

CONTACT
INFORMATION

Department of Computer Science and Operations Research
University of Montréal

Mila, Quebec AI Institute
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RESEARCH
INTERESTS

Statistical machine learning, optimization, high-dimensional statistics, MCMC methods, large-scale and distributed learning systems.

ACADEMIC
APPOINTMENTS**University of Montréal**

September 2017 -

Assistant Professor, Department of Computer Science and Operations Research
Core member, Mila
Canada CIFAR AI chair

Stanford University

2015-2017

Postdoctoral Research Fellow, Departments of Statistics and Computer Science
Supervised by: Associate Prof. [Christopher Ré](#), Adjunct Prof. [Lester Mackey](#)

INDUSTRY
AFFILIATIONS**ElementAI, Montréal**

2018-

Faculty Fellow

EDUCATION

The University of Texas at Austin

PhD, ECE department.

Awarded in August 2015

Advised by: Prof. [Constantine Caramanis](#) and Prof. [Sriram Vishwanath](#)

Thesis topic: Resource-Constrained, Scalable Learning

Technical University of Crete, Chania, Greece

MSc., ECE department.

2008 - 2010

Diploma, Electronic and Computer Engineering (5 year degree),

2002 - 2008

Advisor: Professor [Nikos D. Sidiropoulos](#)

RESEARCH GRANTS	<p>During my first two years of tenure-track work, I was awarded a total of more than 50 PhD-years in competitive funding (about 1.3 million CAD), to be disbursed over a period of 5 years.</p> <ul style="list-style-type: none"> • IVADO Postdoctoral Scholarship, Fellow tier, for my postdoc N. Loizou, awarded December 2019 • Microsoft Research collaborative grant, awarded June 2019 • NSERC Discovery, awarded April 2019 (+ competitive accelerator supplement) • CIFAR Canada AI chair, awarded December 2018 • Fonds de Recherche du Québec, Nature et technologies, Nouveau Chercheur, 2018 • IVADO professorship grant, 2017 	
CURRENT STUDENTS AND POSTDOCS	<p>Braydy Neal (PhD student) Reyhane Askari (PhD student) Adam Ibrahim (PhD student) Alexia Jolicoeur-Martineau (PhD student) Rémi Piché-Taillefer (MSc student) Baptiste Goujeaud (PhD student) Nicolas Loizou (postdoctoral scholar) Manuela Girotti (MSc student) Amartya Mitra (intern)</p>	
PAST STUDENTS, INTERNS AND MENTEES	<p>Brady Neal (graduated MSc, December 2019; continuing his PhD at Mila) Séb Arnold (intern, summer 2018; PhD candidate at USC) Nicolas Gagné (intern, summer 2018; PhD candidate at McGill) Vinayak Tantia (intern, 2018, now at FAIR Montréal) Jian Zhang (mentee; PhD candidate at Stanford) Panos Achlioptas (mentee; PhD candidate at Stanford)</p>	
TEACHING	<p>University of Montreal <i>Theoretical principles for deep learning</i> <i>Fundamentals of machine learning</i> <i>Theoretical principles for deep learning</i> <i>Fundamentals of machine learning</i> <i>Theoretical principles for deep learning</i> Teaching evaluations average: 3.75/4.0</p> <p>The University of Texas at Austin Teaching Assistant—Information Theory</p> <p>Technical University of Crete Teaching Assistant—Telecommunication Networks</p>	<p>Winter 2020 Fall 2019 Winter 2019 Fall 2018 Winter 2018 Spring 2012 Fall 2008</p>

