Dr. Priyadarshi Chinmoy Kumar, PhD
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Research Statement

My research is engrossed in exploring the subsurface geological environment, particularly in understanding the tectonic evolution of sedimentary basins (both onshore and offshore). In my research, I primarily rely on active seismic methods (mainly reflection seismic) integrated with borehole logs for interpreting subsurface structures and basin stratigraphy. I use various interpretation techniques to examine the seismic data and pen down logical inferences thoroughly. Apart from using the geophysical tool, the seismic method, I also possess expertise in machine learning workflows used to automate interpreting seismic data. Through my research, I have contributed to designing different new meta-attributes for generating neural models of different geologic structures and associated phenomena, e.g., magmatic bodies, mass flow processes, and fluid upwelling phenomena. I am genuinely fascinated and excited when I gaze at seismic images in my workstation.

Research Interests

- Exploration geophysics, geological and geophysical interpretation
- Structural and stratigraphic interpretation, seismic geomorphology
- 3D seismic and attribute workflows
- Machine Learning and its applications
- Sedimentary basin studies

Education

- 2014-19: PhD (App. Geophy.), AcSIR-National Geophysical Research Institute, Hyderabad
- 2010-13: M.Sc.(Tech) Geophysics, Department of Geophysics, Andhra University, Vizag
- 2006-09: B.Sc.(Phy), College of Basic Science and Humanities, OUAT, Bhubaneswar

Professional Experience

- 11/2020 – present: Scientist- "B"
- 01/2020-11/2020:   Research Associate, WIHG Dehradun
- 08/2013-09/2014:   Geophysicist, DEEP Industries Limited (E&P), Ahmedabad
- 05/2013-07/2013:   Research Intern, GERMI, Gandhinagar, Gujarat, India
- 05/2012-06/2012:   Industrial Trainee, ONGC (WOB), Mumbai, India

Awards and Fellowships

- 2021: "Best Paper Award", WIHG
- 2021-24: Associateship-Indian Academy of Science
- 2021: NASI-Young Scientist Platinum Jubilee Awardee, National Academy of Science-India
- 2021: "Best Doctoral Thesis Award", Association of Exploration Geophysics (AEG)
- 2020: "Best Paper Award", KDMIPE-ONGC
- 2019: Prof. R.C Misra Gold Medal Award, WIHG
- 2019: Dr. JG Negi Young Scientist Award, IGU

- 2012: ONGC Meritorious Fellowship, ONGC
- 2014: DST-INSPIRE Fellowship, Govt. of India

National and International Collaborations

International & National Collaborators

- Dr. Tiago M Alves (3D Seismic Lab, Cardiff University, UK)
- Dr. Qiliang Sun (Emeritus Professor, China University of Geoscience, Wuhan)
- Dr. Heather Bedle (University of Oklahoma, USA)
- Dr. Kamaldeen O Omosanya (Oasisgeokonsult, Trondheim Norway)
- Dr. Ovie Emmanuel Eruteya (Department of Earth Sciences, University of Geneva)
- Dr. Yakup Niyazi (University of Western Australia)
- Dr. Nicholas Waldmann (University of Haifa, Israel)
- Dr. Animesh Mandal (Asst. Professor, IIT Kanpur, India)
- Dr. Kalachand Sain (Director, WIHG, India)

Voluntary Editorial Services (as Reviewer)

- Journal of Applied Geophysics, Elsevier
- Journal of Marine and Petroleum Geology, Elsevier
- Exploration Geophysics, CSIRO
- Interpretation, SEG
- Journal of Petroleum Science and Engineering, Elsevier

Research Publications

Full-Length Research Articles

2023

Source:https://scholar.google.com/citations?user=t7I9504AAAAJ&hl=en&oi=ao
Source:https://www.researchgate.net/profile/Priyadarshi-Kumar

- **Kumar, P.**C., Sain, K. and Omosanya, K.O. 2023. Growth and Kinematics of strike-slip faults: A case study from the Dibrugarh field, Upper Assam foreland basin, NE India. ***Journal of Marine and Petroleum Geology,*** 153, 106291, 1-16
- **Kumar, P.**C. and Sain, K. 2023. Machine Learning elucidates the anatomy of buried carbonate reef from seismic refection data. ***Artificial Intelligence in Geosciences***, 4, 59-67
- **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 (In Review)***
- 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 (In review)***
- 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 (In review)***
- **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)***
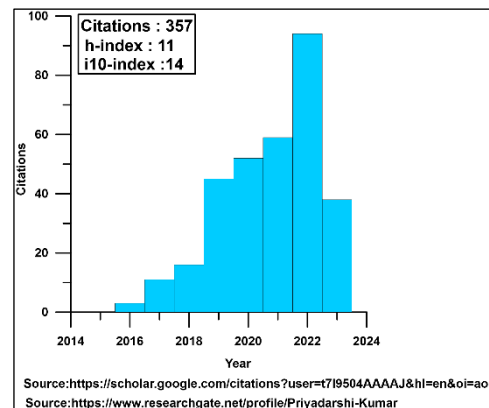
2022

- **Kumar, P.**C. and Sain, K. 2022. Seismic Texture of Tertiary successions: insights from Tipam and Barail Formations in the Upper Assam Basin, NE India. *Journal of Geological Society of India,* 98:1671-1679, 1-9.
- **Kumar, P.**C., Niyazi, Y., Ovie, O.E., Moscariello, A., Warne, M., Ierodiaconou, D. and Sain, K. 2022. Anatomy of intrusion related forced fold in the offshore Otway Basin, SE Australia. *Journal of Marine and Petroleum Geology*, 141, 105719, 1-12.

