Damien Scieur

Senior Research Scientist

Ph.D. in Optimization and Machine Learning

Montreal, QC, Canada
damien.scieur@gmail.com
Google Scholar

Research profile. Optimization and machine-learning researcher specializing in acceleration methods; recent work extends to world models and the theoretical foundations of adaptive optimizers. Author of 35+ publications in NeurIPS, ICML, ICLR, AISTATS, *Mathematical Programming*, and *Foundations and Trends in Optimization*.

EXPERIENCE

2023 – present **Senior Research Scientist, Samsung SAIL Montreal**
Research on optimization and machine learning; supervision of Ph.D. students and interns; academic and industrial collaborations.

2020 – present **Adjunct Professor, DIRO, Université de Montréal** (Mila member)
Academic affiliation within the Montreal ML ecosystem; co-supervision of Ph.D. students and collaborative research.

2019 – 2023 **Research Scientist, Samsung SAIL Montreal**
Research on accelerated optimization, geometric methods, game-theoretic optimization, and machine-learning systems.

2018 – 2019 **Postdoctoral Research Associate, Princeton University, Computer Science Department**
Research on quasi-Newton methods and stochastic optimization, hosted by Elad Hazan.

Fall 2016 **Teaching Assistant, Convex Optimization, École Normale Supérieure**
Graduate-level convex optimization teaching support.

HONORS & RECOGNITION

2020 **Best Paper Award**, Samsung Advanced Institute of Technology (SAIT); $6,000 prize.

2019 **Best PhD Thesis**, PSL | ADELI Artificial Intelligence, Data Sciences and Interfaces.

2016 **NeurIPS / NIPS Oral**, *Regularized Nonlinear Acceleration*.

EDUCATION

2015 – 2018 **Ph.D. in Optimization and Machine Learning, INRIA Paris**
Marie Skłodowska-Curie Actions fellow, SPARTAN project. Supervised by Alexandre d'Aspremont and Francis Bach. Thesis: *Acceleration in Optimization*.

2013 – 2015 **M.Sc. in Applied Mathematics Engineering, UCL, Belgium**
Specialization in optimization, operations research, and automatic control. Thesis with Yurii Nesterov: *Global complexity analysis for second-order methods*.

SUPERVISION

Sole supervision Lucas Maes, Ph.D. at DIRO; Lewis Liu, M.Sc. at DIRO, now Ph.D. student at Stanford; Carles Domingo-Enrich, intern at Mila, now Ph.D. student at NYU.

Co-supervision Mainsi Rankawat, Leonardo Cunha, Baptiste Goujaud, Waïss Azizian.

ACADEMIC SERVICE

Jury member Yassine Kamri, Ph.D. defense jury, UCLouvain; Kevin Xiao, Ph.D. qualifying exam, McGill; Pedram Khorsandi, Predoc II&III, Université de Montréal.

Reviewing ICML, NeurIPS, COLT, OPT; *Mathematical Programming*, IEEE TSP, TMLR, Computational Optimization and Applications, EURO Journal on Computational Optimization.

Organization MTL MLOpt, bi-weekly meetings on optimization and machine learning at Mila.

PUBLICATIONS

Book

[1] A. d'Aspremont, D. Scieur, and A. Taylor. "Acceleration methods". In: *Foundations and Trends in Optimization* 5.1-2 (2021), pp. 1–245.

Software

[2] L. Maes, Q. L. Lidec, D. Haramati, N. Massaudi, D. Scieur, Y. LeCun, and R. Balestriero. "stable-worldmodel-v1: Reproducible world modeling research and evaluation". In: *arXiv preprint arXiv:2602.08968* (2026).

[3] L. Cambier and D. Scieur. *Fast (finally an sddp toolbox)*. 2019.

Thesis

[4] D. Scieur. "Acceleration in optimization". PhD thesis. Université Paris sciences et lettres, 2018.

Journal articles

[5] R. Bollapragada, D. Scieur, and A. d'Aspremont. "Nonlinear acceleration of momentum and primal-dual algorithms". In: *Mathematical Programming* (2022).

[6] A. Papavasiliou, Y. Mou, L. Cambier, and D. Scieur. "Application of stochastic dual dynamic programming to the real-time dispatch of storage under renewable supply uncertainty". In: *IEEE Transactions on Sustainable Energy* 9.2 (2017), pp. 547–558.

Peer-reviewed conference papers

[7] D. Scieur, D. Martínez-Rubio, T. Kerdreux, A. d'Aspremont, and S. Pokutta. "Strongly Convex Sets in Riemannian Manifolds". In: *The Fourteenth International Conference on Learning Representations*. 2026.

[8] T. Zhang, L. Maes, A. Milligan, A. Jolicoeur-Martineau, I. Mitliagkas, D. Scieur, S. Lacoste-Julien, and C. Guille-Escuret. "Understanding Adam requires better rotation-dependent assumptions". In: *Advances in Neural Information Processing Systems* 38 (2026), pp. 115111–115152.

[9] D. Scieur. "Adaptive Quasi-Newton and Anderson acceleration framework with explicit global (accelerated) convergence rates". In: *International Conference on Artificial Intelligence and Statistics*. PMLR. 2024, pp. 883–891.

[10] L. Cunha, G. Gidel, F. Pedregosa, D. Scieur, and C. Paquette. "Only tails matter: Average-case universality and robustness in the convex regime". In: *International Conference on Machine Learning*. PMLR. 2022, pp. 4474–4491.

