



Théo Guyard

Postdoctoral Researcher at Polytechnique Montréal

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1 Academic Curriculum

2025–Now	Postdoctoral Position Location : Polytechnique Montréal, MAGI Department, Canada Advisor : Thibaut Vidal Fundings : SCALE-AI Chair
2021–2024	PhD Location : INRIA (SimSMART) and INSA (MA Department) Rennes, France Title : Branch-and-bound algorithms for L0-regularized problems Advisors : Cédric Herzet, Clément Elvira, Ayşe-Nur Arslan Referees : Jérôme Malick, Nicolas Gillis Examiners : Joseph Salmon, Amélie Lambert
2020–2021	Research Program Location : IRMAR, France Title : Stochastic models for Kidney Exchange Programs Advisor : Jérémie Omer
2019–2020	Research Program Location : INSA Rennes, France Title : Screening methods for L1-regularized problems Advisor : Cédric Herzet
2016–2021	Engineering Degree (MSc equivalent) Location : INSA Rennes, France Specialty : Applied Mathematics

2 Awards & Honors

2023	Best student paper at ROAD-DEF. This prize is awarded at the ROAD-DEF annual congress and rewards a doctoral student for an original academic or industrial contribution. The evaluation covers both the content of the paper and the oral during the congress. The jury was composed of Come Bissuel (EDF), Julien Darlay (Local solver), Alexandre Gondran (ENAC), Nacima Labadie (UTT), Amélie Lambert (CNAM), Sébastien Martin (Huawei), Dimitri Watel (ENSIIE), Sandra Ngueveu (LAAS) and Odile Bellenguez (IMT).
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2022 **Best poster at SMAI-MODE.** This prize is awarded by the SMAI-MODE group and rewards the best poster during the SMAI-MODE days. The jury was composed of Jean-Bernard Lasserre (CNRS), Nouredine Igbida (XLIM), Thibault Liard (XLIM), Simone Naldi (XLIM) and Olivier Prot (XLIM).

3 Publications

International Conference Papers

4. Théo Guyard, Cédric Herzet, Clément Elvira, and Ayşe-Nur Arslan. “A new Branch-and-Bound pruning framework for L0-regularized problems”. In *Forty-first International Conference on Machine Learning*. PMLR. 2024.
3. Théo Guyard, Gilles Monnoyer, Cédric Herzet, and Clément Elvira. “Safe peeling for L0-regularized least-squares”. In *European Conference on Signal Processing (EUSIPCO)*. IEEE. 2023.
2. Théo Guyard, Cédric Herzet, and Clément Elvira. “Node-screening tests for L0-penalized least-squares problem”. In *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. IEEE. 2022.
1. Théo Guyard, Cédric Herzet, and Clément Elvira. “Screen & Relax: Accelerating the resolution of Elastic-net by safe identification of the solution support”. In *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*. IEEE. 2022.

National Conference Papers

4. Théo Guyard, Gilles Monnoyer, Cédric Herzet, and Clément Elvira. “Peeling pour le problème des moindres carrés avec régularisation L0”. In *Groupe de Recherche et d’Etudes de Traitement du Signal et des Images (GRETSI)*. 2023.
3. Théo Guyard. “An efficient solver for L0-penalized sparse problems”. In *Congrès de la Société Française de Recherche Opérationnelle et d’Aide à la Décision (ROADEF)*. 2023.
2. Théo Guyard, Cédric Herzet, Clément Elvira, and Ayşe-Nur Arslan. “Node-screening pour le problème des moindres carrés avec pénalité L0”. In *Groupe de Recherche et d’Etudes de Traitement du Signal et des Images (GRETSI)*. 2022.
1. Théo Guyard, Cédric Herzet, and Clément Elvira. “Screen & Relax: Accélérer la résolution du problème "Elastic-Net" par identification du support de la solution”. In *Groupe de Recherche et d’Etudes de Traitement du Signal et des Images (GRETSI)*. 2022.

Theses and Technical Reports

3. Théo Guyard. “Branch-and-Bound algorithms for L0-regularized problems”. *PhD thesis*. 2024.
2. Théo Guyard. “Acceleration methods for L0 and L1 regularized problems”. *Engineering thesis*. 2021.
1. Théo Guyard. “Stochastic models for Kidney Exchange Programs”. *Research program thesis*. 2020.

4 Tools & Software

Projects as Maintainer

- [exprun](#) Python toolbox to automatize pipelines for reproducible experiments. The package is available on [pypi](#) under MIT license.
- [el0ps](#) Python toolbox to solve L0-regularized problems via flexible and numerically efficient methods. The package is available on [pypi](#) under AGPL-v3 license.
- [libsvmdata](#) Simple tool to fetch [LIBSVM](#) datasets to Julia. The package is available on [julia-packages](#) under MIT license.

