Personal Info:

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Gayeshpur, Malda Town,
732102, India

Mobile: +91-7547900655
(Call/WhatsApp**)**

Email: tamal.nitd@gmail.com

Nationality: **Indian**

Date of birth: **05/12/1992**
(December 5th, 1992)

Links (Embedded):

LinkedIn

Twitter

Research Gate

Vidwan: 501007

ORC Id: 0000-0002-1804-0831

Google Scholar

Skills:

CAD modeling

Coding in Python, MATLAB, Android

Commercial Software Operation (ETABS, COMSOL, ABAQUS, ANSYS, STAAD)

Structural Design (Steel & Concrete)

Non-Destructive Testing

Structural Dynamics

Finite Element Modelling

Analysis skills

Curriculum Vitae

Dr. Tamal Kundu

Structural Engineer, Assistant Professor, Researcher, NDT Expert

Summary

Currently, I am working as an Assistant Professor, and I am an experienced Structural Engineer with expertise in Cutting-Edge technologies and renowned FEM Software like, **ABAQUS**, **ANSYS**, **ETABS**, and **STAAD**. Also, have in-depth knowledge of structural engineering principles and methods and am a problem solver. Skilled in coding in platforms like **Python**, **MATLAB**, and **Android,** including **Analyzing Data**, **Data Optimization**, **Data Mining**, **AI**, **IoT** and creating **Cost-Effective** solutions. I am also a **member** of the **Editorial Board** at **NDT.net**, a regular reviewer of Springer Journal, and have received the **best paper** award from well-recognized universities.

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Work Experience

- **Assistant Professor in the Department of Civil Engineering, Swami Vivekananda University, Barrackpore, West Bengal, India**
  February 2024 - Present
  - Subjects offered: **Theory of Elasticity and Plasticity**, **Structural Dynamics and Earthquake Engineering**, **Structural Analysis**, **Design of Steel Structure**, **Civil Engineering Societal and Global Impact.**
  - Faculty in charge of **Advanced Structural Laboratory**
  - Also, Mentoring B.Tech. students and Supervising M.Tech. scholars.
  - Teach **ETABS**, **STAAD Pro**, and **AutoCAD** to undergraduate students and **MATLAB** and **ANSYS** to Postgraduate students.

- **Teaching Assistant at Department of Civil Engineering, National Institute of Technology Durgapur, West Bengal, India**
  July 2018 - July 2023
  - Offered the sessional of the following subjects: **Reinforcement Concrete Design**, Concrete Technology, Highway Engineering, **Structural Health Monitoring**, **FEM with Computation**, **Engineering Drawing**.
  - Used to teach undergraduate and postgraduate students to solve **FEM problems** with **Python** and **MATLAB**.
  - Took a couple of classes on introduction to **AI** for undergraduate students.

- **NDT Expert, SHM Lab, National Institute of Technology, Durgapur, Durgapur**
  August 2018 - August 2023
  - Gained in-depth knowledge of NDT instruments such as Schmidt Hammer, UPV Testing, Rebar Locator, and AE Instrument.

Languages:

Bengali

English

Hindi

Odiya

Assamese

Marathi

Research Index:

h-index: **6**
i10-index**: 3**

No. of Citations: **81**

Supervise:

Supervising Ph.D. Scholar: **1**

Supervised as Principal Supervisor: **2**

No. of M.Tech. Students Supervised: **16**

Mentor:

Mentor of B.Tech. Students: **63**

- Conducted NDT(s) for quality checking on the constructed structures such as Check Dams, Reservoirs, etc., as consulted by Govt. of West Bengal.

❖ **Assistant Professor in the Department of Civil Engineering, Sanaka Educational Trust Group of Institutions, Durgapur, West Bengal, India**
July 2017 - July 2018

- Subjects offered: **Structural Analysis**, **Soil-Structure Interaction**, **Engineering Hydraulics**.
- Also, sessional of the respective subjects were taught.
- Taught ETABS, STAAD Pro, and AutoCAD to undergraduate students.

Educational Qualifications

❖ **Doctor of Philosophy, Department of Civil Engineering under National Institute of Technology**
July 2018 – June 2024

- A novel damage detection system has been developed, and the thesis is entitled "**Detection and Monitoring of Damage in Rail Sections using Acoustic Emission Technique**" (Defended on 26th June 2024).
- Used Python platform to find "**Pearson Correlation Coefficient**".
- Developed ANN and SVM algorithms to find AE source locations using **MATLAB**.

❖ **M.Tech. in Structural Engineering, School of Civil Engineering under KIIT Deemed to be University**
July 2015 - July 2018

- Gained knowledge of advanced technologies in Civil Engineering.
- Also, did research and submitted a thesis on "**Non-linear Analysis of Plate Bending Problem using FEM and ANSYS**".

