Thomas Guilmeau

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https://tguilmeau.github.io/

I am a PhD student interested in the study and design of sampling-based schemes in computational statistics and global optimization. I do so using ideas from information geometry and non-Euclidean optimization schemes. I have also been working on topics related to biological models.

EDUCATION

PhD in applied mathematics, *Université Paris-Saclay, INRIA, CentraleSupélec* October 2021 - present
Stochastic algorithms for global optimization. Part of the project ERC MAJORIS. Under the supervision of E. Chouzenoux and V. Elvira.

MSc in applied mathematics, *Université Paris-Saclay* 2018 - 2020
M2 Optimization: optimal control, continuous optimization (theoretical and numerical aspects), stochastic optimization, game theory, calculus of variations, and tropical algebra.

Engineering degree, *ENSTA Paris, Institut Polytechnique de Paris* 2017 - 2020
Major in applied mathematics: discrete and continuous optimization, control theory, statistics, probability, dynamical systems, and partial differential equations.

EXPERIENCES

Research engineer, *OPIS team (INRIA), Palaiseau, France* December 2020 - September 2021
Stochastic algorithms for global optimization. Part of the project ERC MAJORIS. Under the supervision of E. Chouzenoux and V. Elvira.

Research engineer, *LBE (INRAE), Narbonne, France* October 2020 - November 2020
Development of a Matlab code to simulate metabolic transitions in microbial populations. Part of the projects HME 3BCAR and ANR JANUS.

Master thesis, *INRAE, Montpellier, France* April 2020 - September 2020
Optimal periodic control, with applications to the chemostat model and water bioremediation processes. Under the direction of A. Rapaport.

Research intern, *UTFSM, Valparaíso, Chile* May 2019 - August 2019
Continuity properties and sensitivity analysis of the set of sustainable thresholds for a discrete time controlled system. Under the direction of C. Hermosilla.

TEACHING AND OUTREACH

Teaching assistant, *Optimization - CentraleSupélec* Spring 2020 and Spring 2021
A 4th year course covering linear and convex optimization, integer programming, and introducing some iterative algorithms.

Scientific diffusion mission, *INRIA Saclay* 2022
Talks in high schools about research. Université Paris-Saclay science fair. RJMI (a research-based outreach event directed towards high school girls). Coordination of the writing and the filming of interviews about AI.

PUBLICATIONS

Journal paper

T. Guilmeau and A. Rapaport. **"Singular arcs in optimal periodic control problems with scalar dynamics and integral input constraint"**. *Journal of Optimization Theory and Applications*, vol. 195, pp. 953-975, 2022.

Conference papers

T. Guilmeau, E. Chouzenoux and V. Elvira. **"Proximal-based adaptive simulated annealing for global optimization"**. *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2022.

F. Dupeuble, A. Rapaport, T. Guilmeau, J. Tchouanti, B. Enjalbert, C. Bideaux, J.-P. Steyer, A. Feddaoui-Papin, J. Harmand. **"Deterministic models to decipher the lag phase duration during diauxie"**. *IFAC-PapersOnLine*, vol. 55, issue 20, pp. 481-486, 2022.

T. Guilmeau, E. Chouzenoux and V. Elvira. **"Simulated annealing: a review and a new scheme"**. *Proceedings of the IEEE Statistical Signal Processing Workshop (SSP)*, 2021.

Preprints

T. Guilmeau and A. Rapaport. **"Multiplicity of periodic orbits with coexistence in the chemostat subject to periodic removal rate"**. `https://hal.science/hal-03982233v1`, 2023.

T. Guilmeau, E. Chouzenoux and V. Elvira. **"Regularized Rényi divergence minimization through Bregman proximal gradient algorithms"**. `https://hal.science/hal-03927834v1`, 2022.

LANGUAGES

French: Native speaker
English: Fluent (TOEIC: 990/990)
Spanish: Intermediate level

CODING SKILLS

Advanced: Julia, Matlab, Python, LaTeX
Basic level: C, C++, HTML, CSS

Last edited on March 18, 2023.