[11] B. Goujaud, D. Scieur, A. Dieuleveut, A. B. Taylor, and F. Pedregosa. "Super-acceleration with cyclical step-sizes". In: *International Conference on Artificial Intelligence and Statistics*. PMLR. 2022, pp. 3028–3065.

[12] D. Scieur, G. Gidel, Q. Bertrand, and F. Pedregosa. "The curse of unrolling: Rate of differentiating through optimization". In: *Advances in Neural Information Processing Systems* 35 (2022), pp. 17133–17145.

[13] T. Kerdreux, L. Liu, S. Lacoste-Julien, and D. Scieur. "Affine invariant analysis of Frank-Wolfe on strongly convex sets". In: *International conference on machine learning*. PMLR. 2021, pp. 5398–5408.

[14] D. Scieur and Y. Kim. "Connecting sphere manifolds hierarchically for regularization". In: *International Conference on Machine Learning*. PMLR. 2021, pp. 9399–9409.

[15] D. Scieur, L. Liu, T. Pumir, and N. Boumal. "Generalization of Quasi-Newton methods: application to robust symmetric multisecant updates". In: *International Conference on Artificial Intelligence and Statistics*. PMLR. 2021, pp. 550–558.

[16] W. Azizian, D. Scieur, I. Mitliagkas, S. Lacoste-Julien, and G. Gidel. "Accelerating smooth games by manipulating spectral shapes". In: *International Conference on Artificial Intelligence and Statistics*. PMLR. 2020, pp. 1705–1715.

[17] C. Domingo-Enrich, F. Pedregosa, and D. Scieur. "Average-case acceleration for bilinear games and normal matrices". In: *International Conference on Learning Representations*. 2020.

[18] S. Jelassi, C. Domingo-Enrich, D. Scieur, A. Mensch, and J. Bruna. "Extra-gradient with player sampling for faster convergence in n-player games". In: *International Conference on Machine Learning*. PMLR. 2020, pp. 4736–4745.

[19] F. Pedregosa and D. Scieur. "Acceleration through spectral density estimation". In: *International Conference on Machine Learning*. PMLR. 2020, pp. 7553–7562.

[20] D. Scieur and F. Pedregosa. "Universal average-case optimality of Polyak momentum". In: *International conference on machine learning*. PMLR. 2020, pp. 8565–8572.

[21] R. Bollapragada, D. Scieur, and A. d'Aspremont. "Nonlinear acceleration of primal-dual algorithms". In: *The 22nd International Conference on Artificial Intelligence and Statistics*. PMLR. 2019, pp. 739–747.

[22] T. Kaneda, D. Scieur, L. Cambier, and P. Henneaux. "Optimal management of storage for offsetting solar power uncertainty using multistage stochastic programming". In: *2018 Power Systems Computation Conference (PSCC)*. IEEE. 2018, pp. 1–7.

[23] D. Scieur, A. d'Aspremont, and F. Bach. "Nonlinear acceleration of stochastic algorithms". In: *Advances in Neural Information Processing Systems 30*. 2017.

[24] D. Scieur, V. Roulet, F. Bach, and A. d'Aspremont. "Integration methods and optimization algorithms". In: *Advances in Neural Information Processing Systems* 30 (2017).

[25] D. Scieur, A. d'Aspremont, and F. Bach. "Regularized nonlinear acceleration". In: *Advances in Neural Information Processing Systems* 29 (2016). Oral presentation.

Workshop papers

[26] L. Maes, I. K. Hajra, A. Batra, H. Van Assel, D. Scieur, and R. Balestriero. "Relational Representation Learning". In: *UniReps: 3rd Edition of the Workshop on Unifying Representations in Neural Models.*

[27] L. Maes, D. Scieur, and R. Balestriero. "LevyScore: A Fast Sample-Wise Confidence Score of Pretrained Joint Embedding Model". In: *UniReps: 3rd Edition of the Workshop on Unifying Representations in Neural Models.*

Preprints and technical reports

[28] S. Dufort-Labbé, M. Hamidi, R. Pascanu, I. Mitliagkas, D. Scieur, and A. Baratin. "Navigating Potholes with Geometry-Aware Sharpness Minimization". In: *arXiv preprint arXiv:2605.16134* (2026).

[29] L. Maes, Q. L. Lidec, D. Scieur, Y. LeCun, and R. Balestriero. "LeWorldModel: Stable end-to-end joint-embedding predictive architecture from pixels". In: *arXiv preprint arXiv:2603.19312* (2026).

[30] A. Courtois, D. Scieur, J.-M. Morel, P. Arias, and T. Eboli. "SING: A plug-and-play DNN learning technique". In: *arXiv preprint arXiv:2305.15997* (2023).

[31] R. L. Priol, F. Kunstner, D. Scieur, and S. Lacoste-Julien. "Convergence Rates for the MAP of an Exponential Family and Stochastic Mirror Descent–an Open Problem". In: *arXiv preprint arXiv:2111.06826* (2021).

[32] D. Scieur. "Generalized framework for nonlinear acceleration". In: *arXiv preprint arXiv:1903.08764* (2019).

[33] D. Scieur, E. Oyallon, A. d'Aspremont, and F. Bach. "Online Regularized Nonlinear Acceleration". In: *arXiv preprint arXiv:1805.09639* (2018).