CURRICULUM VITAE

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Personal Information

Date of Birth: January 5th, 1992
Place of Birth: Patna, Bihar, India
Citizenship: Indian

Research Interests

My research interests lie in the field of **crustal deformation, tectonics, and geophysics**, with a particular focus on **seismicity and fault zone mechanics**. I am deeply interested in understanding both **tectonic and non-tectonic deformation processes**, and how these influence the Earth's surface and subsurface dynamics. My specific research areas include:

- **Tectonic Deformation and Fault Mechanics**: Investigating the processes that drive tectonic movements, fault slip behaviours, and seismic hazards, particularly in regions of complex tectonic settings such as the **Delhi Haridwar Ridge**.
- **Non-Tectonic Deformation**: Studying the impacts of human-induced activities such as **groundwater extraction** and **urbanization** on subsurface stress regimes, and the role of **seasonal hydrological loading** on crustal deformation.
- **Numerical and Analog Modeling**: Applying **Finite Element Modeling (FEM)** and other computational techniques to simulate fault zone development, flow localization in fractured rocks, and the mechanics of rock slope failures under varying environmental and stress conditions.
- **Seismicity and Geophysical Data Analysis**: Utilizing **seismicity clustering analysis**, **geodetic data** (GPS/GNSS), and other geophysical techniques to quantify deformation patterns and seismic risks. I have a particular interest in integrating geodetic and seismic data for understanding **earthquake cycle dynamics**.
- **GNSS and Geodetic Studies**: Installing and maintaining **GPS/GNSS stations** to monitor real-time crustal movements and processing the data using advanced software like **GAMIT/GLOBK** for precise tectonic and geodetic analysis.

I am also keen to explore how these studies can contribute to **geohazard assessments** and **mitigation strategies**, particularly in regions prone to earthquakes and anthropogenic stress.

Academic Qualification

- **Doctor of Philosophy (Ph.D.):** **(2019 to Present)**
  National Institute of Technology, Rourkela (Odisha)
  Supervisor: Prof. Bhaskar Kundu
  Topic: Tectonic and Non-Tectonic Deformations around Delhi Hardwar Ridge, North India
- **Post-Graduation:** **(2015-2017)**
  Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur (Maharashtra)
  M.Sc. Geology
- **Graduation:** **(2012-2015)**
  Patna Science College, Patna University (Bihar)
  B.Sc. Geology (Hon's)

Employment

- **Project Engineer:** **(2018-2019)**
  Project, "*Rate State Temperature and Pore Pressure Friction Modelling of Rock Slopeand Failure Hazard assessment*". Sponsored by NRDMS-DST Govt. of India. Supervisor: Dr. Arun Kumar Singh, Department of Mechanical Engineering, Visvesvaraya National Institute of Technology Nagpur.

Grants & Awards

- **Department of Science and Technology (DST)**: Research Grant Awarded Fellowship from **March 2018 to November 2019**
- **Ministry of Earth Sciences (MoES)**: Research Grant Awarded Fellowship from **November 2019 to July 2023**
- **Science and Engineering Research Board (SERB)**: International Trevel Support for AGU fall meeting **2023**
- **Council of Scientific & Industrial Research (CSIR):** International Trevel Grant for AGU fall meeting **2023**
- **American Geophysical Union (AGU):** Tectonophysics Caregiver Award **2023**
- **GATE:** qualified **2019**

Experience & Skills

Communication Skills:

- **Effective Communication & Presentation:** Presented data clearly and confidently to audiences of various sizes, both domestically and internationally, tailoring the content and style to suit the audience's knowledge level.
- **Scientific Writing & Documentation:** Authored scientific papers in international peer-reviewed journals, addressed technical reviewer queries, and composed funding proposals along with regular project progression reports.

Interpersonal Skills:

- **Collaboration & Teamwork:** Worked closely with fellow scientists to define objectives, methodologies, and conclusions, while actively encouraging dialogue and exchanging constructive feedback. Learned to delegate responsibilities effectively.
- **Constructive Interaction:** Fostered positive professional relationships by providing and receiving feedback and support, facilitating team success.

Adaptability:

- **Cultural & Professional Flexibility:** Successfully collaborated with professionals across various disciplines, cultures, and levels of expertise. Thrived in both independent and team environments.
- **Self-Motivation & Perseverance:** Adapted to new environments, improved English proficiency, and demonstrated resilience while living and working abroad.

Management & Organization:

- **Project Management:** Managed multiple projects and collaborations simultaneously, setting clear goals, developing creative solutions, and meeting deadlines.
- **Problem Solving & Critical Analysis:** Efficiently gathered and evaluated information to troubleshoot issues, drawing on both personal experience and the expertise of others to make informed decisions.

Technical Skills:

- **Numerical Modeling & FEM Analysis:** Proficient in tools like ANSYS, COMSOL Multiphysics, 3DEC, Plaxis 2D & 3D, GEO5, Settle3D, Slide, Pylith, ASPECT, FLAC, and Phase.
- **Data Processing:** Skilled in GPS inversion (GAMIT GLOBK), InSAR analysis.
- **Computer Language:** MATLAB, Python, R, and C++.
- **Advanced Computing:** Strong skills in Linux, Amazon aws, ISO and Windows os.
- **Graphical Skills:** MS Office, CorelDraw, AutoCAD, and Generic Mapping Tools, Grapher, Surfer, Global Maper, ArcMap, ArcGIS, QGIS, Adobe Illustrator.
- **Instrumental Expertise:** Clinometer, Zooming photographic microscope, Tribometer, and Earthquake simulator for lab-scale experiments with rate-state-dependent friction.

