

SREEJEET MAITY

Raleigh, North Carolina, U.S.A



EDUCATION

North Carolina State University

Ph.D. Electrical Engineering

Raleigh, NC, U.S.A

Aug 2023 - Present

Indian Institute of Science, Bangalore

M.Tech Robotics and Autonomous Systems

Bangalore, India

Aug 2021 - June 2023

Jadavpur University

B.E Electrical Engineering

Kolkata, India

Aug 2017 - July 2021

RESEARCH INTERESTS

My research develops provably robust reinforcement learning (RL) algorithms with finite-sample guarantees under uncertainty and adversarial corruption. I focus on corruption-tolerant distributed and federated RL, together with tight minimax lower bounds characterizing the fundamental limits of robust learning. My broader interests include violation-constrained RL under model uncertainty and robust LLM post-training through adaptive adversarial curricula and distributionally robust optimization.

• **Ph.D. Thesis:** TOWARDS A FINITE-TIME THEORY OF ADVERSARIALLY ROBUST REINFORCEMENT LEARNING: ALGORITHMS, GUARANTEES, AND FUNDAMENTAL LIMITS.

• **Anticipated Graduation Date:** *December 2027-March 2028.*

EXPERIENCE

North Carolina State University

Graduate Research/Teaching Assistant

Ph.D. Advisor: [Dr. Aritra Mitra](#).

Raleigh, NC, U.S.A

Aug 2023 - Present

■ Finding Robust Optimal Policy from Corrupted and Correlated Observations.

- Showed that vanilla Q -learning is provably fragile under state and reward corruption, and designed a robust variant that employs robust Bellman targets to achieve near-optimal performance.
- Established non-asymptotic, finite-time convergence, with tightness certified by a matching minimax lower bound. Extended these guarantees to the *asynchronous* setting under temporal dependence, relaxing strong distributional assumptions on reward statistics.

■ Robust Policy Evaluation under Adversarial Influences and Imperfect Markovian Data.

- Established the first finite-time theory for robust TD learning under time-correlated (Markovian) noise and function approximation: (i) proved divergence of vanilla TD under adaptive corruption; (ii) designed Robust-TD with clean-case rates up to a small additive bias; and (iii) derived a near-tight lower bound certifying inevitability of the corruption term.

■ Scalable Hybrid Algorithms for Multi-Agent Federated Learning under Adversaries.

- Developed adversarially robust, communication-efficient RL for federated multi-agent settings; introduced a novel hybrid model-free and model-based class of algorithms with finite-time guarantees.
- Extended to fully decentralized MARL with Byzantine tolerance and logarithmic communication, preserving collaborative speedups; and proved conditions under which the corruption bias diminishes with sample size.

University of California, San Diego

Collaborator: [Prof. Robert W. Heath Jr.](#)

Research Collaboration

San Diego, CA, U.S.A.

September 2025–Present

■ Decentralized Q-Learning with Asynchronous Sampling and Partial Coverage.

- Developing decentralized Q-learning algorithms that enable agents with partial state-action coverage to learn collaboratively from asynchronous data. Establishing finite-time convergence guarantees and quantifying the benefits of variance reduction over static and time-varying communication networks.

Columbia University, New York

Collaborator: [Prof. James Anderson](#).

Research Collaboration

New York, NY, U.S.A

May 2026 - Present

■ Byzantine-Robust Personalized Federated TD Learning with Shared Representations.

- Developing Byzantine-robust representation learning for heterogeneous RL agents interacting with heterogeneous MDPs and temporally dependent data. The framework combines a shared low-dimensional value-function representation with personalized local parameters while avoiding heterogeneity bias.

