Armand Gissler

Curriculum Vitae

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Research

(currently) Oct. 2021–Dec. 2024 **PhD in applied mathematics**, *Inria & CMAP, École polytechnique*, supervised by Anne Auger and Nikolaus Hansen
Convergence analysis of Evolution Strategies with Covariance Matrix Adaptation (CMA-ES)

Oct. 2020–June 2021 **Pre-doctoral research internship**, *McGill University, Montreal*, supervised by T. Hoheisel
A note on the K-epigraph.

April–Aug. 2020 **Research internship (M2)**, *Inria Saclay - CMAP École Polytechnique*, supervised by A. Auger
Influence of a line search and of the learning rate on the convergence of Evolution Strategies.

April–Aug. 2019 **Research internship (M1)**, *Maxwell Institute for Mathematical Sciences, University of Edinburgh*, supervised by L. Szpruch
Mean-field stochastic control : Studies of mean-field games, stochastic optimization under McKean-Vlasov dynamics, Markovian controls depending only on the law of the process.

Feb.–June 2018 **Initiation to research internship (L3)**, *Centre de Mathématiques et de leurs Applications (CMLA), ENS Cachan*, supervised by A. Durmus
Studies of non-reversible discrete-time Markov chain : efficiency of MCMC methods, theorical and numerical comparison of non-reversible MCMC algorithm with the Metropolis-Hastings algorithm and the Gibbs sampler.

Studies

Sept. 2019–Aug. 2020 **Master's degree 2nd year (M2) - Mathematics, Vision, Learning**, *École normale supérieure (ENS) Paris-Saclay*
Computational Optimal Transport, Computational Statistics, Convex Optimization, Large-Scale Optimization, Mathematical Methods for Neurosciences, Probabilistic Graphical Models, Geometry and shapes, Biostatistics, Geometrical approaches in statistics, Bayesian machine learning

Sept. 2018–Aug. 2019 **Master's degree 1st year (M1) - Mathematics**, *ENS Paris-Saclay, Université Paris-Saclay, École polytechnique*
Algebra, Analysis, Probabilities, Geometry, Statistics, Optimization, Stochastic processes, Images, Networks

Sept. 2017–Aug. 2018 **Bachelor's degree 3rd year (L3) - Mathematics**, *ENS Paris-Saclay*
Algebra, Differential calculus, Measure theory, Hilbert and Fourier analysis, Complex analysis, ODE numerical analysis, PDE numerical approximation, Probabilities, Quantum mechanics

Sept. 2015–Aug. 2017 **Preparatory class - Mathematics, Physics, Engineering science (MPSI-MP)**, *Lycée Michelet*, Vanves, (equivalent to first two years of a Bachelor's degree)
Mathematics (algebra, analysis, probabilities), Physics (mechanics, thermodynamics, optics, electromagnetism), Chemistry, Engineering science, Computer science, Philosophy, English

Scientific publications

Preprints

Sept. 2024 **Irreducibility of nonsmooth state-space models with an application to CMA-ES**, *Armand Gissler, Shan-Conrad Wolf, Anne Auger and Nikolaus Hansen*, https://hal.science/hal-04713675/

Feb. 2024 **On the irreducibility and convergence of a class of nonsmooth nonlinear state-space models on manifolds**, *Armand Gissler, Alain Durmus and Anne Auger*, https://arxiv.org/pdf/2402.06447.pdf/

Journal articles

April 2024 **Asymptotic estimations of a perturbed symmetric eigenproblem**, *Applied Mathematics Letters*, Armand Gissler, Anne Auger and Nikolaus Hansen, https://inria.hal.science/hal-04386103v1/document/

Sept. 2023 **A note on the K-epigraph**, *Optimization*, Armand Gissler and Tim Hoheisel, https://arxiv.org/pdf/2107.00117.pdf/

Oct. 2021 **Scaling-invariant functions versus positively homogeneous functions**, *Journal of Optimization Theory and Applications (JOTA)*, Cheikh Touré, Armand Gissler, Anne Auger and Nikolaus Hansen, https://arxiv.org/abs/2101.03755/

Conference proceedings

July 2023 **Evaluation of the impact of various modifications to CMA-ES that facilitate its theoretical analysis**, *GECCO 2023*, Armand Gissler, https://hal.science/hal-04089923/file/evaluation2023author_version.pdf/

July 2022 **Learning Rate Adaptation by Line Search in Evolution Strategies with Recombination**, *GECCO 2022*, Armand Gissler, Anne Auger and Nikolaus Hansen, https://inria.hal.science/hal-03644404/document/

Conferences and Seminars

July 2024 **ISMP 2024**, *Convergence analysis of CMA-ES*

July 2024 **Dagstuhl seminar Theory of Randomized Optimization Heuristics**, *Convergence proof of CMA-ES - Analysis of underlying Markov chains*

Apr. 2024 **CMAP PhD students seminar**, *Convergence analysis of evolution strategies with covariance matrix adaptation*

Oct. 2023 **JPS 2023**, *Irreducibility and convergence of nonlinear state-space models*

Sept. 2023 **CJC-MA 2023**, *Convergence of CMA-ES*

July 2023 **BBOB Workshop (GECCO 2023)**, *Evaluation of the impact of various modifications to CMA-ES that facilitate its theoretical analysis*

June 2023 **SIAM OP23**, *Convergence Analysis of Evolution Strategies with Covariance Matrix Adaptation (CMA-ES) via Markov Chain Stability Analysis*

July 2022 **GECCO 2022**, *Learning Rate Adaptation by Line Search in Evolution Strategies with Recombination*

Feb. 2022 **Theory of Randomized Optimization Heuristics (Dagstuhl Seminar 22081)**, *State-dependent drift condition for stability of Markov chains*, Editorial assistant

Teaching

2021–2024 **Teaching assistant**, *Bachelor of Science*, École polytechnique
LAB 102: How to write mathematics

2017–2018 **Oral examinations**, *Lycée Michelet*, Vanves
Two hours oral interrogations every week of mathematics of groups of three students

2017–2018 **Tutoring**, *Institut Villebon-Charpak*, Université Paris-Sud
Tutoring in mathematics and physics for two students in bachelor first year

Laboratory life

2022–2024 **CMAP & CMLS PhD students seminar**, Co-organizer

2022–2024 **Laboratory life commission member**, *CMAP*