Aram-Alexandre Pooladian

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Education

PhD (Data Science: Theory track) **New York University**
First year mentors: Jonathan Niles-Weed and Julia Kempe *September 2020 — Present*
Funding: Data Science Fellowship, Data Science Supplementary Fellowship Grant, NSERC PGS-D

MSc (Applied Mathematics) **McGill University**
Focus: Optimization and Deep learning *May 2018 – May 2020 (Expected)*
Advisors: Tim Hoheisel and Adam Oberman
Funding: Lorne Trottier Fellowship, NSERC CGS-M, FRQNT Scholarship, Mitacs Scholarship
GPA: 4.00/4.00

BA (Honours Applied Mathematics) **McGill University**
CGPA: 3.93/4.00, *Majors GPA:* 4.00/4.00 *September 2014 – May 2018*
Awards and scholarships: NSERC Undergraduate Student Research Award (thrice received), FRQNT supplement funding (twice received), Charlie Peters Scholarship, First Class Honours, Dean's Honour List

Research Interests

Optimization theory, high-dimensional statistics, computational and statistical optimal transport, image processing, convex and non-smooth analysis, and problems in deep learning

Research Experience

Conference and workshop publications

- Finlay, C.*, Gerolin, A.*, Oberman, A., **Pooladian, A-A.*** (alphabetical) "Learning normalizing flows from Entropy-Kantorovich potentials", Invertible Neural Networks, Normalizing Flows, and Explicit Likelihood Models (INNF+), with contributing talk, 2020. [arXiv]

- **Pooladian, A-A.***, Finlay, C., Hoheisel, T., and Oberman, A. "A principled approach for generating adversarial images under non-smooth dissimiliarity metrics", Proceedings of the 23rd International Conference on Artificial Intelligence and Statistics (AISTATS), 2020.
  - Github repo to code and paper: `www.github.com/APooladian/ProxLogBarrierAttack` [PyTorch]

- Finlay, C.*, **Pooladian, A-A.***, and Oberman, A. "The LogBarrier attack: making effective use of decision boundary information ", IEEE International Conference on Computer Vision (ICCV), 2019
  - Github repo to code and paper: `www.github.com/cfinlay/logbarrier` [PyTorch]

Journal articles

- Hoheisel, T., Pablos, B., **Pooladian A-A.**, Schwartz, A., and Steverango, L. (alphabetical) "A survey of one-parameter regularization methods for mathematical programs with vanishing constraints" (To appear in *Optimization Methods and Software*) [PDF]

Asterisk next to author name indicates first or joint-first author contribution

Pre-prints and projects

- **Pooladian, A-A.***, Finlay, C., and Oberman, A. "Farkas layers: Don't shift the data, fix the geometry", Pre-print, 2020
  - Github repo to code and paper: `www.github.com/APooladian/FarkasLayers` [PyTorch]
- **Pooladian, A-A.***, Iannantuono, A., Finlay, C., and Oberman, A. "A Langevin dynamics approach to generating sparse adversarial perturbations", Pre-print available (click here), 2019
- **Pooladian, A-A.** "Numerical methods for the Fermat-Weber problem in polyhedral norms", Master's thesis project, 2019

Research awards and scholarships

NSERC PGS-D Scholarship ($63 000 CAD) *May 2020 – May 2023*

Highly competitive graduate scholarship, ranked 8^{th} among applicants in my category.

Data Science Fellowship ($36 000 per 9 months for 5 years) *2020-2025*

Full financial support from the Center for Data Science at New York University

Data Science Supplementary Fellowship Grant ($6 000) *Fall 2020*

IPAM Research Fellow at UCLA ($7 000 USD) *March 2020 – June 2020*

Mitacs Scholarship with Desjardins ($13 000 CAD) *September 2019 – December 2019*

FRQNT Master's Scholarship ($35 000 CAD) *May 2019 – May 2021*

Highly competitive graduate scholarship, ranked 2^{nd} in my category

Lorne Trottier Fellowship ($5 000 CAD) *May 2018 – May 2019*

Awardees are nominated by the faculty to supplement NSERC CGS-M winners

NSERC CGS-M Scholarship ($17 500 CAD) *May 2018 – May 2019*

Highly competitive graduate stipend awarded to ∼3 of 32 applicants in the department

Relevant graduate coursework

- *Probability and Statistics*: Bayesian Statistics, Computational Intensive Statistics, Advanced Probability Theory, Combinatorics, Econometrics I (theory) and II (applications), Concentration Phenomena
- *Modelling theory*: Models in Financial Economics, Mathematical Modeling in Biology
- *Optimization*: Continuous Optimization, Convex Analysis and Algorithms, Applied Machine Learning
- *Analysis*: Partial Differential Equations, Numerical Analysis, Numerical Differential Equations

Professional and extracurricular activities

- Organized a "Topics in Optimal Transport" reading group (Summer 2020)
- President of the Graduate Students Associations of Mathematics and Statistics (GSAMS) (2019 – 2020)
- Co-organizer for the Directed Reading Program (DRP) at McGill University (2019 – 2020)
- Academic reviewer for Winter conference on Applications to Computer Vision (WACV)
- Teaching assistant for Honours Calculus 1 at McGill University (Fall 2018)

Programming languages

PyTorch (∼2.5 years), Python (∼4 years), MATLAB (∼5 years)