Kishore Kumar Tarafdar | **204070017**
Electrical Engineering | **Ph.D.**
Indian Institute of Technology Bombay | **Gender: Male**
Specialization: Electronic Systems | **DOB: 01/04/1990**

Examination	University	Institute	Year	CPI / % Credits
Doctorate	IIT Bombay	IIT Bombay	2026	8.79 **Core:** 28 **| Total:** 28
Post Graduation	National Institute of Technology Rourkela	National Institute of Technology Rourkela	2019	8.5
Post Graduation Specialization: Biomedical Engineering				
Graduation	West Bengal University of Technology	Bankura Unnayani Institute of Engineering	2013	7.27
Graduation Specialization: Electronics and Instrumentation Engineering				
Intermediate	ISC	Stepping Stone Model School	2008	68.00%
Matriculation	ICSE	Stepping Stone Model School	2006	71.00%

Ph.D. thesis submitted on December 23, 2025 at the Electrical Engineering Department, IIT Bombay

- **Thesis title:** *Interpretable and Frugal Learning Systems Employing Multiresolution Pyramids and Volterra Kernels*
- **Thesis Supervisor:** Dr. Vikram M. Gadre, Professor, Electrical Engineering Department, IIT Bombay
- **Fellowship and Grants in Ph.D.:** Prime Minister's Research Fellowship (PMRF)

MTech. thesis title: *Data mining based approach to study the effect of consumption of caffeinated coffee on the generation of the steady-state visual evoked potential signals.* DOI

- **Lab:** Medical Electronics and Instrumentation Laboratory
- **Supervisor:** Dr. Kunal Pal, Professor, Department of Biotechnology and Medical Engineering, NIT Rourkela
- **Co-supervisor:** Dr. Anwesha Khasnobish, Scientist, TCS Research and Innovation, Kolkata
- **Scholarship:** Graduate Aptitude Test in Engineering (GATE)

Teaching Assistantship (TA)

Institute TA:

1. Wavelets (EE 678), IIT Bombay (Autumn 2024, 2023, 2022)
2. Digital Signal Processing (EE 338), IIT Bombay (Spring 2024, 2023, 2022)
3. Electronic Systems Design (EE 616), IIT Bombay (Autumn 2021)
4. Medical Equipment Design Laboratory(BM 372), NIT Rourkela (Spring 2019)
5. Biomedical Signal Processing and Analysis (BM 611), NIT Rourkela (Autumn 2018)

External TA:

1. NPTEL: Foundations of Wavelets and Multirate Digital Signal Processing (Spring 2025, 2024, 2023)
2. R&D mentorship of undergraduate students of Sardar Patel Institute of Technology, Mumbai (Spring 2025, 2024, 2023)

Publications

1. *Book chapter:* In press
   K. K. Tarafdar and V. M. Gadre, "Multiresolution Volterra Systems for Frugal AI," in Selected Topics in Optical, Microwave and Communication Engineering: Select Proceedings of the International Conference ICMOCE 2025, ser. Lecture Notes in Electrical Engineering, D. Ghosh and P. K. Sahu, Eds. Singapore: Springer, 2025, in press.
2. *Conference paper:* DOI: *10.1109/ICASSP49660.2025.10890832*
   K. K. Tarafdar, A. Meher, M. Shah, Q. Saifee, D. Kumar, A. V. Nimkar, R. Jayasundar, and V. M. Gadre, "Multiresolution encoder-decoder convolutional neural network for magnetic resonance image segmentation," in ICASSP 2025-2025 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pp. 1–5, IEEE, 2025.
3. *Conference paper:* DOI: *10.1109/ICASSP49660.2025.10890832*
   D. Ghosh, G. Jos, **K. K. Tarafdar**, D. Kumar, R. Jayasundar, and V. M. Gadre, ''Spatiotemporal registration of longitudinal brain mri acquisitions by identifying and matching mul- tiresolution triplet pairs,'' in 2025 National Conference on Communications (NCC). IEEE, 2025, pp. 1–6.
4. *Conference paper:* DOI: *10.1109/ICMOCE57812.2023.10167363*
   N. Lakshmisha, **K. K. Tarafdar**, A. Butoliya, S. Tiwari, Q. Saifee, D. Kumar, R. Jayasundar, S. Mukherji, and V. M. Gadre, "Deep learning with sparse representations for biomedical signals," in 2023 International Conference on Microwave, Optical, and Communication Engineering (ICMOCE), pp. 1–8, IEEE, 2023.

