# DR. PARAG JYOTI DUTTA

## Associate Professor | Research Leader in Spatial Data Analytics

*Accomplished Associate Professor and Research Investigator with 25+ years of expertise in geospatial analytics, geostatistics, and machine learning applied to economic and environmental geology. Seeking a director/head-level role to lead research, curriculum innovation, and international collaborations, leveraging unique academic and industry experience to drive strategic impact and innovation.*

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## PROFESSIONAL SUMMARY

- **Over 25 years of experience** spanning academia, industry, and research in **geoinformatics, spatial data analytics, and predictive modeling**, integrating **geostatistics and machine learning** for **ore deposit evaluation**, **landslide susceptibility**, and **environmental risk assessment** — a globally rare expertise.
- Led **high-impact research projects** involving **statistical and deterministic landslide modeling**, **ore body and mineral reserve estimation**, and **Python-based geostatistical co-simulation**, with proven ability to **translate research into real-world applications** across **defence, mining, groundwater, infrastructure, and environmental management**.
- Experienced in **curriculum design, international collaborations, and academic leadership**, recognized as **Top Performing Mentor (NPTEL 2022)**, with a strong record in **Ph.D. and M.Sc. supervision, peer-reviewed publications, and global scientific research partnerships**
- **LinkedIn**: https://www.linkedin.com/in/paragjdutta/
- **Researchgate:** https://www.researchgate.net/profile/Parag-Dutta-3

## CORE COMPETENCIES

Curriculum Development, Research Integration, Program Development, Strategic Planning, Technical Grant Writing, Team Building, Stakeholder Management, GIS, Geospatial Data Analysis & Modeling, Geostatistics, Machine Learning, Problem-Solving & Analytical Thinking, Teaching & Research Leadership, Collaboration & Networking, Project & Grant Management, Communication & Presentation

## WORK EXPERIENCE

### Associate Professor

**Cotton University (Guwahati, India)** *(2003 - Present)*

- **Lead teaching and academic programs in Environmental and Economic Geology**, including lectures, practical classes, and curriculum development for undergraduate and postgraduate students. Mentoring Students to achieve academic excellence.
- Spearhead research initiatives at the interface of **geostatistics and machine learning**, for developing innovative spatial prediction methodologies for landslide susceptibility, mineral prospecting, ore body evaluation, soil & water geochemistry, and medical geology.
- **Manage national/international collaborative research** integrating interdisciplinary outlooks.
- **Peer reviewing** of journal publications and supervising students' research projects.
- **Conduct funded research project management,** including grant proposal writing, planning, execution, budgeting, and reporting for grants from DST, UGC, and TEXMiN Foundation.
- Translate research findings into practical, industry-relevant applications
- Contribute to **strategic academic leadership**, guiding curriculum design, research vision, and institutional collaborations.

**Achievements:**

- **Published high-impact research papers,** including a 2024 paper in the journal Machine Learning: Science and Technology.
- Research recognized globally for coupling geostatistics with machine learning to create accurate spatial prediction models.
- Recognized as Top Performing Mentor by **NPTEL (2022) for mentoring** M.Sc. students in Mineral Resources and Environmental Geology.

### Geospatial Solutions Executive

**Rolta India Ltd.** *(2000 - 2003)*

- **Provided onsite technical operations support** in digital photogrammetry, satellite image processing, and GIS to Image Interpretation Teams (Indian Army), creating a digital library of military targets to enable critical geospatial intelligence for mission planning and logistics.
- **Supported satellite image processing and GIS** for clients in soil surveys, land use planning, forestry, agriculture, natural resources, and environmental monitoring and management.

**Achievements:**

- Enhanced operational **decision-making** by delivering real-time, geospatial intelligence
- **Recognized for reliability,** and security compliance in handling sensitive military data.

