SUBHOJYOTI MUKHERJEE

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Research Interests Active learning, Reinforcement Learning, Online Learning, Multi-armed bandits, Deep Active learning with LLMs, RLHF.

Education

University of Wisconsin-Madison, Madison, USA — Fall 2019 – current
Ph.D., Electrical & Computer Engineering
Adviser: Dr. Robert Nowak and Dr. Josiah Hanna

University of Wisconsin-Madison, Madison, USA — Fall 2019 – 2021
M.S, Electrical Engineering
Adviser: Dr. Robert Nowak

Indian Institute of Technology Madras, India — 2015–2018
M.S (Research), Computer Science
Advisers: Dr. Balaraman Ravindran and Dr. Nandan Sudarsanam

West Bengal University of Technology, Kolkata, India — 2009–2013
Bachelor of Technology, Computer Science & Engineering

Publications

1. **Subhojyoti Mukherjee**, Qiaomin Xie, Josiah Hanna, Robert Nowak, *"Multi-task Representation Learning for Pure Exploration in Bilinear Bandits"*, Neural Information Processing Systems **(Neurips 2023)** [Paper]
2. **Subhojyoti Mukherjee**, Josiah Hanna, Robert Nowak, *"ReVar: Strengthening Policy Evaluation via Reduced Variance Sampling"*. Uncertainty in Artificial Intelligence **(UAI-22)**. [Paper]
3. **Subhojyoti Mukherjee**, *"Safety Aware Changepoint Detection for Piecewise i.i.d. Bandits"*. Uncertainty in Artificial Intelligence **(UAI-22)**.[Paper]
4. **Subhojyoti Mukherjee***, Ardhendu Tripathy*, Robert Nowak, *"Chernoff Sampling for Active Testing and Extension to Active Regression"*. The 25th International Conference on Artificial Intelligence and Statistics **(AISTATS-22)**. [Paper]
5. Blake Mason, Romain Camilleri, **Subhojyoti Mukherjee**, Kevin Jamieson, Robert Nowak, Lalit Jain, *"Nearly Optimal Algorithms for Level Set Estimation"*. The 25th International Conference on Artificial Intelligence and Statistics **(AISTATS-22)**. [Paper]
6. Samarth Gupta, Shreyas Chaudhari, **Subhojyoti Mukherjee**, Gauri Joshi, Osman Yagan, "*A Unified Approach to Translate Classical Bandit Algorithms to the Structured Bandit Setting*", *IEEE International Conference on Acoustics, Speech and Signal Processing **(ICASSP-21)***. [Paper]
7. **Subhojyoti Mukherjee**, Ardhendu Tripathy, and Robert Nowak, "*Generalized Chernoff Sampling: A New Perspective on Structured Bandit Algorithms*", *Thirty-seventh International Conference on Machine Learning **(ICML-21)***, Workshop on Theoretical Foundations of Reinforcement Learning [Poster]. [Paper]

8. Samarth Gupta, Shreyas Chaudhari, **Subhojyoti Mukherjee**, Gauri Joshi, Osman Yagan, "*A Unified Approach to Translate Classical Bandit Algorithms to the Structured Bandit Setting*", *IEEE Journal on Selected Areas in Information Theory **(2020)***. [Paper]
9. **Subhojyoti Mukherjee**, and Odalric-Ambrym-Maillard, "*Distribution-dependent and Time-uniform Bounds for Piecewise i.i.d Bandits*", *Thirty-sixth International Conference on Machine Learning **(ICML-19)***, Workshop on Reinforcement Learning for Real Life 2019 track [Poster]. [Paper]
10. **Subhojyoti Mukherjee**, K.P. Naveen, Nandan Sudarsanam, and Balaraman Ravindran, "*Efficient UCBV: An Almost Optimal Algorithm using Variance Estimates*", *Proceedings of the Thirty-Second Association for the Advancement of Artificial Intelligence **(AAAI-18)***, main conference track [Oral].[Paper]
11. **Subhojyoti Mukherjee**, K.P. Naveen, Nandan Sudarsanam, and Balaraman Ravindran, "*Thresholding Bandits with Augmented UCB*", *Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence **(IJCAI-17)***, main conference track [Oral + Poster]. [Paper]