5. *Conference paper:* DOI: *10.1109/SPCOM55316.2022.9840760*
K. K. Tarafdar, Q. Saifee, and V. M. Gadre, "A unified neural mra architecture combining wavelet cnn and wavelet pooling for texture classification," in 2022 IEEE International Conference on Signal Processing and Communications (SPCOM), pp. 1–5, IEEE, 2022.
6. *Journal article:* DOI: *10.1016/j.irbm.2020.11.001*
S. Nayak, **K. Tarafdar**, S. Banani, I. Banerjee, D. Kim, and K. Pal, "Comparing the hrv time-series signals acquired from cannabis consuming and non-consuming indian paddy-field workers by recurrence quantification analysis," IRBM, vol. 42, no. 6, pp. 466-473, 2021.
7. *Journal article:* DOI: *10.1016/j.dib.2020.105174*
B. K. Pradhan, **K. K. Tarafdar**, S. K. Nayak, A. Khasnobish, S. Chakravarty, S. S. Ray, and K. Pal, "Dataset for eeg signals used to detect the effect of coffee consumption on the activation of ssvep signal," Data in brief, vol. 29, p. 105174, 2020.
8. *Journal article:* DOI: *10.1016/j.compbiomed.2019.103526*
K. K. Tarafdar, B. K. Pradhan, S. K. Nayak, A. Khasnobish, S. Chakravarty, S. S. Ray, and K. Pal, "Data mining based approach to study the effect of consumption of caffeinated coffee on the generation of the steady-state visual evoked potential signals," Computers in biology and medicine, vol. 115, p. 103526, 2019.
9. *Book chapter:* DOI: *10.1016/B978-0-08-102420-1.00041-8*
K. K. Tarafdar, B. K. Pradhan, S. K. Nayak, A. Khasnobish, S. Bhattacharyya, and K. Pal, "Electroencephalogram-based brain–computer interface systems for controlling rehabilitative devices," in Bioelectronics and Medical Devices, pp. 857-890, Elsevier, 2019.
10. *Conference paper:* DOI: *10.1109/INDICON45594.2018.8987150*
K. K. Tarafdar, S. Subhadarshini, S. K. Nayak, K. Pal, A. Guntur, and S. Paul, "Recurrence quantification analysis of rr interval signals of female smokers and non-smokers during different phases of menstrual cycle," in 2018 15th IEEE India Council International Conference (INDICON), pp. 1-6, IEEE, 2018.
11. *Conference paper:* DOI: *10.1109/INDICON45594.2018.8987151*
S. Subhadarshini, S. K. Nayak, **K. K. Tarafdar**, S. S. Ray, and K. Pal, "Understanding the effect of smoking on the cardiac activity of young female smokers using emd analysis of ecg signals," in 2018 15th IEEE India Council International Conference (INDICON), pp. 1-6, IEEE, 2018.

Industry, Research & Development Experience and Apprenticeship Prior Post Graduation

Construction Engineer (Terminal Automation) ***[Experience Letter]*** *July 2015 - August 2017*
Lakshith Consulting Private Limited. Deputation in Chemtrols Industries Limited *Chennai, India*

Was on active duty for two years in *site #1* (Betkuchi) and *site #2* (Lumding) Terminals of Indian Oil Corporation Limited (North East Integrated State Office, Assam) from the start of the project until commissioning carrying out activities:

- **Site supervision and ground support in Civil construction**: Construction of New Control Room (15m ×8m ×5m) with false flooring, false ceiling and electrification at *site #1* and *site #2* for Terminal Automation.
- **Site supervision and ground support in Terminal Automation**: Installation, Testing and Commissioning of — (1) Tank Farm Management System (TFMS), (2) Safety Integrated System, (3) Integration of Motor Operated Valve (MOV), Double Block and Bleed Valve (DBBV) and Remotely Operated Shut-off Valves (ROSOV); (4) Erection and Commissioning of Power and Process Emergency Shut Down (ESD) systems at *site #1* and *site #2*.

Product Design Engineer (Transformer Workshop) ***[Experience Letter]*** *October 2014 - June 2015*
Maffick Instruments Private Limited *Ambala, India*

- **R&D activity**: Design, development, testing and commissioning of *1 KW Xenon-arc Lamp Power Supply Unit (PSU)* for use in ships.
Supervisor: Vipan Sarin, Owner, Maffick Instruments Pvt. Ltd.

Developed a PSU with commercial success (Make in India). The transformer design was my major contribution.

Graduate Apprentice (Department of Computational Instrumentation) ***[Recommendation]*** *October 2013 - September 2014*
CSIR-Central Scientific Instruments Organisation (Govt. of India) *Chandigarh, India*

- **R&D activity**: Acquisition of grain image data (paddy, rice, wheat, soybean), image pre-processing in MATLAB and assisting in the development of computational methods towards *automated grain quality assessment using imaging techniques.*
Supervisor: Amitava Das, Principal Scientist, Computational Instrumentation, CSIR-CSIO

Technology Skills

- **Scientific computing and scripting**: Python, MATLAB, C, Assembly
- **Deep learning frameworks**: TensorFlow (Keras), PyTorch
- **Web technologies**: Git/ GitHub/ Gitea, Django, Apache, Jupyter
- **Basic system administration**: Linux (Gentoo, Debian, Ubuntu, Raspbian, Proxmox, Kali), Windows 11/10/8.1/7/Vista/XP/98

- **Simulation & CAD**: MATLAB & Python (TensorFlow, PyTorch) for Signal Processing algorithms, modeling of filter banks, neural networks, deep learning; LTSpice for circuit simulation; SolidWorks, ANSYS, COMSOL and FreeCAD for modeling and analysis 3D structures
- **Other libraries**: Machine Learning: *Scikit-Learn*. Data modeling & visualisation: *Numpy, Pandas, Scipy, matplotlib, seaborn*. Cognitive and Neuroscientific experiments: *expyriment*. Image Processing: *OpenCV, PIL*. Web scraping: *requests, BeautifulSoup, robobrowser, selenium*. AI-Voice Automation: *OpenAssistant*. DBMS: *mysql.connector, shelve, anydbm, pickle*. Webapp: *Flask*. Mobile application: *Kivy*.
- **Automation with sensors and actuators**: Raspberry Pi, Arduino, 8051 microcontroller
- **Favourite subjects**: Signals and Systems, Digital Signal Processing, Wavelets and Filter Banks, Linear Algebra, Machine/ Deep Learning, Sensors and Transducers, Microprocessors and Microcontrollers, Computational Methods

Biographical

- **DOB**: April 1, 1990
- **Citizenship**: Indian/ भारतीय
- **Language Proficiency**: English, বাংলা (মাতৃভাষা), हिंदी
- **Hobbies**: Playing video games; listening stories (mythology, history); travelling to holy places.