Expedition skills:

- Site selection, Installation and data collection of GNSS receivers (GR50)

Outreach skills:

- Web development for official website (https://www.tectonicgeodesylab.in/)
- Video documentation for outreach program: (https://www.youtube.com/@tectonicgeodesylab5991)

Mentoring skills: (Number of master's students mentored in total - 6)

- 2019-21, Dissertation, Title: Role of lower crustal rheology in extensional deformation of Basin and Range Province.
- 2023-24, Dissertation Title: Crustal Deformation Studies using Geodetic and Satellite Data.
- 2024-25, Dissertation Title: Along strike segmentation and associated deformation along the Himalayan Arc.

Peer Reviewed Publications

- **Tiwari, D. K.,** Jha, B., Kundu, B., Gahalaut, V. K., & Vissa, N. K. (2021). Groundwater extraction-induced seismicity around Delhi region, India. *Scientific reports*, *11*(1),10097. (Impact Factor: 3.8) https://doi.org/10.1038/s41598-021-89527-3
- Sahoo, S., Senapati, B., Panda, D., **Tiwari, D. K**., Santosh, M., & Kundu, B. (2021).Tidal triggering of micro-seismicity associated with caldera dynamics in the Juan de Fuca ridge. *Journal of Volcanology and Geothermal Research*, 107319. (Impact Factor: 2.986) https://doi.org/10.1016/j.jvolgeores.2021.107319
- Sahoo, S., **Tiwari, D. K.,** Senapati, B., Panda, D., & Kundu, B. (2021). Eruption cycles of Mount Etna triggered by seasonal climatic Rainfall. *Journal of Geodynamics*, 101896. (Impact Factor: 2.673) https://doi.org/10.1016/j.jog.2021.101896
- **Tiwari, D. K**., Hari, M., Jha, B., Tyagi, B., & Kundu, B. (2023). Delhi urbanization footprint and its effect on the earth's subsurface state-of-stress through decadal seismicity modulation. *Scientific reports*, 13(1), 11750. (Impact Factor: 3.8) https://doi.org/10.1038/s41598-023-38348-7
- Senapati, B., Lindsey, E.O., Panda, D., **Tiwari, D. K**., Yadav, R.K., & Kundu, B. (2022)."Double Puzzle" at the Shumagin seismic gap, Alaska Peninsula: intra-slab strike-slip faulting loaded by lateral variations in megathrust fault friction" *Geophysical Journal International*, 1471–1483. (Impact Factor: 3.3) https://doi.org/10.1093/gji/ggae002
- Sahoo, S., Kundu, B., Simona P., Yadav R.K., **Tiwari, D. K**., & Jin S. (2023). Feedback responses between endogenous and exogenous processes at Campi Flegri caldera dynamics, Italy. *Bulletin of Volcanology,86(3),*1-22. (Impact Factor: 3.5) https://doi.org/10.1007/s00445-024-01719-7

Publications Under Review

- Dalal, P., Kundu, B., Sreejith, K. M., Senapati, B., **Tiwari, D.K.**, Vissa, N. K., Jha, B. & Jin, S. (2024). Influence of anthropogenic groundwater unloading in Haouz plain on the 8 September 2023, Mw 6.8, Al Haouz, Morocco Earthquake. *Bulletin of Seismological Society of America*.
- Dalal, P., Hari, M., Xu, Y., Senapati, B., Gautam, P., **Tiwari, D.K.,** Bürgmann, R., & Kundu, B. (2024). Deformation dynamics and hazard of slow-moving landslides: Joshimath event, Uttarakhand Himalaya. *Engineering Geology*.
- Kundu, B., Dixon, J., **Tiwari, D. K.,** and Sahoo, S. (2024). "Can an earthquake belt out a tune like a loudspeaker at a rock concert? *Frontiers for Young Minds.*
- Ray, S., Kundu, B., Sahoo, S., & **Tiwari, D.K.** (2024). Discerning double coseismic travelling ionospheric disturbances following the April 2024 Hualien Earthquake, from GNSS TEC. *Advances in Space Research.*

Conference & Symposium

- Presented Poster in AGU Fall Meeting 2023, "*Delhi urbanization footprint and its effect on the earth's subsurface state-of-stress through decadal seismicity modulation*". San Francisco, USA.
- Participated in Workshop on "*Chandaryaan-3 Science Data Analysis Workshop"* ISRO ISDC Center Bengaluru.
- Participated in 3rd Research Scholars Day 2019 and presented poster on "*FailureAnalysis of the Road Cut Slope along NH-7 in Uttarakhand*" VNIT Nagpur.
- INCAM 2019, *Presented* "*The Effect of Dilatancy, Thermal-pressurization and Hydraulic Diffusivity on Stick-Slip Instability and Rock Slope Failure*". IIT Mandi.
- Participated in National Seminar on "*Application of Microfossil Proxy's in SolvingEarth and Environmental Problems*" PG Department of Geology RTMNU, Nagpur.
- Participated in National Symposium on "*Challenges & Strategies in MineralExploration and Mining*" PG Department of Geology RTMNU, Nagpur.

Referees

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Deepak Kr. Tiwari

Place: - Rourkela
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(DEEPAK KUMAR TIWARI)