Aram-Alexandre Pooladian

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Education

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

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

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

Submitted

○ 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" (Submitted
to *Optimization Methods and Software*, 2020)

Conference publications

○ 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]

○ **Pooladian, A-A.***, Finlay, C., Hoheisel, T., and Oberman, A. "A principled approach for generating adver-
sarial 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]

○ **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]

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

Projects

o **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

o **Pooladian, A-A.** "Numerical methods for the Fermat-Weber problem in polyhedral norms", Master's thesis project, 2019

o **Pooladian A-A.**[*], and Orfanides, G. "Sparse autoencoder via Scholtes relaxation scheme", Course project, Fall 2018

Research awards and scholarships

Data Science Fellowship ($36 000 per 9 months)   *2020-2025*
Full financial support from the Center for Data Science at New York University

Data Science Supplementary Fellowship Grant ($6 000)   *Fall 2020*
One-time supplemental funding award

IPAM Research Fellow at UCLA ($7 000 USD)   *March 2020 – June 2020*
Full funding to attend long program at UCLA on high dimensional PDEs and Optimal Transport

Mitacs Scholarship with Desjardins ($13 000 CAD)   *September 2019 – December 2019*
Research stipend promoting student and industry collaboration

FRQNT Master's Scholarship ($35 000 CAD)   *May 2019 – May 2021*
Highly competitive research stipend (Ranked 2nd amongst all applicants for mathematics)

Lorne Trottier Fellowship ($5 000 CAD)   *May 2018 – May 2019*
Fellowship awarded to supplement NSERC CGS-M Scholarship; awardees are nominated by the faculty

NSERC CGS-M Scholarship ($17 500 CAD)   *May 2018 – May 2019*
Highly competitive graduate stipend awarded to $\sim$3 of 32 applicants in the department

Relevant graduate coursework

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

Professional activities

o President of the Graduate Students Associations of Mathematics and Statistics (GSAMS) (2019 – 2020)
o Co-organizer for the Directed Reading Program (DRP) at McGill University (2019 – 2020)
o Academic reviewer for Winter conference on Applications to Computer Vision (WACV)
o Teaching assistant for Honours Calculus 1 at McGill University (Fall 2018)

Programming languages

PyTorch ($\sim$2 years), Python ($\sim$3 years), MATLAB ($\sim$5 years), R ($\sim$1 year)