## EDUCATION

**Ph.D. in Geological Sciences** (2020)
University of Gauhati, Assam, India, (Thesis Title: Landslide Susceptibility Assessment of Narakasur Hill in Guwahati (Assam), India, using Statistical and Deterministic Models)

**Master of Technology (M.Tech) in Earth Sciences – Geo-Exploration** (2000)
Indian Institute of Technology (IIT) Bombay, India, (Grade: CPI = 8.29 out of 10.00)

**Master of Science in Geology** (1998)
University of Delhi, India, (Grade: 66.92%)

# PROJECTS

**Geogenic Causes and Exposure Reconstruction for Lung Cancer Incidence in Northeast India (Non-Sponsored Research)**
**Role:** Principal Investigator / Researcher
- Applied advanced geospatial analytics and predictive modeling to identify high-risk geochemically polluted zones.
- Integrated rock-soil-water datasets from multiple sources for robust environmental exposure reconstruction.
- Generated insights to inform public health strategies and environmental risk assessment.

**Development of algorithms and software plugins for Geostatistical Co-Simulation and Regionalized Classification, for aiding (ore) deposit scale modelling**
- Role: Principal Investigator
- Developed algorithms and Python plugins for geostatistical co-simulation, supervised classification, and deep learning for orebody evaluation

**Susceptibility assessment of rainfall-induced shallow landslides by a physically-based modelling approach**
- Role: Principal Investigator
- Predicted the locations of rainfall-triggered shallow landslides using a grid-based slope stability model involving transient rainfall infiltration

**Influence of spatial resolution and accuracy of TanDEM-X DEM in the performance of a physically-based distributed model in forecasting the spatial occurrence of shallow rainfall-induced landslides**
- Role: Principal Investigator
- Examined the influence of spatial resolution and accuracy of TanDEM-X DEM on the model performance for shallow landslide forecasting
- Created a 5m resolution DEM by Interferometric processing of CoSSC pairs of SAR data acquisitioned by the TanDEM-X satellite mission

**Geostatistical mineral reserve estimation and classification of the Hugo (S) porphyry Cu-Au-Mo deposit in South Gobi, Mongolia, for Rio Tinto**
- Role: Principal Consultant
- Conducted geostatistical 3D block modeling of the Hugo (South) porphyry Cu-Au deposit in Mongolia, for resource estimation & classification

**Vertical Electric Sounding (VES) and modeling for groundwater targeting at six sites - Silchar, Aizawl, Mariani, Mokokchung, Tezu and Roing on behalf of ESS Engineers Pvt. Ltd. for Power Grid Corporation of India**
- Role: Principal Consultant
- Conducted Vertical Electric Sounding (VES) for targeting potential groundwater depth zones for Power Grid Corporation of India.

**Landslide hazard zoning in the Narakasur hill of Guwahati for local development planning - A Pilot Study**
- Role: Co-Principal Investigator
- Led landslide hazard zoning efforts by statistical learning methods in the Narakasur hill to support local development planning.