2021

- **Kumar, P.**C., Alves, T. and Sain, K. 2021. Submarine canyon systems fusing the migration of sub-surface fluid in the Canterbury Basin, South Island, New Zealand. *Nature Scientific Reports, 11(1), 1-16*.
- **Kumar, P.C.**, Omosanya, K. O., Eruteya, O.E. and Sain, K. 2021. Geomorphological characterization of basal flow markers during recurrent mass movement: a case study from the Taranaki Basin, offshore New Zealand. *Basin Research, 33(4), 2358-2382.*
- **Kumar, P.C.**, Alves, T. and Sain, K. 2021. Forced Folding in the Kora Volcanic Complex, New Zealand: A case study with relevance to the production of hydrocarbons and geothermal energy. *Geothermics, 89(101965), 1-17*

2020

- **Kumar, P.C.** and Sain, K. 2020. A machine-learning tool for interpretation of Mass Transport Deposits from seismic data. *Nature Scientific Reports,* 10(1), 1-10.
- **Kumar, P.C.** and Sain, K. 2020. Interpretation of magma transport through saucer sills in shallow sedimentary strata using an automated machine learning approach. *Tectonophysics,* 789, 228541, 1-16.

2019

- **Kumar, P.C.**, Omosanya, K. O., Sain, K. 2019. Sill Cube: An automated approach for the interpretation of magmatic sill complexes on seismic reflection data. *Journal of Marine and Petroleum Geology, 100, 60-84.*
- **Kumar, P.C.**, Sain, K. and Mandal, A. 2019. Delineation of a buried volcanic system in Kora prospect off New Zealand using artificial neural networks and its implications. *Journal of Applied Geophysics, 161, 56-75.*
- **Kumar, P.C.**, Omosanya, K.O., Alves, T. and Sain, K. 2019. A neural network approach for elucidating fluid leakage along hard-linked normal faults**. *Journal of Marine and Petroleum Geology, 110, 518-538.*
- Sain, K. and **Kumar, P.C.** 2019. Human and Machine: An amalgamation to aid seismic interpretation. *ONGC Bulletin, 54 (2), 1-14. (conferred with Best Paper Award)*

2018

- **Kumar P.C.** and Sain, K. 2018. Attribute amalgamation-aiding interpretation of faults from seismic data: An example from Waitara 3D prospect in Taranaki basin off New Zealand. *Journal of Applied Geophysics, 159, 52-68. (Most Downloadable article by Elsevier)*

2017

- **Kumar P.C.** and Mandal, A. 2017. Enhancement of fault interpretation using multi-attribute analysis and artificial neural network (ANN) approach: A case study from Taranaki Basin, New Zealand. *Exploration Geophysics, 49(3), 409-424.*

2016

- Singh, D., **Kumar, P.C.** and Sain, K. 2016. Interpretation of gas chimney from seismic data using artificial neural network: A study from Maari 3D prospect in the Taranaki basin, New Zealand. *Journal of Natural Gas Science and Engineering, 36, 339-357.*

Conference Articles

- **Kumar P. C.** 2016. Application of geometric attributes for interpreting faults from seismic data: An example from Taranaki Basin, New Zealand. Paper presented at SEG Annual Convention, *Society of Exploration Geophysics, 2077-2081.*
- Singh, D., **Kumar, P.C.** and Sain, K. 2016. Interpretation of gas chimney in the Maari 3D field of southern Taranaki Basin, New Zealand. Paper presented at SEG Annual Convention, *Society of Exploration Geophysics, 2082-2086.*
- Srivastava, E., Mandal, A and **Kumar, P.C.** 2017. Seismic data conditioning and multi-attribute analysis for enhanced structural interpretation: A case study from offshore Nova Scotia, Scotian Basin. Paper presented at SEG Annual Convention, *Society of Exploration Geophysics, 2225-2229.*

Book Chapters

- Sain, K. and **Kumar P. C.** 2021. Seismic, Artificial Intelligence to Neural Intelligence for Advanced Interpretation, In Gupta H.K., Ed., 2nd Edition, *Encyclopedia of Solid Earth Geophysics*, Springer, The Netherlands.

Books-authored/Edited volume:

- Sain, K. and **Kumar P. C.** 2022. "**Meta-attributes and Artificial Networking: A New Tool in Seismic Interpretation**", Eds., AGU-John Wiley & Sons.

I thank you for going through my research details. You can contact me for any research collaboration/ research guidance/ discussions over my email or through telephone. However, I mostly prefer answering emails, rather talking for long hours over phone.

Priyadarshi Chinmoy Kumar