❖ **B.Tech. in Civil Engineering, IMPS College of Engineering and Technology under MAKAUT**
June 2011 - July 2015

- I gained concurrent and conventional technological knowledge related to civil engineering and the ethical implementation of the knowledge.
- Also, I did a final year project and submitted a thesis on "**Retrofitting with Self-Healing Concrete**".

Publications

Journal Publications:

1. **Kundu**, **T**., Datta, A. K., Topdar, P., & Sengupta, S. (2022). Optimal location of acoustic emission sensors for detecting rail damage. Proceedings of the Institution of Civil Engineers- Structures and Buildings. 177(3), 254-263. DOI: https://doi.org/10.1680/jstbu.21.00074

2. **Kundu**, **T**., Roy. P., Datta, A. K., & Topdar, P (2022). Health Monitoring of Indian Rail Section Using AE Technique Combined with upvm: An Experimental Study. Journal of Structural Engineering (Madras). 49(1), 47-58.

3. **Kundu**, **T**., Pal, A., Roy, P., Datta, A. K., & Topdar, P. (2023). Development of a novel real-time AE source localisation technique using ANN for health monitoring of rail section: an experimental study. Structural Health Monitoring, 14759217231171026. 23(1), 479-494. DOI: https://doi.org/10.1177/14759217231171026 (***Applied for Patent***)

4. **Kundu**, **T**., Datta, A. K., Roy, P., Topdar, P., Banerjee, A., Mukerjee, A., Karmakar, P., & Pal, A. (2023). An experimental study on health monitoring of rail section using an indigenously developed AE system. International Journal of Structural Engineering, 13(4), 463-481. DOI: https://doi.org/10.1504/IJSTRUCTE.2023.134346 (***Applied for Patent***)

5. Pal, A., **Kundu**, **T**., & Datta, A. K. (2023). Sensor-based smart diagnosis of rail defects using an ann model. Asian Journal of Civil Engineering, 24, 3001-3008. DOI: https://doi.org/10.1007/s42107-023-00690-6

6. Pal, A., **Kundu**, **T**., & Datta, A. K. (2023). Damage localization in Rail Section using single AE sensor data: An experimental Investigation with deep learning approach. Non-destructive Testing and Evaluation, 1-19. DOI: https://doi.org/10.1080/10589759.2023.2243004

7. Pal, A., **Kundu**, **T**., & Datta, A. K. (2023). Assessing the Influence of Welded Joint on Health Monitoring of Rail Sections: An Experimental Study Employing SVM and ANN Models. Journal of Non-destructive Evaluation, 42(4), 102. DOI: https://doi.org/10.1007/s10921-023-01014-z

8. Pal, A., **Kundu**, **T**., & Datta, A. K. (2024). Acoustic Emission-Based Assessment of Weld Effects on the Health Monitoring of the Rail Section: An Experimental Study. Engineering Research Express. 6(1). DOI: http://dx.doi.org/10.1088/2631-8695/ad26e1

Paper Presented in International Conferences:

1. **Kundu**, **T**., Pal, A., Roy, P., Datta, A., & Topdar, P. (2022). On the application of UPV in health monitoring of Indian Rail section using AE Technique. International Conference on Imaging NDE 2022 (ICINDE), August 26-27, Mahabalipuram, India. e-Journal of Nondestructive Testing Vol. 27(11). https://doi.org/10.58286/27467 (***Applied for Patent***)
2. **Kundu**, **T**., Pal, A., Roy, P., Datta, A. K., & Topdar, P. (2022, December). Application of UPV-instrument in health monitoring of Indian rail section using AE technique. Structural Engineering Convention 2022 (SEC 2022) In ASPS Conference Proceedings (Vol. 1, No. 5, pp. 1429-1439). https://doi.org/10.38208/acp.v1.673
3. **Kundu**, **T**., Pal, A., Datta, A., & Topdar, P. (2022). On Development of Smart Energy Efficient Damage Detection ANN Model for Indian Rail Section. 3rd Energy System Modeling and Optimization Conference 2022 (ESMOC- 2021) December 5-7, NIT Durgapur, West Bengal, India.