Projects as Contributor

- [benchopt](#) BenchOpt is a benchmarking suite for optimization algorithms. It is built for simplicity, transparency, and reproducibility. The package is available on [pypi](#) under BSD-3 license.
- [l0learn](#) Efficient algorithms for L0-regularized learning. It is built for simplicity, transparency, and reproducibility. The package is available on [CRAN](#) and [pypi](#).
- [libsvmdata](#) A python util to fetch datasets from the [LIBSVM](#) website. The package is available on [pypi](#) under BSD-3 license.

5 Presentations

- 2024/12/09 “Solving L0-norm problems via mixed-integer optimization”, *IMAG team seminar*, Montpellier, France.
- 2024/11/27 “Branch-and-Bound algorithms for L0-regularized problems”, *PhD Defense*, Rennes, France.
- 2024/09/16 “Toward stronger relaxations for L0-regularized problems”, *GdR IASIS Workshop*, Institut Henri Poincaré, France.
- 2024/07/24 “A new Branch-and-Bound pruning framework for L0-regularized problems”, *ICML*, Vienna, Austria.
- 2024/03/28 “A generic Branch-and-Bound for L0-penalized problems”, *SMAI-MODE days*, Lyon, France.
- 2024/03/28 “Screen-and-Relax for sparse support identification”, *SMAI-MODE days*, Lyon, France.
- 2024/03/18 “Discrete optimization methods for L0-norm problems”, *Journées Doctorants en Statistiques*, Rennes, France.
- 2024/03/07 “Mixed-integer optimization methods for sparse problems”, *LS2N seminar*, Nantes, France.
- 2023/11/29 “Screen & Relax for sparse support identification”, *PGMO days*, Paris-Saclay, France.
- 2023/11/29 “Safe peeling for L0-penalized problems”, *PGMO days*, Paris-Saclay, France.
- 2023/10/19 “Solving L0-norm problems via mixed-integer optimization”, *INRIA EDGE team seminar*, Bordeaux, France.
- 2023/10/10 “Solving L0-norm problems via mixed-integer optimization”, *INRIA SODA and MIND team seminar*, Paris-Saclay, France.
- 2023/09/09 “Peeling for L0-regularized least-squares”, *EUSIPCO*, Helsinki, Finland.
- 2023/08/30 “Peeling for L0-regularized least-squares”, *GRETSI*, Grenoble, France.

- 2023/05/02 “Unifying Branch-and-Bound approaches to solve L0-penalized problems”, *SIAM Conference on Optimization*, Seattle, USA.
- 2023/02/21 “An efficient solver for L0-penalized sparse problems”, *ROADEF*, Rennes, France.
- 2023/02/17 “The latest report from the CNRS ethics committee: Integrating environmental issues into the conduct of research”, *IRMAR Science and Ethic seminar*, Rennes, France.
- 2022/11/30 “Discrete optimization methods for L0-penalized sparse problems”, *PGMO days*, Paris-Saclay, France.
- 2022/09/30 “Resilience in signal processing and AI”, *IRMAR Science and Ethic seminar*, Rennes, France.
- 2022/09/08 “Node-screening pour le problème des moindres carrés avec pénalité L0”, *GRETSI*, Nancy, France.
- 2022/09/08 “Accélérer la résolution de l’Elastic-Net par identification du support de la solution”, *GRETSI*, Nancy, France.
- 2022/06/01 “Node-screening tests for the L0-penalized least-squares problem”, *SMAI-MODE days*, Limoges, France.
- 2022/05/08 “Node-screening tests for the L0-penalized least-squares problem”, *ICASSP*, Singapore.
- 2022/05/08 “Screen & Relax: Accelerating the resolution of Elastic-Net by safe identification of the solution support”, *ICASSP*, Singapore.

6 Teaching

Course material can be found on my [website](#).

- 2023–2024 ENSAI, Computer Science Department. *UE 1-07: Optimization and numerical methods*. Service: TP (12h equivalent TD) for MSc students.
- 2023–2024 INSA Rennes, Applied Mathematics Department. *DMA06-OD: Discrete optimization*. Service: TP/TD/Project (10h equivalent TD) for MSc students.
- 2023–2024 INSA Rennes, Applied Mathematics Department. *DMA09-PARCI: Sparse models and methods*. Service: CM/TP/TD (13h equivalent TD) for MSc students.
- 2022–2023 INSA Rennes, Applied Mathematics Department. *DMA06-OD: Discrete optimization*. Service: TP/TD/Project (10h equivalent TD) for MSc students.
- 2022–2023 INSA Rennes, Applied Mathematics Department. *DMA09-PARCI: Sparse models and methods*. Service: CM/TP/TD (11h equivalent TD) for MSc students.
- 2022–2023 INSA Rennes, Applied Mathematics Department. *MathC2+ masterclasses*. Service: CM (12h equivalent TD) for high-school students.
- 2021–2022 INSA Rennes, Engineering Department. *STP-03: Linear Algebra*. Service: TD (36h equivalent TD) for BSc students.

7 Scientific Service

- 2022 [MathC2+](#) masterclasses lecturer for high-school students