Haque Ishfaq

Contact Information

Department of Computer Science
McConnell Engineering Building
McGill University
3480 Rue University
Montreal, QC H3A 0E9 Canada

(438) 408-3928
haque.ishfaq@mail.mcgill.ca
https://hmishfaq.github.io/

Research Interests

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

Education

Montreal Institute for Learning Algorithms (MILA) & McGill University

Ph.D. Student, Computer Science (September 2018 - Present)

- 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

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	10^{th} in Secondary School Certificate (SSC) examination among $\sim$300,000 students, Dhaka Education Board, Bangladesh

PUBLICATION

Ishfaq, H., Yang, Z., Lupu, A., Nguyen, V. ,Liu, M.,Islam, R. Precup, D.,Wang, Z. *Provably Efficient Policy Optimization via Thompson Sampling.* Deep Reinforcement Learning Workshop at NeurIPS 2020, presented at the BayLearn 2020 Workshop.

PREPRINT

Fadnis, K., Talamadupula, K., Kapanipathi, P., **Ishfaq, H.**, Roukos, S., Fokoue, A. 2019. *Path-Based Contextualization of Knowledge Graphs for Textual Entailment .* arXiv preprint arXiv:1911.02085.

WORK EXPERIENCE

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.

PRESENTATION

Ishfaq, H., Liu, R. (2017, June). *TVAE: Deep Metric Learning Approach for Vari-*

ational Autoencoder. Presentation delivered at CS 231N Final Presentation Session, Stanford, CA.

Ishfaq, H., Liu, R. (2017, June). *TVAE: Deep Metric Learning Approach for Variational Autoencoder*. Presentation delivered at CS 231N Final Presentation Session, Stanford, CA.

Yang, C.*, **Ishfaq, H.*** (2017, March). *Question Answering on SQuAD using Coattention Mechanism and Highway Network*. Poster presented at CS 224N Final Project Poster Session, Stanford, CA.

Yang, C.*, **Ishfaq, H.*** (2017, March). *Question Answering on SQuAD using Coattention Mechanism and Highway Network*. Poster presented at CS 224N Final Project Poster Session, Stanford, CA.

Ishfaq, H. (2016, December). *Segmenting Triaxial Accelerometer Data via Data Programming*. Poster presented at CS 221 Final Project Poster Session, Stanford, CA.
Ishfaq, H. (2016, December). *Segmenting Triaxial Accelerometer Data via Data Programming*. Poster presented at CS 221 Final Project Poster Session, Stanford, CA.

Balakrishnan, A., Chaturapruek, T, Fan, F, **Ishfaq, H.**, Roitman, L. (2016, December). *Smarter Initializations in Multi-modal Neural Networks to Predict Transcription Factor Binding*. Poster presented at CS 273B Final Project Poster Session, Stanford, CA.

Ishfaq, H.*, Washington, P.*, Sahasrabudhe, S.* (2015, December). *Predicting Future Interactions Between Users in Signed Social Networks*. Poster presented at CS 224W Final Project Poster Session, Stanford, CA.

Teaching Experience

Fall	2015	Teaching Assistant, Machine Learning (Andrew Ng)
Winter	2016	Teaching Assistant, Cryptography (Dan Boneh)
Winter	2017	Teaching Assistant, Probabilistic Graphical Model (Stefano Ermon)
Summer	2011	Academic Mentor, Bangladesh National Mathematics Camp

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, R, Julia, Matlab, C/C++.

Languages

English (Fluent), Bengali (Native), Japanese (Conversational Level).