicists**.

2016

- K.P. Arun and **Kumar, J.,** 2016. Appraisal of gas hydrates and free-gas saturation in the Mahanadi offshore, Presented in 1st Triennial Congress of FIGA and 53rd Annual Convention of **Indian Geophysical Union**.

2015

- KK Munda, KP Arun, S Krishnan, **Kumar, J.,** Sain, K., 2015. Application of seismic attributes in enhancing thin beds: An Example from North Sea, **Society of petroleum Geophysicist, India**.

2014

- **Kumar, J.,** Rohila, A., Sandhu, K., and Kumar, D., 2014. Stochastic simulation of strong ground motion of 1986 Dharamsala earthquake. Presented in 50th Annual convention of **Indian Geophysical Union**.

2012

- **Kumar, J.,** Rohila, A., Sandhu, K., and Kumar, D., 2012. Estimation of earthquake source parameters and intrinsic attenuation from the strong ground motions. Presented in the 49th Annual Convention of **Indian Geophysical Union**.

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