Theme 1. Provably Robust Reinforcement Learning: Algorithms and Statistical Limits

- (P1) *Sreejeet Maity, Aritra Mitra. Corruption-Tolerant Asynchronous Q-Learning with Near-Optimal Rates. [International Conference on Machine Learning \(ICML\)](#), 2026.*
- (P2) *Sreejeet Maity, Aritra Mitra. Robust Asynchronous Q-Learning under Reward and State Corruption via Batching. [IEEE Conference on Decision and Control \(CDC\)](#), 2026.*
- (P3) *Sreejeet Maity, Aritra Mitra. Adversarially-Robust TD-Learning with Markovian Data: Finite-Time Rates and Fundamental Limits. [International Conference on Artificial Intelligence and Statistics \(AISTATS\)](#), 2025.*
- (P4) *Sreejeet Maity, Aritra Mitra. Robust Q-Learning under Corrupted Rewards. [IEEE Conference on Decision and Control \(CDC\)](#), 2024.*
- (P5) *Sreejeet Maity, Aritra Mitra. Towards a Near-Optimal Finite-Time Theory of Robust Policy Evaluation under Corruption. Under review at [Learning for Dynamics and Control \(L4DC\)](#), 2027.*
- (P6) *Sreejeet Maity, Aritra Mitra. Towards Minimax-Optimal Asynchronous Q-Learning from Corrupted Markovian Data. Under review at [Automatica](#).*

Theme 2. Adversarially Robust Federated Reinforcement Learning with Collaborative Speedups

- (P7) *Sreejeet Maity, Aritra Mitra. Robust Federated Q-Learning with Almost No Communication. [American Control Conference \(ACC\)](#), 2026.*
- (P8) *Sreejeet Maity, Aritra Mitra. Learning from Unreliable Trajectories: Adversarially-Robust Federated Q-Learning. Under review at [Journal of Machine Learning Research \(JMLR\)](#).*
- (P9) *Sreejeet Maity, Leonardo Felipe Toso, James Anderson, Aritra Mitra. Value Function Representation for Adversarially Robust Federated TD Learning. Under review at [Transactions on Machine Learning Research \(TMLR\)](#).*

Theme 3. Decentralized Reinforcement Learning over Static and Time-Varying Networks

- (P10) *Sreejeet Maity, Feng Zhu, Robert W. Heath Jr., Aritra Mitra. Variance-Reduced Q-Learning over Static and Time-Varying Networks. [American Control Conference \(ACC\)](#), 2026.*
- (P11) *Sreejeet Maity, Feng Zhu, Robert W. Heath Jr., Aritra Mitra. Decentralized Q-Learning with Asynchronous Sampling and Partial Coverage. Under review at [IEEE Transactions on Signal Processing \(TSP\)](#).*

Theme 4. Communication Constraints and Sparse Model Changes in Reinforcement Learning

- (P12) *Sreejeet Maity, Aritra Mitra. Adaptive Quantization Preserves Fast Rates in TD-Learning over Rate Limited Channels. Under review at [European Control Conference \(ECC\)](#), 2027.*
- (P13) *Sreejeet Maity, Leonardo Felipe Toso. Adaptive History Selection for Reinforcement Learning under Sparse Model Changes. Under review at [European Control Conference \(ECC\)](#), 2027.*

WORKSHOP AND SYMPOSIUM PRESENTATIONS

- (W1) *Learning When the Data Lies: Promise and Fundamental Limits. [Applied AI Symposium](#), 2026.*
- (W2) *Multi-Agent Robust FRL with Sparse Communication. [NCSU Robotics Symposium](#), 2026.*
- (W3) *Corruption-Tolerant Agnostic Q-Learning. [NeurIPS Reliable ML Workshop](#), 2025.*
- (W4) *Robust Federated RL with Byzantine Agents. [Applied AI Symposium](#), 2025; [NESCW](#), 2026.*
- (W5) *Theoretical Limits of Robust TD Learning. [New York RL Workshop \(NYRL\)](#), 2025, Amazon.*
- (W6) *Finite-Time Theory for Robust RL. [Northeast Systems and Control Symposium \(NESCW\)](#), 2025.*
- (W7) *Adversarially-Robust Deep Q-Network for Algorithmic Trading. [MLSS](#), 2025, NCSU.*
- (W8) *Robust Algorithms for Adversarial Reinforcement Learning. [Applied AI Symposium](#), 2024.*

