Kishore Kumar Tarafdar

नमस्कार

किशोर कुमार तरफदार

Email | Homepage | Github

PM Research Fellow, EE, IIT Bombay, Powai, Mumbai 400 076, Maharashtra, India 🇮🇳

Vision

To gain deeper insights into physical phenomena using a computational problem-solving approach for crafting sustainable intelligent systems that would create a positive impact on society.

Education

Prime Minister's Research Fellow at the Department of Electrical Engineering
Jan 2021 to Present

Indian Institute of Technology Bombay
Powai, Mumbai, Maharashtra, India

Research group: Electronic Systems

Thesis topic: Multiresolution methods in machine learning systems

Ph.D. Supervisor: Prof. Vikram M. Gadre, Dept. of Electrical Engineering, IIT Bombay

Coursework CPI : 8.79/10

Award and Honor: Prime Minister's Research Fellowship (PMRF)

Master of Technology
July 2017 - June 2019

National Institute of Technology Rourkela
Rourkela, Odisha, India

Major: Biomedical Engineering   CGPA: 8.5/10 *[Gradecard]*

Thesis: 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 10.1016/j.compbiomed.2019.103526

Supervisor: Prof. Kunal Pal, Dept. of Biotechnology and Medical Engineering. NIT Rourkela

Co-supervisor: Dr. Anwesha Khasnobish, Scientist, TCS Research and Innovation, Kolkata

Lab: Medical Electronics and Instrumentation Laboratory

Award and Honor: Graduate Aptitude Test in Engineering (GATE) scholarship

Bachelor of Technology
Aug 2009 - May 2013

Bankura Unnayani Institute of Engineering (West Bengal University of Technology)
Bankura, West Bengal, India

Major: Electronics and Instrumentation Engineering   CGPA: 7.27/10 *[Gradecard]*

Major Project: Prototype of an automatic sun tracking system to capture direct sun rays for optimum capture of solar energy

Indian School Certificate (YEAR-12)
2008

Stepping Stone Model School
Alipurduar, West Bengal, India

Subjects: English, Mathematics, Physics, Chemistry, Computer Science, Environmental Education, Bengali

Percentage: 68% (Best of 4 subjects with English compulsory)   *[Pass Certificate]*

Indian Certificate of Secondary Education
2006

Stepping Stone Model School
Alipurduar, West Bengal, India

Subjects: English, Mathematics, Science, Computer Applications, History Civics & Geography, Bengali

Percentage: 71% (Best of 5 subjects with English compulsory)   *[Pass Certificate]*

Technology Skills

- **Scripting**: Python, MATLAB, C, Assembly
- **Deep learning frameworks**: TensorFlow (Keras), PyTorch
- **Web and other technologies**: Git/ GitHub, Django, Apache, Anaconda, Jupyter
- **Operating system**: LINUX (Gentoo, Debian, Ubuntu, Raspbian, Kali), Windows 11/10/8.1/7/Vista/XP/98
- **Simulation & CAD**: MATLAB & Python for Digital Signal Processing and modelling of filter banks, neural networks; SolidWorks, ANSYS, COMSOL and FreeCAD for modelling 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 & hardware**: 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

Industry Work/ R&D Experience/ Apprenticeship Prior Post Graduation

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

On duty from the start of the project until commissioning.
Job location: Assam, India
site #1*: Indian Oil Corporation Limited, Betkuchi Terminal, NEISO*
site #2*: Indian Oil Corporation Limited, Lumding Terminal, NEISO*

- **Civil Engineering Works**:
  Construction of Control Room (15m x 8m x 5m) with false flooring, false ceiling and electrification at *site #1* and *site #2*

- **Terminal Automation Works**:
  Installation, Testing and Commissioning of Tank Farm Management System (TFMS), Safety Integrated System, Integration of MOV, DBBV & ROSOVs, Erection and Commissioning of Power and Process ESD systems at *site #1* and *site #2*

Lead Design Engineer (Transformer Workshop) *[Experience Letter]*   *October 2014 - June 2015*
<u>Maffick Instruments Private Limited</u>   *Ambala, India*
Successful R&D and commercialization of a product.

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

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

- **R&D work**: 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

Teaching Assistantship (TA)

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

External TA:
1. NPTEL: Foundations of Wavelets and Multirate Digital Signal Processing (Spring semester 2024)
2. Mentorship of undergraduate research interns of Sardar Patel Institute of Technology, Mumbai (Spring semester 2024)
3. NPTEL: Foundations of Wavelets and Multirate Digital Signal Processing (Spring semester 2023)
4. Mentorship of undergraduate research interns of Sardar Patel Institute of Technology, Mumbai (Spring semester 2023)

Publications

1. *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.

2. *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.

3. *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.

4. *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.

5. *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.

6. *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.

7. *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.

8. *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.

Biographical

- **DOB**: 01-April-1990
- **Citizenship** : Indian/ भारतीय
- **Language Proficiency** : English, বাংলা (মাতৃভাষা), हिंदी
- **Hobbies**: Video games, travelling to holy places.

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01-01-2024 💻