# SELECTED PUBLICATIONS

- Borah, A., **Dutta, P. J.** & Emery, X. **(2025)** Geostatistically Enhanced Learning for Supervised Classification of Wall-Rock Alteration Using Assay Grades of Trace Elements and Sulfides. *Minerals*, *15*, 1128. DOI: 10.3390/min15111128
- **Dutta, P. J.** & Emery, X. **(2024)** Classifying rock types by geostatistics and random forests in tandem. *Machine Learning: Science and Technology*, 5, 025013. DOI: 10.1088/2632-2153/ad3c0f
- Sarma, K. & **Dutta, P. J. (2021)** Soil Erosion Estimation of Palasbari in Northeast India by RUSLE Model. *Bulletin of Pure and Applied Sciences – Geology*, 40F (2): 129-141. DOI: 10.5958/2320-3234.2021.00012.3
- **Dutta, P. J.**, Laskar, J. J. & Sarma, S. **(2019)** A Field Verification Based Statistical Approach toward Landslide Susceptibility Assessment. *Bulletin of Pure and Applied Sciences – Geology*, 38F (2): 266-273. DOI: 10.5958/2320-3234.2019.00020.9
- **Dutta, P. J.**, Sarma, S. & Laskar, J. J. **(2017)** Predicting the Spatial Distribution of Rain-Induced Shallow Landslides by applying GIS and Geocomputational Techniques: A Case Study from North East India. *International Journal on Recent and Innovation Trends in Computing and Communication*, 5(5): 1306–1319. DOI: 10.17762/ijritcc.v5i5.698
- Sarma, S., **Dutta, P. J.** & Borgohain, R. B. **(2017)** Susceptibility Assessment of Rainfall-induced Shallow Landslides using a GIS-supported Deterministic Analysis – A Pilot Study. *International Journal of Advanced Remote Sensing and GIS*, 6(1): 2281-2291. DOI: 10.23953/cloud.ijarsg.291
- Persichillo, M. G., **Dutta, P. J.**, Bordoni, M., et al. **(2016)** Nonlinear regression technique to assess the landslide susceptibility of the Kalapahar hill, Guwahati, Assam State (India). *Rendiconti Online Società Geologica Italiana*, 41: 179-182. DOI: 10.3301/ROL.2016.123
- **Dutta, P. J. (2015)** Assessment of groundwater potential in a part of the Vedganga watershed of Kolhapur district, Maharashtra, by a GIS-based Bivariate statistical method. *International Journal of Advanced Earth & Environmental Sciences*, 3(1): 22-29
- **Dutta, P. J.** & Sarma, S. **(2013)** Landslide Susceptibility Zoning of the Kalapahar Hill, Guwahati, Assam State, (India), using a GIS-Based Heuristic Technique. *International Journal of Remote Sensing & Geoscience*, 2(2): 49–55

# PEER REVIEWER ROLES

- Journal **LANDSLIDES**, Springer
- **Journal of Earth System Science (JESS)**, Indian Academy of Sciences & Springer
- Journal **Scientific Reports,** Springer Nature

# ACHIEVEMENTS

- Accredited as 'Top Performing Mentor' in India by NPTEL (Jan-June 2022) for mentoring an M.Sc. 2nd Semester batch in Mineral Resources: Geology, Exploration, Economics & Environment.
- Secured All India Rank - 6 in Graduate Aptitude Test in Engineering (GATE-98).
- Qualified in Joint CSIR-UGC National Eligibility Test (NET) for Lectureship Exam in 1998.

## CERTIFICATIONS

- **EO College Certificate Course on Radar Remote Sensing entitled ECHOES IN SPACE**- 2017 (Friedrich-Schiller-University Jena (FSU), Germany and European Space Agency
- **Certified Financial Planner (CFP),** FPSB India

## TECHNICAL SKILLS

- GIS / Remote Sensing software: ArcGIS, QGIS, SAGA GIS, GeoMedia Pro, ERDAS IMAGINE, ENVI SARscape 5.5, SNAP

- Geostatistical analysis software: Isatis.neo, Isatis.py

- Digital Photogrammetry software: Softcopy Photogrammetry Production System (Intergraph)

- Field tools: Borehole Augers, Electrical Resistivity Kit, Mini-disk Infiltrometer, Brunton Compass

- Electrical resistivity modelling software: IPI2Win, Surfer, USGS SER for 1D (VES)

- Geotechnical Laboratory Apparatus: Triaxial & Direct Shear apparatus for soil shear strength parameters, WP4 Potentiameter for soil suction, Casagrande Apparatus for liquid limit (LL), Hydrometer of soil particle size distribution

## ADDITIONAL INFORMATION

- **Passport**: Indian Passport No. S8206005
- **Visa**: United States B-2 Visa, valid until 29 Jan 2035 (issued on 30 Jan 2025)
- **Residence Address:** House No - 13, Jonali Path, R. G. Baruah Road, Guwahati 781024 (Assam), India
- **Language:** English, Hindi, Assamese (Native)