PUBLICATIONS

- W. Azizian, D. Scieur, **I. Mitliagkas**, S. Lacoste-Julien, G. Gidel.
Accelerating Smooth Games by Manipulating Spectral Shapes
Artificial intelligence and Statistics (AISTATS), 2020
- W. Azizian, **I. Mitliagkas**, S. Lacoste-Julien, G. Gidel.
A Tight and Unified Analysis of Gradient-Based Methods for a Whole Spectrum of Differentiable Games
Artificial Intelligence and Statistics (AISTATS), 2020
- S. M. Arnold, P. A. Manzagol, R. Babanezhad, **I. Mitliagkas**, N. L. Roux.
Reducing the variance in online optimization by transporting past gradients.
Neural Information Processing Systems (NeurIPS), 2019 [**spotlight presentation**].
- I. Albuquerque, J. Monteiro, T. Doan, B. Considine, T. Falk, **I. Mitliagkas**.
Multi-objective training of Generative Adversarial Networks.
International Conference on Machine Learning (ICML), 2019.
- V. Verma, A. Lamb, C. Beckham, A. Najafi, **I. Mitliagkas**, A. Courville, D. Lopez-Paz, Y. Bengio.
Manifold Mixup: Better Representations by Interpolating Hidden States .
International Conference on Machine Learning (ICML), 2019.
- A. Lamb, J. Binas, A. Goyal, S. Subramanian, **I. Mitliagkas**, Y. Bengio, M. Mozer.
State-Reification Networks: Improving Generalization by Modeling the Distribution of Hidden Representations.
International Conference on Machine Learning (ICML), 2019 [**oral presentation**].
- G. Gidel, R. Askari, M. Pezeshki, G. Huang, S. Lacoste-Julien, **I. Mitliagkas**.
Negative Momentum for Improved Game Dynamics.
Artificial Intelligence and Statistics (AISTATS), 2019.
- J. Zhang, **I. Mitliagkas**.
YellowFin and the Art of Momentum Tuning.
Systems and ML (SysML), 2019.
- P. Achlioptas, O. Diamanti, **I. Mitliagkas**, L. Guibas.
Learning Representations and Generative Models for 3D Point Clouds.
International Conference on Machine Learning (ICML), 2018.
- J. Zhang, **I. Mitliagkas**.
YellowFin: Adaptive optimization for (A)synchronous systems.
Systems and ML (SysML), 2018 [**oral presentation**].
- C. De Sa, B. He, **I. Mitliagkas**, C. Ré, P. Xu.
Accelerated stochastic power iteration.
Artificial Intelligence and Statistics (AISTATS), 2018.
- T. Kurth, J. Zhang, N. Satish, **I. Mitliagkas**, E. Racah, M.A. Patwary, T. Malas, N. Sundaram, W. Bhimji, M. Smorkalov, J. Deslippe, M. Shiryayev, S. Sridharan, P. Dubey.
Deep Learning at 15PF: Supervised and Semi-Supervised Classification for Scientific Data.
Supercomputing (SC), 2017.

- I. Mitliagkas**, L. Mackey.
Improving Gibbs Sampler Scan Quality with DoGS.
International Conference on Machine Learning (ICML), 2017.
- I. Mitliagkas**, C. Zhang, S. Hadjis, C. Ré.
Asynchrony begets Momentum, with an Application to Deep Learning.
Allerton Conference on Communication, Control, and Computing, 2016.
- B. He, C. De Sa, **I. Mitliagkas**, C. Ré.
Scan Order in Gibbs Sampling: Models in Which it Matters and Bounds on How Much.
Neural Information Processing Systems (NIPS), 2016.
- I. Mitliagkas**, M. Borokhovich, A. Dimakis, C. Caramanis.
FrogWild! – Fast PageRank Approximations on Graph Engines.
VLDB, 2015.
- D. Papailiopoulos, **I. Mitliagkas**, A. Dimakis, C. Caramanis.
Finding dense subgraphs through low-rank approximations.
International Conference on Machine Learning (ICML), 2014.
- I. Mitliagkas**, C. Caramanis, P. Jain.
Memory-limited Streaming PCA.
Neural Information Processing Systems (NIPS), 2013.
- I. Mitliagkas**, A. Gopalan, C. Caramanis, S. Vishwanath.
User Rankings from Comparisons: Learning Permutations in High Dimensions.
Allerton Conference on Communication, Control, and Computing, 2011.
- I. Mitliagkas**, N. D. Sidiropoulos, and A. Swami.
Joint Power and Admission Control for Ad-hoc and Cognitive Underlay Networks: Convex Approximation and Distributed Implementation.
IEEE Transactions on Wireless Communications, 2011.
- I. Mitliagkas**, S. Vishwanath.
Strong Information-Theoretic Limits for Source/Model Recovery.
Allerton Conference on Communication, Control, and Computing, 2010.
- I. Mitliagkas**, N. D. Sidiropoulos, and A. Swami.
Distributed Joint Power and Admission Control for Ad-hoc and Cognitive Underlay Networks.
ICASSP 2010.
- I. Mitliagkas**, N. D. Sidiropoulos, and A. Swami.
Convex Approximation-based Joint Power and Admission Control for Cognitive Underlay Networks.
International Wireless Comm. and Mobile Computing Conference, 2008. IWCMC'08. IEEE.
- PREPRINTS,
WORKSHOP PAPERS **I. Albuquerque**, J. Monteiro, T. Falk, **I. Mitliagkas**.
Adversarial target-invariant representation learning for domain generalization.
preprint, 2019.