4. Pal, A., **Kundu**, **T**., Datta, A., & Topdar, P. (2022). Applicability of Energy Efficient ANN Model for Smart Diagnosis of Rail's Defect: A Study in Indian Perspective. 3rd Energy System Modeling and Optimization Conference 2022 (ESMOC-2021) December 5-7, NIT Durgapur, West Bengal, India.
5. Pal, A., **Kundu**, **T**., Datta, A., K. (2023). A Study on the Effect of Weld in Health Monitoring of Indian Rail Section using AE Technique. International Conference on Science, Technology & Sustainability (ICSTS – 2022) November 05–06, 2022, Maulana Mukhtar Ahmad Nadvi Technical Campus (Malegaon) Nashik, India
6. Gudipati, B., K., **Kundu**, **T**., Saha, N., Roy, P., Topdar, P. (2023). Localization of AE source in Plates using ANN approach: An Experimental Investigation. Sustainable Infrastructure: Innovations, Opportunities and Challenges (SIIOC 2023) April 20-21, National Institute of Technology, Karnataka, Surathkal.
7. Datta, S., **Kundu**, **T**., Pal, A., Datta, A., K. (2023). Selection of best-performing AE sensor for damage localization in rail section using Artificial Intelligence Model. International Conference on Creative and Innovative Solution in Civil Engineering (CISCE 2023) August 11-12, 2023, held at MNIT, Jaipur, Rajasthan, India. (***Applied for Patent***)
8. Majumder, R., Pal, A., **Kundu**, **T**., Datta, A., K. (2023). Enhancing AI Model for Fault Detection in Rail Through the Evaluation of AE Parameters with Proper Weighting Approach: A Comprehensive Study International Conference on Advances in Computer Engineering and Communication Systems (ICACECS-2023) September 22-23, Vallurupalli Nageswara Rao Vignana Jyothi Institute of Engineering and Technology, India.

Achievements

- Member of the Editorial Board at NDT.net (**Link**: https://www.ndt.net/myndt/?id=15940).
- Regular Reviewer of Springer Nature Journals.
- Won the best paper award at the international conference ICACES-2023 organised by Department of Computer Science and Engineering, Vallurupalli Nageshwara Rao Vignana Jyothi Institute of Engineering and Technology.

Courses

❖ **Advance Bridge Design and Construction, Indian Institute of Technology Madras (First Class (7.3 on 10 Point Scale))**

July 2016 - September 2016

- Gained knowledge about bridge engineering, which emphasizes sustainability and resilience, aiming to minimise environmental impact while ensuring long-term functionality in the face of natural disasters and climate change.
- Understand the sophisticated structural analysis techniques such as finite element analysis (FEA), which allows the model complex interactions between bridge components, predict stresses, and deflections, and optimise structural performance.

- Innovative structural forms such as cable-stayed bridges, suspension bridges, and arch bridges were rigorously discussed. Studied the case studies of iconic bridges, such as Howrah Bridge, Goldengate Bridge, Tower Bridge, etc., and explored bridge aesthetics and form for sophisticated design approaches.

❖ **Advances in Seismic Hazard Analysis and Soil Structure Interaction, Indian Institute of Technology Madras (First Class (7.2 on 10 Point Scale))**

July 2016 - September 2016

- Gained knowledge on developing sophisticated probabilistic seismic hazard assessment (PSHA) methodologies that consider a broader range of factors, such as historical seismicity, fault characteristics, ground motion prediction equations, and site-specific soil amplification effects.
- Understood the interaction between soil and structures, crucial for designing earthquake-resistant infrastructure. Also, studied the advances in soil-structure interaction modelling, including finite element analysis and boundary element method.
- Gained knowledge of site-specific soil properties in seismic analysis and design, including the characterisation of soil stiffness, damping properties, liquefaction susceptibility, and ground motion amplification effects. Analysed the data related to geotechnical site investigations, laboratory testing, and geophysical surveys to assess soil behaviour under seismic loading accurately.
- Understood the retrofitting of existing structures to enhance their seismic performance, and innovative retrofitting techniques such as base isolation systems, damping devices, and strengthening measures using advanced materials (e.g., fibre-reinforced polymers) have been studied to mitigate the effects of earthquakes.

Volunteering

NBA accreditation in Department of Civil Engineering, National Institute of Technology

December 2022 - March 2023

Worked as a volunteer at the Department of Civil Engineering, National Institute of Technology, Durgapur, to get NBA accreditation for the session 2023-2029.

NDT Specialist, SHM Lab (NIT Durgapur)

August 2018 - August 2023

Conducted various NDT experiments (using Schmidt Hammer, UPV, Rebar Locator, etc.) for quality checking on reservoirs constructed at Bankura, Purulia Forest Division, Govt. of West Bengal.

Research / Subject Interest

- Artificial Intelligence
- Internet of Things
- Structural Health Monitoring
- Non-Destructive Testing Techniques.
- Repair and Rehabilitation of Structures
- Structural Dynamics and Earthquake Engineering
- Structural Design (Concrete and Steel)

Hobbies

- Playing Harmonica, Flute, Guitar, Violin. Playing Chess.
- Terrace Gardening.
- Having street side food.

References

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