Piyush Mishra piyush.mishra@univ-amu.fr

Ph.D Student, Applied CS

Experience in Research / Engineering / Development

Experience

2023 - 26	PhD, CS / Maths	Fresnel Inst., Maths Inst. of Marseille, Aix-Marseille Univ.
2023 (6 mon)	Research Intern	Maths Inst. of Marseille
2022 (3 mon)	Research Intern	Stony Brook Univ., NY
2021 (6 mon)	Framework Dev. Intern	Quantiphi, Mumbai
2019 (3 mon)	Research Intern	IIT Patna
2019 (6 mon)	Research Intern	Calcutta Univ.

Skills

1. **Development of data structures and algorithms**
   a. Introduced an attention-Bayesian hybrid framework for multiple particle tracking [1]
   b. Designed a multi-omics gene clustering algorithm [7]
2. **Cross-disciplinary adaptation**
   a. Theorised a proof-of-concept for a vanilla transformer architecture in the context of multiple particle tracking [2]
   b. Prototyped a classifier mechanism to understand large-window context in human DNA sequences [4]
   c. Coupled neural network approaches with heuristic optimisation strategies for image classification [5]
   d. Developed framework to optimise network structures using soft-computing approaches [6]
3. **Sustainable AI and low energy models**
   a. Built an attention-based interpretable particle tracking strategy [1]
   b. Found empirical results demonstrating compute efficiency of conventional particle tracking approaches compared with the transformer architecture [2, 3]
   c. Tested simulations for minimising energy expenditure in sensor networks [6]
   d. Participated in science popularisation events for AI risks and biases

Education

- PhD, CS / Maths, Aix-Marseille University — 2023 - 2026
- MS, Computational and Mathematical Biology (18.13 / 20) — 2021 - 2023
- B.Tech, Computer Science and Engineering (8.51 / 10) — 2017 - 2021

Publications and Archived Work

1. Mishra & Roudot; Attention Bayesian Hybrid Approach to Modular Multiple Particle Tracking, (Under Review), 2025
2. Mishra & Roudot; Comparative study of transformer robustness for multiple particle tracking without clutter, EUSIPCO, 2024
3. Mishra; Comparative Study of stochastic filtering and attention based approaches for intracellular dynamics estimation, I2M, 2023
4. Mishra; Understanding the human genome language with natural language models, SUNY, 2022
5. Mishra et al; Disease diagnosis in grapevines–a hybrid resnet-jaya approach
6. Mishra et al; Minimised jaya algorithm based structure optimisation for heterogeneous WSNs, ICCCS, 2020
7. Dutta et al; Incomplete multi-view gene clustering with data regeneration using shape boltzmann machine, Computers in Biology and Medicine, 2020
8. Mishra et al; Human activity recognition using deep neural network, ICDSE, 2019