

Aram-Alexandre Pooladian

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Education

PhD (Data Science: Theory track)

First year mentors: Jonathan Niles-Weed and Julia Kempe

Funding: Data Science Fellowship, Data Science Supplementary Fellowship Grant, NSERC PGS-D

New York University

September 2020 — Present

MSc (Applied Mathematics)

Focus: Optimization and Deep learning

Advisors: Tim Hoheisel and Adam Oberman

Funding: Lorne Trottier Fellowship, NSERC CGS-M, FRQNT Scholarship, Mitacs Scholarship

GPA: 4.00/4.00

McGill University

May 2018 – May 2020 (Expected)

BA (Honours Applied Mathematics)

CGPA: 3.93/4.00, *Majors GPA:* 4.00/4.00

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

McGill University

September 2014 – May 2018

Research Interests

Convex and non-smooth analysis, high-dimensional statistics, optimal transport, optimization theory, image processing, and optimization problems in deep learning (e.g. adversarial attacks)

Research Experience

Submissions

- o Finlay, C. *, Gerolin, A. *, Oberman, A., **Pooladian, A-A. *** (alphabetical) "Learning normalizing flows from Entropy-Kantorovich potentials" (2020) [arXiv]

Conference publications

- o **Pooladian, A-A. ***, Finlay, C., Hoheisel, T., and Oberman, A. "A principled approach for generating adversarial images under non-smooth dissimilarity 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]
- o 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

- o 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*)

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)	<i>May 2020 – May 2023</i>
Highly competitive graduate scholarship, ranked 8 th among applicants in my category.	
Data Science Fellowship (\$36 000 per 9 months for 5 years)	<i>2020-2025</i>
Full financial support from the Center for Data Science at New York University	
Data Science Supplementary Fellowship Grant (\$6 000)	<i>Fall 2020</i>
Mitacs Scholarship with Desjardins (\$13 000 CAD)	<i>September 2019 – December 2019</i>
FRQNT Master's Scholarship (\$35 000 CAD)	<i>May 2019 – May 2021</i>
Highly competitive graduate scholarship, ranked 2 nd in my category	
Lorne Trottier Fellowship (\$5 000 CAD)	<i>May 2018 – May 2019</i>
Awardees are nominated by the faculty to supplement NSERC CGS-M winners	
NSERC CGS-M Scholarship (\$17 500 CAD)	<i>May 2018 – May 2019</i>
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)