RAIHAN SERAJ

PhD Student in Machine Learning, Systems and Control Lab, McGill University

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EDUCATION

PhD in Electrical and Computer Engineering

McGill University

Jan. 2019 – Present Montreal, Canada

Research area:Reinforcement learning, Multi-agent systems, Game theory, Human Robot Teams.

Affiliations: Montreal Institute of Learning Algorithms (MILA), Center for Intelligent Machines (CIM), Group for Research in Decision Analysis (GERAD)

MEng in Electrical and Computer Engineering

McGill University

Jan. 2017 – Jan. 2019 Montreal, Canada

Research area: Reinforcement learning, Time series modelling.

BSc in Electrical and Electronic Engineering

Islamic University of Technology

Dec. 2011 – Dec. 2015 Dhaka, Bangladesh

PUBLICATIONS

- **Raihan Seraj**, Jerome Le Ny and Aditya Mahajan "Mean-field approximation for large-population beauty-contest games".
- Jayakumar Subramanian, Amit Sinha, **Raihan Seraj** and Aditya Mahajan. "Approximate information state for approximate planning and reinforcement learning in partially observed systems."
- Jayakumar Subramanian, **Raihan Seraj** and Aditya Mahajan ”Reinforcement learning for mean-field teams” AAMAS Workshop on Adaptive and Learning Agents, Montreal, Canada, 13-17 May, 2019.
- Riashat Islam, **Raihan Seraj**, Pierre-Luc Bacon, Doina Precup. “Entropy Regularization with Discounted Future State Distribution in Policy Gradient Methods”, NeurIPS 2019 workshop on Optimization Foundations for Reinforcement Learning.
- Riashat Islam, **Raihan Seraj**, Samin Yeasar Arnob, Doina Precup. “Doubly Robust Off-Policy Actor Critic Algorithms for Reinforcement Learning”, NeurIPS 2019 workshop on Safety and Robustness in Decision Making.
- **Raihan Seraj**, Mohiuddin Ahmed ”Concept drifts for big data”, Combating Security Challenges in the Age of Big Data - Powered by State-of-theArt Artificial Intelligence Techniques, Springer.
- Ahmed, Mohiuddin, **Raihan Seraj**, and Syed Mohammed Shamsul Islam. "The k-means algorithm: A comprehensive survey and performance evaluation." Electronics 9.8 (2020): 1295.

EXPERIENCE

Scientist in Residence

Paladin AI

Mar. 2020 – Oct. 2020 Montreal, Canada

- Worked on learning algorithms for automatic flight data segmentation through automatic feature learning.
- Devised learning algorithms for handling time series data from aircraft simulators that can identify and segment pilot reactions to malfunctions and assign these reactions a proficiency metric.

Research Intern

Aerial AI

Mar. 2018 – May 2019 Montreal, Canada

- Developed deep learning algorithms for real time indoor localization and fall detection with high dimensional Wi-Fi CSI data.
- Filed a patent provisional for handling concept drift for Wi-Fi localization using phase and magnitude augmentaion.

Research Engineer

University of Dhaka

Dec. 2015 – Dec. 2016 Dhaka, Bangladesh

- Developed software for 12 lead ECG measurements in android.
- Used machine learning algorithms for automatic detection of QRS complexes for acceptable ECG trace.
- Developed software for automatic frequency domain analysis to identify neurological disorder from evoked EMG responses

SKILLS

Python Pytorch Chainer Scikit-Learn Linux
Matlab Julia Java HTML Git Wordpress

PROJECTS

- Particle filters for SLAM in Robotics.
- Learning in Games.
- Reinforcement learning in multi-agent swarms.
- Unifying on-policy and off-policy learning in TD Learning and actor critic methods.
- Analysis of convergence of BFGS and Conjugate gradient.
- Evaluation of value-based and policy-based methods in dynamic multi-drug therapies for HIV treatment.
- Analysis of regularized logistic regression and kernel function.