Paramita Koley

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Education

Post Doctorate Fellow — *ISI Kolkata*
***Mentor**: Prof. Malay Bhattacharya* — *March 2024 - Present*
SERB National Post-Doctorate Fellow

Post Doctorate Fellow — *AI4ICPS Hub Foundation (IIT Kharagpur)*
***Advisor**: Prof. Niloy Ganguly.* — *January 2024 - March 2024*
Chanakya Post-Doctorate Fellow

Doctor of Philosophy — *Indian Institute of Technology, Kharagpur*
Computer Science — *July 2018 - February 2024*
***Supervisor**: Prof. Niloy Ganguly and Prof. Sourangshu Bhattacharya.*
***Thesis title**: Robust learning in asynchronous event data and multi-agent team competition.*

Master of Engineering — *Indian Institute of Science, Bangalore*
Computer Science — *2011 - 2013*
Grade: 6.4/8

Bachelor of Engineering — *IIEST, Shibpur*
Information Technology — *2006 - 2010*
Percentage: 76.6%

Higher Secondary — *Tarakeswar Mahavidyalaya*
WBBHSE — *2004 - 2006*
Percentage: 95.1%

Research interests

My primary area of research revolves around addressing diverse challenges related to **temporal sequence modeling** in various configurations. In graduation, I concentrated on **robust learning of temporal sequence** against different data artifacts using temporal point process framework. Currently, my research delves into a broader spectrum of issues within temporal sequence modeling.

Specifically, I am working on the **integration of temporal point process-based models with dynamic graph algorithms** for various real-world networks. In this line, my projects involve temporal knowledge graph completion problems and delay prediction in the railway network. My other works involve modeling the impact of **external stimuli on human behavior** using temporal event data and **temporal sequence generation with diffusion models**.

My another research interest involves designing **energy-efficient large language model inference**. Furthermore, during my graduation, I investigated various learning challenges in **multi-agent team competitions**, utilizing tools from the reinforcement learning framework.

Peer Reviewed Conference/Journal Publications

- **Brevity is the soul of sustainability: Characterizing LLM response lengths** Soham Poddar, Paramita Koley, Janardan Misra, Niloy Ganguly, Saptarshi Ghosh. ACL 2025 (Findings).

- **Towards Sustainable NLP: Insights from Benchmarking Inference Energy in Large Language Models.** Soham Poddar, Paramita Koley, Janardan Misra, Niloy Ganguly, Saptarshi Ghosh. NAACL 2025.
- **ExPERT: Modeling Human Behavior under External Stimuli Aware Personalized MTPP.** Subhendu Khatuya, Ritwik Vij, Paramita Koley, Samik Dutta, and Niloy Ganguly. AAAI 2025.
- **Differentiable Change-point detection in temporal point process.** Paramita Koley, Harshavardhan Alimi, Shrey Singla, Sourangshu Bhattacharya, Niloy Ganguly, Abir De. AISTATS 2023.
- **Offsetting Unequal Competition Through RL-Assisted Incentive Schemes.** Paramita Koley, Aurghya Maiti, Sourangshu Bhattacharya, and Niloy Ganguly. IEEE Transactions on Computational Social Systems (2022).
- **Demarcating Endogenous and Exogenous Opinion Dynamics: An Experimental Design Approach.** Paramita Koley, Avirup Saha, Sourangshu Bhattacharya, Niloy Ganguly, Abir De. ACM Trans. Knowl. Discov. Data 15(6): 99:1-99:25 (2021)
- **Regression under Human Assistance.** Abir De, Paramita Koley, Niloy Ganguly, Manuel Gomez-Rodriguez. AAAI 2020.
- **Generative Maximum Entropy Learning for Multiclass Classification.** Ambedkar Dukkipati, Gaurav Pandey, Debarghya Ghoshdastidar, Paramita Koley, D. M. V. Satya Sriram. ICDM 2013.

Research experience

SRIC, IIT Kharagpur *Kharagpur*
Project Scientist under Prof. Pawan Goyal *August - Dec 2023*

- Worked on designing algorithms for modeling temporal point process.

MPI-SWS *Kaiserslautern, Germany*
Internship under Prof. Manuel Gomez Rodriguez *May - July 2019*

- Worked on designing algorithms for human-assisted machine learning in linear regression.

Teaching experience

Introduction to computing *MIU, ISI Kolkata*
Fall 2024-2025

- This is an undergraduate course for 1st year BSDS students.

Ongoing Sponsored Projects

Temporal Modeling for Continuous Time Dynamic Graphs *MIU, ISI Kolkata*
Sponsored by SERB *Budget 30 Lakh*
Addresses the problem of integration of temporal point process-based models with dynamic graph algorithms for various real-world networks. Specifically, I am working on temporal knowledge graph completion problems and delay prediction in the railway network.

Projects

Modeling human-behavior under external stimuli
During PostDoc

Addressed the problem of modeling human behavior under various external stimuli by modifying the attention mechanism in the attention-based neural temporal point process (TPP) framework. Real-life examples include customer behavior under coupons, student behavior before the deadline, etc.

Demarcating exogenous events from networked event dynamics
During PhD
Addressed the problem of demarcating externally stimulated events from event stream generated in a network where events are modeled via temporal point process framework and demarcation is performed via subset selection of submodular functions.

Change-point detection in temporal event data
During PhD
Addressed change-point detection problem for continuous-time event data in temporal point process framework, where the model parameters are selected by solving a bi-level optimization framework.

Offsetting bias in unequal competition via incentives
During PhD
Addressed the problem of offsetting bias in unequal competition, where inequality stems from agents with different skill levels. In particular, we analyze a bunch of incentive schemes for this purpose using a multi-agent reinforcement learning framework.

Academic achievements

- Recipient of SERB National Post Doctoral Fellowship at Machine Intelligence Unit, ISI Kolkata.
- Recipient of Chanakya Post Doctoral Fellowship
- Served as program committee member of the following conferences: WSDM 2025, CODS-COMAD 2024, WSDM 2024, AISTATS 2023, AAAI 2022
- Secured rank 8 in GATE (CS) 2011.
- Secured rank 17 in West Bengal Higher Secondary examination by securing 95% marks.

Technical abilities

Course TA	Machine Learning, Programming and Data Structure, Information Retreival
Relevant courses	Machine Learning, Graphical Models, Information Retrieval, Scalable Data Mining, Optimization, Algorithms and Data Structures
Programming Languages/Tools	Python, C, MATLAB.
Toolboxes/Frameworks	Pytorch, Scikit-learn, Pandas, numpy, nltk, tick.

Language proficiencies

- English, Bengali