

Pierre Thodoroff

McGill University

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EDUCATION

Master of Computer Science, Machine Learning
McGill University

2016-2019

- Thesis: *Temporal Regularization for Markov Decision Process*.
- Supervised by Professor Pineau.
- Member of the Montreal Institute for Learning Algorithms(MILA).

Bachelor of Science, Mathematics and Computer Science
McGill University

2012-2016

- Research: *Deep learning for automatic seizure detection*.
- Supervised by Professor Pineau.
- Principal's Student-Athlete Honour Roll.
- Exchange Semester at Nanyang Technological University, Singapore.

INDUSTRY EXPERIENCE

Intern at IBM Research
Machine Learning for Healthcare, Israel

June-August 2017
(Supervisor: Tal El-Hay)

- Exploit advances in Generative Adversarial Network to improve techniques used to estimate the causal effect of a treatment in observational studies. Design a balancing method that outperforms Inverse Propensity Weighting and other re-weighting methods.
- Estimate the efficacy of a treatment on skin cancer using observational studies.

PUBLICATIONS

Citations: 120, h-index: 3 (November 2019)

P. Thodoroff, N. Anand, L. Gaccia, J. Pineau, D. Precup: *Recurrent Value Functions*,
Proceedings of Reinforcement Learning and Decision Making Conference (**RLDM**), 2019

P. Thodoroff, A. Durand, J. Pineau, D. Precup: *Temporal Regularization in Markov Decision Process*,
Proceedings of Neural Information Processing Conference (**NeurIPS**), 2018

P. Thodoroff, J. Pineau, A. Lim: *Learning Robust Features using Deep Learning for Automatic Seizure Detection*,
Proceedings of Machine Learning for Healthcare (**MLHC**), 2016

P. Thodoroff, T. El-Hay: *Adversarial Balancing for Causal Inference*,
NeurIPS Causal Inference Workshop, 2017

P. Thodoroff, J. Pineau: *Efficient Deep Learning for Automatic Seizure Detection*,
ICML Data-Efficient Machine Learning Workshop, 2016

TEACHING

Teaching Assistant 2016-2018
McGill University

- Theoretical Machine Learning, Applied Machine Learning, Algebra.

Tutor volunteer in Mathematics and Computer Science 2013-2016
McGill University

- Official tutor for the *Office for Students with Disabilities* and the *Computer Science department*.

DIVERS

Talks

- Reinforcement Learning Tutorial. *IVADO Machine Learning Workshop 2018*.
- Causality in Healthcare. *McGill University 2018*.
- Machine Learning for Healthcare. *Undergraduate Research Symposium 2017*.
- Deep Learning Tutorial. *Osmos Data Workshop 2017*.

Reviewer 2018

- Undergraduate research Symposium at McGill.

Patent 2018

- US patent pending number 16/182635. *Adversarial balancing for causal inference*.

RESEARCH EXPERIENCES

Temporal Regularization in Markov Decision Process 2018
Supervised by Joelle Pineau, Doina Precup and Audrey Durand

- Several applications of Reinforcement Learning suffer from instability due to high variance. Most existing regularization techniques focus on spatial (perceptual) regularization. This paper introduces and explores the concept of temporal regularization. We formally characterize the bias induced by this technique using Markov chain concepts.

Adversarial balancing for causal inference 2017
Supervised by Tal El-Hay

- Biases in observational data of treatments pose a significant challenge to estimating expected treatment outcomes in different populations. An important technique that accounts for these biases is reweighting samples to minimize the discrepancy between treatment groups. We present and analyze a novel reweighting approach that uses bi-level optimization inspired by adversarial training.

Deep Learning for Automatic Seizure Detection 2016
Supervised by Joelle Pineau and Andrew Lim

- We present and evaluate the capacity of a deep neural network to learn robust features from EEG to automatically detect seizures. By simultaneously capturing spectral, temporal, and spatial information, our recurrent convolutional neural network learns a general spatially invariant representation of a seizure.