# CHARLES GUILLE-ESCURET

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## EDUCATION

**Montréal Institute of Learning Algorithms (MILA), Université de Montréal (UdeM)** *Montréal, Canada*
*Candidate for Doctor of Philosophy in Computer Science; GPA 4.3/4.0* *2019 – Expected Jan. 2024*

**École Normale Supérieure Paris-Saclay** *Paris, France*
*Master of Science in Applied Mathematics - MVA program ; cum laude* *2016*
*Bachelor of Computer Science; cum laude* *2014*

## EXPERIENCE

**ServiceNow, ATG Research Group** *Montréal, Canada*
***Visiting Researcher**, Low-data learning team (part-time)* *Dec. 2021 - Present*
• Trained self-supervised contrastive models on images, and leveraged their similarity functions with a novel method to perform anomaly detection on challenging benchmarks.
• Achieved SotA results on adversarial sample detection and comparable to SotA on OOD detection, while requiring no labels or tuning on OOD samples.

**Montréal Institute of Learning Algorithms (MILA), Université de Montréal (UdeM)** *Montréal, Canada*
***Doctoral Research Assistant**, advised by Prof. Ioannis Mitliagkas* *2019 – Expected Jan. 2024*
• Research Areas: *First-order optimization, computer vision, learning dynamics*
• Teaching assistant for 3 classes and co-supervised 3 internships.
• Introduced a new theoretical framework for the study of first-order optimization.
• Derived novel upper and lower bounds on the convergence rate of first-order algorithms.
• Contributed to various projects on applications such as insect classification, lightning current prediction, predictive visualization of flood effects, adversarial robustness.

**University of California Berkeley** *Berkeley, CA*
***Visiting Scholar**, EECS department, under the supervision of Prof. Alexandre Bayen* *Oct. 2017 - Oct. 2018*
• Worked with startup *SafelyYou* to implement then-SOTA computer vision models for automatic fall detection in elderly care facilities.
• Resulted in a 80% decrease in ER visits and 40% decrease in fall frequency.

**Elum Energy** *Paris, France*
***Machine Learning Engineer*** *Sept. 2016 – Mar. 2017*
• Built from scratch all predictive models for energy consumption.
• These models were successfully deployed to optimize battery usage.
• Conducted interviews, designed and evaluated tests for ML recruitment.

**National Institute of Informatics (NII)** *Tokyo, Japan*
***Machine Learning Research Intern** under the supervision of Prof. Yusuke Miyao* *Apr. – Aug. 2016*
• Designed algorithms to estimate SparQL logical queries on Freebase from QA pairs to train NLP algorithms.

## HONORS AND AWARDS

**Best Student Paper Award** NeurIPS OPT2020, for "A Study of Condition Numbers for First-Order Optimization" *2020*
**Data Intelligence Award - Predictive Analytics** Data Intelligence Forum Paris, for work at Elum Energy *2016*
**Scholar Award**, NeurIPS 2022 *2022*
**Normalien Fellowship** 4 years merit-based fellowship *2013*
**3rd Prize Nationwide** French Earth Sciences Olympiads *2009*

## TEACHING EXPERIENCE

**Mila and UdeM, IFT3395 and IFT6390 Fundamentals of Machine Learning, Teaching Assistant** *Fall 2019*
• Designed and taught Python workshops for Machine Learning.
• Contributed to writing assignments and exams and their grading.

**HEC Montreal, MATH80629A ML for Large Scale Data Analysis and Decision Making, Teaching Assistant** *Winter 2021*
• Designed and taught Python workshops for Machine Learning, assisted students.

**UdeM, EDUlib, SD1FR MOOC Data Science, Instructor** *Jan. - Aug. 2021*
• Developed Jupyter Notebooks for an online MOOC on data science hosted by EDUlib.

**Mila, internship co-supervisor** *2020*

- Academic co-supervisor for 3 students of Mila's professional masters in AI doing their internship in external companies.

## OTHER ACADEMIC EXPERIENCES

- **Co-organizer**, 4th Neural Scaling Laws workshop

## PUBLICATIONS

*: co-first authors

**Guille-Escuret C.**, Rodriguez P., Vazquez D., Mitliagkas I., Monteiro J. (2022). Contrastive Self-supervision Defines General-Purpose Similarity Functions, accepted at *NeurIPS 2022, Self-supervised learning - theory and practice workshop*.

**Guille-Escuret C.**, Ibrahim A., Goujaud B., Mitliagkas I. (2022). Gradient Descent Is Optimal Under Lower Restricted Secant Inequality And Upper Error Bound, accepted at *NeurIPS 2022*.

**Guille-Escuret C.**, Rodriguez P., Vazquez D., Mitliagkas I., Monteiro J. (2022). CADet: Fully Self-Supervised Anomaly Detection With Contrastive Learning, under review at *ICLR 2023*.

Ibrahim A., **Guille-Escuret C.**, Mitliagkas I., Rish I., Krueger D., Bashivan P. (2022). Towards Out-of-Distribution Adversarial Robustness, Presented at ICML 2022 New Frontiers In Adversarial Machine Learning Workshop, under review at ICLR 2023.

**Guille-Escuret C.***, Goujaud B.*, Girotti M., Mitliagkas I. (2021). A Study of Condition Numbers for First-Order Optimization, *AISTATS 2021*, Presented at *AISTATS 2021* and best student paper award at *NeurIPS 2020, Optimization for Machine Learning Workshop*.

**Guille-Escuret C.***, Monferran P.*, Guiffaut C., Reineix A. (2021). Prediction of Lightning Currents on Fastening Assemblies of an Aircraft Fuel Tank with Machine Learning Methods, under review at *IEEE Transactions on electromagnetic compatibility*.

Boussioux L., Giro-Larraz T., **Guille-Escuret C.**, Cherti M., Kégl B. (2019). InsectUp: Crowdsourcing Insect Observations to Assess Demographic Shifts and Improve Classification, Presented at *ICML 2019, Workshop on AI for Social Good* and *ICCV 2019, Workshop on Wildlife Conservation*