Samin Yeasar Arnob

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PhD student in Computer Science
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CONTACT INFORMATION

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RESEARCH INTEREST

Imitation learning, Inverse Reinforcement Learning, Generative Adversarial Networks, Hierarchical Learning

During Masters I have worked on Adversarial Inverse Reinforcement Learning algorithms focusing on improving robustness of the performance in imitation and transfer learning.

EDUCATION

MCGILL UNIVERSITY
Doctor of Philosophy
Computer Science
Jan'20-Present | Montreal, Canada.
Reasoning and Learning Lab , Mila
Supervisor: Dr. Doina Precup

MCGILL UNIVERSITY
Master of Engineering (Thesis)
in Electrical & Computer Engineering
Jan'18-April'20 | Montreal, Canada.
Systems and Control Lab, Center for Intelligent Machines(CIM)
Supervisor: Dr. Aditya Mahajan

INTERNSHIP

MILA, MONTREAL
Project: MineRL competition , NeurIPS 2019.
We explore learning transferable skills over multiple environments from MineCraft gaming environment using imitation learning.
Supervisor: Dr. Doina Precup

ACADEMIC AWARD

- Graduate Excellence Fellowship'18
  McGill University
- Honorable Mention
  IEEE SP CUP 2016

COURSEWORK

TEACHING ASSISTANT
COMP 551 - Applied Machine Learning
GRADUTE COURSE
Winter 2019
COMP 767 - Reinforcement Learning
Fall 2018
COMP 652 - Machine Learning
ECSE 509 - Probability and Random Signals 2
Winter 2018
COMP 551 - Applied Machine Learning
ECSE 506 - Stochastic Control and Decision Theory

SUMMER SCHOOL
Deep Learning & Reinforcement Learning Summer School 2018

RESEARCH EXPERIENCE

Improving robustness in Adversarial Inverse Reinforcement Learning

For masters thesis worked on Off-Policy Adversarial Inverse Reinforcement Learning (Off-policy-AIRL) algorithm which is sample efficient as well as gives good imitation performance compared to the state-of-the-art imitation learning algorithm in the continuous control tasks. Also show the utility of learning inverse reinforcement learning over imitation learning algorithms by using the learned reward function to retrain the policy over a task under significant variation where expert demonstrations are absent.

Doubly Robust Estimators in Off-Policy Actor-Critic Algorithms

It's an ongoing work, jointly collaborated with Riashat Islam and Doina Precup from MILA. Our partial work got accepted for **Spot Light presentation** at **RLDM 2019** . Policy gradient methods, a wide class of model-free algorithms is used to solve continuous control tasks, suffer from instability due to high variance in performance. In this work, we extend the idea of doubly robust off-policy evaluation in actor-critic algorithms to reduce performance variance.

Identification of ENF Based Grid of Origin Classification System for Media Signals using Machine Learning

Worked on Classification of Media Files based on their location of recording, using Machine Learning for **IEEE SP CUP 2016** .Our work **ranked 11th** (Fourier's Underlings) worldwide among 52 teams representing 23 countries. **Github** , **Sigport**

GRADUATE PROJECT

Robustness of Adversarial Inverse Reinforcement Learning

For COMP-767 course project, compared the policy performance of DAC with off-policy AIRL and investigated robustness of the algorithm in transfer learning in dynamic environments.

Reproducibility-Challenge - ICLR 2019

As a project for COMP-652 participating on reproducibility challenge on **"Discriminator Actor-Critic"** (DAC), which is a adversarial imitation learning algorithm solves sample efficiency and reward bias problem of previous standard algorithms. (Featured in course website: **COMP 652-Machine Learning**)

Ablation study - ICLR 2018

As a project for COMP-551, did ablation study of paper **"Go for a walk and arrive at the answer"** which introduces algorithm MINERVA, a reinforcement learning-based model which answers queries on a knowledge graph. **read more**

PUBLICATION

MACHINE LEARNING

- R Islam, SY Arnob and D Precup."Doubly Robust Estimators in Off-Policy Actor-Critic Algorithms" - Accepted in RLDM-2019, Montreal, Canada.
- SY Arnob, R. Ohib, M. Muhaisin, T. Bin Hassan. "Power File Extraction Process from Bangladesh Grid and Exploring ENF Based Classification Accuracy using Machine Learning " - IEEE Region 10 Humanitarian Technology Conference 2017. DOI: **10.1109/R10-HTC.2017.8288911**
- R. Ohib, SY Arnob, M. Muhaisin, R. Arefin, T. Reza and MR. Amin, "ENF Based Machine Learning Classification for origin of Media Signals: Novel Features from Fourier Transform Profile." Accepted at :**iceecs2018** and presented on 13-14 Nov, 2018.

COMPUTATIONAL NANO-PHOTONICS

- R. Ohib, SY Arnob, Md. S. Ali, R. Sagor and MR. Amin. "Metal Nanoparticle Enhanced Light Absorption in GaAs Thin-Film Solar Cell" – 2016 IEEE Asia-Pacific Conference on Applied Electromagnetics Langkawi, Malaysia. DOI: **10.1109/APACE.2016.7916482**