

# MILIND NAKUL

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## Education

### Georgia Institute of Technology

2023 - 2028 (Expected)

*Ph.D. in Machine Learning with Minor in Mathematics | GPA: 3.85/4.0*

*Advisors:* Prof. Ashwin Pananjady & Prof. Vidya Muthukumar, *Research:* Statistics, Reinforcement Learning

### Indian Institute of Technology Kanpur

2018 - 2023

*Bachelor and Master of Technology in Electrical Engineering | GPA: 9.6/10*

*Thesis:* SGD-based algorithms for imitation learning, *Minor:* Machine learning and applications

## Awards and Fellowships

- **John Morris Fellowship** by H. Milton Stewart School of Industrial & Systems Engineering. 2023-24
- **Dr. Prateek Mishra Memorial Gold Medal** by IIT Kanpur. 2023
- **Academic Excellence Award** (equivalent to Dean's List) by IIT Kanpur . 2018-22

## Publications/Preprints

- **Nakul, M.**, Muthukumar, V. and Pananjady, A. "Estimating stationary mass, frequency by frequency", *Conference on Learning Theory (COLT)*, 2025. (arXiv)
- **Nakul, M.**, Li, T., Pananjady, A., "Multiscale Replay: A Robust Algorithm for Stochastic Variational Inequalities with a Markovian Buffer." (In preparation)
- **Nakul M.**, Rajoriya A. and Budhiraja R., "Variational Learning Algorithms For Channel Estimation in RIS-assisted mmWave Systems.", *IEEE Transactions on Communications*, 2023. (IEEE Link)

## Experience

### Research Assistant

Georgia Tech, Atlanta, US

*High-dimensional statics and reinforcement learning*

Jan '24 - Present

- Developed a multi-scale replay algorithm to solve the policy evaluation problem in RL without mixing information.
- Demonstrated how "experience replay" from RL can be applied in a statistically efficient manner with dependent data.

*Distribution Estimation from dependent data*

Sept '24 - Present

- Proposed a new estimator, implementable in linear time, for the stationary distribution of dependent data.
- It has wide ranging applications from ecology, natural language modeling to quantifying hallucinations in LLMs.

### Graduate Research Assistant

SPiN Labs, IIT Kanpur, India

*Stochastic Gradient based algorithms for imitation learning*

May '22 - Apr '23

- Implemented algorithms such as DAGGER, SMILe, and forward training on various environments of OpenAI Gym.
- Worked on developing a SGD based imitation learning algorithm for reducing the number of calls made to the expert.

### Undergraduate Research Assistant

IWiN Labs, IIT Kanpur, India

*Variational Inference for CE in reconfigurable intelligent surface (RIS) systems*

Jan '22 - Oct '22

- Developed an algorithm based on variational expectation maximization for channel estimation in RIS wireless systems.
- Proposed algorithm achieves better NMSE and spectral efficiency, making RIS-aided systems implementable in practice.

### Software Engineering Intern

Cisco Systems, Bangalore, India

*Automation Intent for Cisco Multicast Routers*

May '21 - Jul '21

- Developed custom tool to parse command outputs and extract field descriptions from the routing table using **regex**.
- Integrated python project into Automation Framework platform used at Cisco as a unit test automation template.

## Technical Skills

- **Programming:** Python, C, C++, MATLAB, Octave, Java
- **Machine Learning Tools:** PyTorch, Tensorflow, Numpy, Pandas, ChainerRL

## Relevant Coursework

- Data Structures
- Algorithms Analysis
- Online decision making
- Machine Learning
- Stochastic Processes
- Statistics
- Probability
- Sampling