A. Ibrahim, W. Azizian, G. Gidel, **I. Mitliagkas**.
 Linear Lower Bounds and Conditioning of Differentiable Games
preprint, 2019

A. Jolicoeur-Martineau, **I. Mitliagkas**.
 Connections between Support Vector Machines, Wasserstein distance and gradient-penalty GANs
preprint, 2019

B. Neal, **I. Mitliagkas**.
 In Support of Over-Parametrization in Deep Reinforcement Learning: an Empirical Study
ICML 2019 Workshop on Identifying and Understanding Deep Learning Phenomena

B. Neal, S. Mittal, A. Baratin, V. Tantia, M. Scicluna, S. Lacoste-Julien, **I. Mitliagkas**.
 A Modern Take on the Bias-Variance Tradeoff in Neural Networks
ICML 2019 Workshop on Identifying and Understanding Deep Learning Phenomena

J. Zhang, C. De Sa, **I. Mitliagkas**, C. Ré.
 Parallel SGD: When does averaging help?
Optimization Methods for the Next Generation of Machine Learning Workshop, ICML 2016.

S. Hadjis, C. Zhang, **I. Mitliagkas**, C. Ré.
 Omnivore: An Optimizer for Multi-device Deep Learning on CPUs and GPUs. Technical report, arXiv:1606.04487.

IN THE PRESS

Trudeau meets with newly appointed Canada CIFAR AI Chairs, **CIFAR News**

NERSC Scales Scientific Deep Learning to 15 Petaflops, **HPC Wire**

De la Grèce à l'UdeM: l'étonnant parcours d'Ioannis Mitliagkas, **UdeM Nouvelles**

AWARDS, DISTINCTIONS

CIFAR Canada AI chair

NIPS Foundation, listed among best reviewers, 2018

Gerondelis Foundation Inc.: Graduate Scholarship, 2014

The University of Texas at Austin: Microelectronics and Computer Development (MCD) Fellowship, 2009-2011

Technical University of Crete: Undergraduate excellence award, 2008

State Scholarships Foundation (Greece): Undergraduate excellence award, 2005

Technical Chamber of Greece: Undergraduate excellence award, 2005

PROFESSIONAL SERVICE

Member of the inaugural program committee of SysML:
 The committee's role was to decide the conference's focus and steer its future goals.

Organizer of NeurIPS 2018, 2019 workshop:
 “Smooth Games Optimization and Machine Learning”

Reviewer of MITACS Accelerate grants

Served as head of the scientific committee in charge of evaluating IVADO grants.

Reviewer and AC for a number of journals and conferences including NeurIPS, ICML, COLT, AISTATS, AAAI, ICLR, JMLR, SIGGRAPH, Transactions on Information Theory, ISIT, ICASSP, Transactions on Wireless Communications.

RECENT INVITED
 TALKS (NOT
 INCLUDING
 ACCEPTED PAPER
 PRESENTATIONS)

INFORMS, Seattle, WA	October 2019
Microsoft Research workshop, Montréal, QC	October 2019
Theoretical Advances in Deep Learning, Workshop, Istanbul	July 2019
UT Austin, TX	March 2019
NVIDIA, Webinar	March 2019
ElementAI, Toronto, ON	November 2018
BorealisAI, Toronto, ON	October 2018
USC, Los Angeles, CA	October 2018
Microsoft Research workshop, Montréal, QC	October 2018
ElementAI, Toronto, ON	September 2018
Microsoft Research, Montréal, QC	August 2018
ElementAI, Montréal, QC	June 2018
FAIR, Montréal, QC	May 2018
RLLab, McGill, Montréal, QC	April 2018
ElementAI, Montréal, QC	April 2018
TechAide, Montréal, QC	April 2018
ECE Seminar, UT Austin, TX	March 2018
BayesComp, Barcelona Spain	March 2018
SysML, Stanford CA	February 2018
Google Brain, Montréal	November 2017
Texas Wireless Summit, Austin, TX	October 2017
Colloquium, University of Montréal	September 2017
Colloquium, The University of Texas, Austin	September 2017
AutoML workshop, ICML, Sydney	August 2017
Workshop on Advances in Computing Architectures, Stanford SystemX	April 2016
ITA workshop, San Diego, CA	February 2017
AAAI 2017 Workshop on Distributed Machine Learning	February 2017
Microsoft Research, Cambridge, UK	December 2016
SystemX Stanford Alliance Fall Conference	November 2016
Microsoft Research, New England	October 2016
Allerton Conference, Monticello, IL	September 2016
Google Brain, Mountain View, CA	August 2016
MIT Lincoln Labs, MA	August 2016
NVIDIA, Santa Clara, CA	July 2016