Haque Ishfaq

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		Google Scholar Profile Link

Research Interests

Reinforcement learning theory, bandits, high dimensional statistics, optimizations.

Education

Montreal Institute for Learning Algorithms (MILA) & McGill University

Ph.D. Student, Computer Science (September 2018 - January 2025 (Expected))

- Research Topic: Exploration-exploitation trade-offs with provable guarantees in bandits and reinforcement learning.
- Advisor: Prof. Doina Precup

Simons Institute, University of California Berkeley

Visiting Graduate Student, Theory of Reinforcement Learning Program, Fall 2020

Stanford University

M.S. Statistics, June 2018
B.S. in Mathematical and Computational Science, June 2015

- McCaw Scholar (2011–2015), four-year academic scholarship for international students (USD 226,000).

Honors and Awards

2022-2023	FRQNT Doctoral Scholarship (CAD 28,000)
2021–2022	Graduate Excellence Fellowship, McGill University (CAD 5000)
2020–2021	Graduate Excellence Fellowship, McGill University (CAD 13,500)
2019–2020	DeepMind Graduate Award (CAD 40,000)
2018–2019	Graduate Excellence Fellowship, McGill University (CAD 12,000)
2014	Undergraduate Research and Advising Grant, Stanford University (USD 1000)
2014	Social Impact Grant, Stanford Haas Center for Public Service (USD 1000) - 1 of 2 recipients of the grant in the entire university.
2013	CS Undergraduate Research Experience (CURIS) Grant, Stanford University (USD 6000)
2012	EE Research Experience for Undergraduates (REU) Grant, Stanford University (USD 6600)
2011–2015	Craig and Susan McCaw Scholarship for International Students, Stanford University (USD 226,000) - Full funding for 4 years at Stanford University
2010	Honorable Mention, International Mathematical Olympiad, Kazakhstan
2009	Honorable Mention, International Mathematical Olympiad, Germany
2008	Participant, International Mathematical Olympiad, Spain
2009, 2010	1st Runner-up, Bangladesh Mathematical Olympiad
2006–2008	Champion, Bangladesh Mathematical Olympiad
2008	10th in Secondary School Certificate (SSC) examination among ~300,000 students, Dhaka Education Board, Bangladesh

PUBLICATION **Ishfaq, H.**, Nguyen-Tang, T., Feng, S., Arora, R., Wang, M., Yin, M., Precup, D. 2024. *Offline Multitask Representation Learning for Reinforcement Learning.* Conference on Neural Information Processing Systems (NeurIPS) 2024.

Ishfaq, H., Tan, Y., Yang, Y., Lan, Q., Lu, J., Mahmood, R., Precup, D., Xu, P. *More Efficient Randomized Exploration for Reinforcement Learning via Approximate Sampling.* Reinforcement Learning Conference (RLC) 2024.

Ishfaq, H., Lan, Q., Xu, P., Mahmood, R., Precup, D., Anandkumar, A., Azizzadenesheli, K. *Provable and Practical: Efficient Exploration in Reinforcement Learning via Langevin Monte Carlo.* International Conference on Learning Representations (ICLR) 2024.

Ishfaq, H., Cui, Q., Nguyen, V., Ayoub, A., Yang, Z., Wang, Z., Precup, D., Yang, L. *Randomized Exploration for Reinforcement Learning with General Value Function Approximation .* International Conference on Machine Learning (ICML) 2021.

Ishfaq, H., Yang, Z., Lupu, A., Nguyen, V. ,Liu, M.,Islam, R. Precup, D.,Wang, Z. *Randomized Least Squares Policy Optimization.* Reinforcement Learning Theory Workshop at the International Conference on Machine Learning (ICML) 2021.

PREPRINT Fadnis, K., Talamadupula, K., Kapanipathi, P., **Ishfaq, H.**, Roukos, S., Fokoue, A. 2019. *Path-Based Contextualization of Knowledge Graphs for Textual Entailment .*

Ishfaq, H., Hoogi, A., Rubin, D. 2018. *TVAE: Triplet-Based Variational Autoencoder using Metric Learning.*

WORK
EXPERIENCE **Meta AI, Research Intern**, Menlo Park, CA (Jun.–Sept. 2022)
- Worked on contextual bandit algorithm applied to Ad. recommendation.

Microsoft, Applied Scientist Intern, Bellevue, WA (Jul.–Sept. 2021)
- Worked on improving search ranking in Outlook using contextual bandit.

IBM Research, Research Intern, Yorktown Heights, NY (Jul.–Oct. 2019)
- Worked on reinforcement learning algorithms applied to knowledge graph embedding and query answering problem.