Preprints

1. **Subhojyoti Mukherjee**, Qiaomin Xie, Josiah Hanna, Robert Nowak, *"SPEED: Optimal Experimental Design for Policy Evaluation in Linear Heteroscedastic Bandits"*. [Paper] AISTATS 2023 (Submitted)
2. **Subhojyoti Mukherjee**, Ruihao Zhu, Branislav Kveton, *"Efficient and Interpretable Bandit Algorithms"*, [Paper] AISTATS 2023 (Submitted).
3. **Subhojyoti Mukherjee**, Josiah Hanna, Robert Nowak, *"SaVeR: Optimal Data Collection Strategy for Safe Policy Evaluation in Bandits"*.
4. **Subhojyoti Mukherjee**, Devin Conathan, Robert Nowak, *"AdaTune: Active Learning for Fine-Tuning BERT on QA Task"*

Research Internships

1. **Amazon AWS AI, San Jose, USA:** Fall 2023 (part-time), Host: Branislav Kveton, Yifei Ma, Anusha Lalitha, Kousha Kalantiri, Ge Liu, Aniket Deshmukh, Anoop Deoras. Working on RLHF with LLMs
2. **Amazon AWS AI, San Jose, USA:** Summer 2023, Host: Branislav Kveton, Yifei Ma, Anusha Lalitha, Ge Liu, Aniket Deshmukh, Anoop Deoras. Worked on Active In-Context Learning with LLMs
3. **CMU, ECE Dept., Pittsburgh, USA:** Summer 2019, Host: Gauri Joshi. Worked on Structured Bandits
4. **Adobe Research, San Jose, USA:** Spring 2018. Host: Branislav Kveton. Worked on Item recommendation with Ranking and Bandits
5. **INRIA, SequeL Lab, Lille, France:** Fall 2017, Host: Odalric Maillard. Worked on Non-stationary Bandits

Master's Thesis (EE, UW-Madison) **Active Sequential Hypothesis Testing with Extension to Active Regression and Multi-armed Bandits**

Master's Thesis (CS, IIT Madras) **Finite-time Analysis of Frequentist Strategies for Multi-armed Bandits**

Teaching Experience

Teaching Assistant, UW-Madison 2019–current
Matrix Methods in Machine Learning - Prof. Robert Nowak
Mathematical Foundation in Machine Learning - Prof. Robert Nowak
Teaching Assistant, UMass Amherst 2018–2019
Natural Language Processing - Prof. Mohit Iyyer
Design of Algorithms - Prof. Daniel Sheldon
Teaching Assistant, IIT Madras 2015–2018
Introduction to Programming - Prof. Raghavendra Rao B. V.
Reinforcement Learning(twice) - Prof. Balaraman Ravindran
Compiler Design - Prof. Rupesh Nasre

Professional Activities

Reviewer AISTATS, UAI, AAAI, ICML, ICLR, Neurips, TMLR.

Relevant Coursework [more information]

Introduction to Machine Learning	Reinforcement Learning
Natural Language Processing	Linear Algebra and Random Processes
Multi-variate Data Analysis	Real Analysis
Introduction to Learning Theory	Design and Analysis of Algorithms
Mathematical Foundations of ML	Theoretical Foundations of ML

Relevant Languages

C, C++, Java, Javascript, Python, PyTorch

Award Grants and Fellowship

1. Top reviewer award for UAI 2023, Neurips 2023
2. Student Scholarship for AAAI 2018, UAI 2022, Neurips 2023
3. UW-Madison nominee for Apple PhD fellowship and Two-sigma PhD fellowship, UW-Madison Chancellor's Opportunity Fellowship 2019-20, UW-Madison ECE Welcome Award of USD 3000.
4. IIT Madras student travel grant of USD 2300, Google travel grant of USD 1700, Microsoft travel grant of USD 1435 (declined).

Other Achievements

Ranked 1150/155190 candidates in Graduate Aptitude Test in Engineering **(GATE)** 2014.
Secured 98.93 percentile in Common Admission Test **(CAT)** 2014 among 196988 candidates.

References

Dr. Robert Nowak
Professor
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ECE Dept, UW-Madison

Dr. Josiah Hanna
Assistant Professor
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CS Dept, UW-Madison

Dr. Branislav Kveton
Principal Scientist
bkveton@amazon.com
Amazon's lab, Berkeley

Dr. Odalric Maillard
INRIA Researcher (CR1)
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SequeL Team, INRIA Lille, France

Dr. Balaraman Ravindran
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Dr. Nandan Sudarsanam
Assistant Professor
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DoMS, IIT Madras