INVITED TALKS AND SEMINARS

- (IT1) *Towards Finite-Time Rates for Adversarially-Robust RL.* CORAL Seminar, NCSU. MARCH 2026
- (IT2) *Unreliable Collaboration at Scale: Near-Optimal Fed-RL.* CS Dept. Seminar, NCSU. OCTOBER 2026
- (IT3) *Learning When the Data Lies: Promise and Fundamental Limits.* Columbia University. JANUARY 2027

SOFTWARES

 **FEDERATED MARL-GYM:** We introduce a custom multi-agent reinforcement learning environment built with Gymnasium and Pygame, designed for evaluating federated RL (FRL) algorithms. The environment models a grid world where multiple agents navigate to accomplish spatially distributed tasks.

SKILLS

PROGRAMMING LANGUAGES: Python, MATLAB, Simulink, C++, R.

SOFTWARES AND LIBRARIES: Tensorflow, PyTorch, Scikit-learn, Numpy, Pandas, Gymnasium, MuJoCo.

MATHEMATICAL SKILLS: Linear Algebra, Probability Theory, Robust Statistics, Stochastic Approximation.

RESEARCH SKILLS: Reinforcement Learning, Statistical Learning Theory, Optimization, Control Theory.

RELEVANT COURSES

LEARNING THEORY: Theoretical Foundations of Large-Scale Machine Learning, Reinforcement Learning, Machine Learning for Signal Processing, Theory and Applications of Bayesian Learning, Physics Modelling with Neural Networks, Deep Learning and Neural Networks, Distributed Learning.

MATHEMATICS: Analysis, Probability and Stochastic Process, High-Dimensional Statistics, Stochastic Models and Applications, Convex Optimization for Data Science, Detection and Estimation Theory.

CONTROL THEORY: Safety-Critical Control of Robotic Systems, Dynamics of Linear Systems, Networked and Distributed Control, Formal Analysis for Control Theory.

ACADEMIC AND PROFESSIONAL SERVICES

TA DUTIES: Served as the Head Teaching Assistant for ECE 516: Systems and Control Engineering and ECE 308: Elements of Control Systems at the Department of Electrical and Computer Engineering, North Carolina State University, during the Spring and Fall of 2025.

PEER-REVIEWER: Served as a reviewer for leading conferences and journals, including the American Control Conference (ACC), the IEEE Conference on Decision and Control (CDC), Indian Control Conference (ICC), Learning for Dynamics and Control (L4DC), Annual Conference on Neural Information Processing Systems (NeurIPS), Artificial Intelligence and Statistics Conference (AISTATS), Transactions in Machine Learning Research (TMLR), IEEE Transactions in Automatic Control (TAC), Transactions on Control Systems Technology (TCST), Transactions in Signal and Information Processing over Networks (TSIPN).

SELECTED AWARDS AND HONORS

ACC 2026 Travel Award	2026
L4DC 2025 Student Support Grant	2025
NESCW 2025 Student Support Grant	2025
IEEE CDC 2024 Student Support Award	2024
NC State ECE Student Research Support Award	2024
College of Engineering Graduate Merit Award	2023,2024

REFERENCES

- **Dr. Aritra Mitra** (*Ph.D. Advisor and Chair of Advisory Committee*)
Assistant Professor, Department of Electrical and Computer Engineering.
NORTH CAROLINA STATE UNIVERSITY, RALEIGH.
Email: amitra2@ncsu.edu
- **Dr. James Anderson** (*Committee Member and Research Collaborator*)
Associate Professor, Department of Electrical Engineering.
COLUMBIA UNIVERSITY, NEW YORK.
Email: ja3451@columbia.edu
- **Dr. Robert W. Heath Jr.** (*Research Collaborator*)
Charles Lee Powell Chair in Wireless Communications, Electrical and Computer Engineering.
UNIVERSITY OF CALIFORNIA, SAN DIEGO.
Email: rwheathjr@ucsd.edu