NVIDIA, Applied Deep Learning Research Intern, Santa Clara (June–Sept. 2017)
- Worked on optical flow and video frame prediction problem under Bryan Catanzaro.
- Designed and implemented recurrent autoencoder with temporal skip connections consisting of Convolutional LSTM module within it.

Quantitative Imaging Lab, Research Assistant, Stanford, California (April–Dec. 2017)
- Worked on deep learning methods for biomedical image analysis under Prof. Daniel Rubin.
- Designed and implemented deep network incorporating Variational Autoencoder and Triplet Network to learn semantic visual representation of medical image data.

Mobilize Center, Research Assistant, Stanford, California (Sept.–Dec. 2016)
- Worked on accelerometer generated temporal data classification for activity recognition using data programming and weak supervision based approaches.
- Designed heuristic labeling functions to label unlabeled data in a weakly supervised manner using data programming (Snorkel) paradigm developed by Chris Re group

at Stanford CS department.

Silicon Studio, Data Science Intern, Tokyo, Japan (July–Sept. 2016)
- Designed and implemented machine learning algorithm to forecast and simulate individual player behavior in mobile games.
- Used LSTM Recurrent Neural Network and ARIMA based models for player behavior forecasting.

Verizon Labs, Data Science Intern, Palo Alto, California (June–Sept. 2015)
- Worked on Ad targeting using clickstream data.
- Designed and implemented machine learning and statistical model that would allow Verizon to grow their Ad targeting to non-opt-out customers by 7.4X.

Salzman Lab, Research Assistant, Stanford School of Medicine (June–Aug. 2014)
- Using R, performed correlation analysis of expression level of different circular RNAs between human and mouse samples.
- Used molecular biology technology (qPCR, RNA extraction) to study circular RNA.

Guibas Lab, Summer Research Program, Stanford School of Medicine (June–Aug. 2013)
- Studied mathematical theory behind 3D Kinetic Alpha Complex and its application in design of algorithm for constructing cell complex in space-time.
- Studied computational geometry and topology as part of the project.

TALKS &
PRESENTATIONS

Provable and Practical: Efficient Exploration in Reinforcement Learning via Langevin Monte Carlo, 25th International Symposium on Mathematical Programming, Montreal, Canada. (July 2024)

Bridging Theory and Practice: Efficient Exploration in Reinforcement Learning via Langevin Monte Carlo, Microsoft Research, Seattle, USA. (July 2024)

Provable and Practical: Efficient Exploration in Reinforcement Learning via Langevin Monte Carlo, Two Sigma PhD Symposium, New York, USA. (June 2024)

Provable and Practical: Efficient Exploration in Reinforcement Learning via Langevin Monte Carlo, Citadel PhD Summit, Miami, USA. (April 2023)

Randomized Exploration for Reinforcement Learning with General Value Function Approximation, ML-Seminar, Purdue University, USA. Host: Kamyar Azizzadenesheli (September 2021)

Randomized Exploration for Reinforcement Learning with General Value Function Approximation, University of California, Berkeley, USA. Host: Jiantao Jiao (September 2021)

Provably Efficient Policy Optimization with Thompson Sampling, Stanford University, USA. Host: Benjamin Van Roy (Feb 2021)

Provably Efficient Policy Optimization with Thompson Sampling, Microsoft Research Reinforcement Learning Day. (Jan 2021)

Provably Efficient Policy Optimization with Thompson Sampling, Northeast Reinforcement Learning and Decision Making Symposium. (Nov 2020)

TVAE: Deep Metric Learning Approach for Variational Autoencoder, Visual Intelligence for Transportation (VITA) Lab, EPFL, Switzerland. Host: Alexandre Alahi (March 2018)

SERVICE & LEADERSHIP	Organizer: Reinforcement Learning Ready for Production Workshop, AAAI 2023
	Reviewer: ICML 2023-2024, NeurIPS 2023, EWRL 2023, ICLR 2024

GRADUATE COURSEWORK

❏ Machine Learning
❏ Statistical Inference
❏ Stochastic Processes
❏ Regression Analysis
❏ Convex Optimization
❏ Linear Dynamical Systems

❏ Statistical Learning Theory
❏ Linear and Nonlinear Optimization
❏ CNN for Visual Recognition
❏ NLP with Deep Learning
❏ Reinforcement Learning
❏ Social Network Analysis

MATHEMATICS COURSEWORK

❏ Real Analysis
❏ Partial Differential Equations
❏ Linear Algebra Theory
❏ Number Theory

❏ Matrix Algebra
❏ Combinatorics and Graph Theory
❏ Algebra I (Group Theory)
❏ Functional Analysis (Audited)

PROGRAMMING   Python, PyTorch, R, SQL, Julia, Matlab, C/C++.

LANGUAGES   English (Fluent), Bengali (Native).