

Romain Petit

POSTDOCTORAL RESEARCHER IN APPLIED MATHEMATICS

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Academic positions

Postdoctoral researcher

CNRS, ÉCOLE NORMALE SUPÉRIEURE

- Host: Gabriel Peyré

Paris, France

Since Oct. 2024

Postdoctoral researcher

MACHINE LEARNING GENOA CENTER (MALGA), UNIVERSITY OF GENOA

- Topic: nonlinear inverse problems
- Host: Giovanni S. Alberti

Genoa, Italy

Jan. 2023 - Sept. 2024

Education

PhD, applied mathematics

UNIVERSITÉ PARIS DAUPHINE - PSL

- Reconstruction of piecewise constant images via total variation regularization: exact support recovery and grid-free numerical methods
- Supervisors: Vincent Duval and Yohann De Castro
- Committee: B. Buet, A. Chambolle, M. Dambrine (reviewer), S. Masnou, G. Peyré (president), O. Scherzer (reviewer)

Paris, France

Oct. 2019 - Dec. 2022

Master of science, mathematics vision and learning (*Master MVA*)

ÉCOLE NORMALE SUPÉRIEURE PARIS-SACLAY

Paris, France

2018 - 2019

Master of science, applied mathematics (*diplôme d'ingénieur*)

ÉCOLE NATIONALE DES PONTS ET CHAUSSÉES

Paris, France

2015 - 2019

Scientific contributions

ARTICLES

Localization of point scatterers via sparse optimization on measures

GIOVANNI S. ALBERTI, ROMAIN PETIT, MATTEO SANTACESARIA

SIAM Journal on Imaging Sciences, [arxiv:2402.00737](https://arxiv.org/abs/2402.00737)

2024

Exact recovery of the support of piecewise constant images via total variation regularization

YOHANN DE CASTRO, VINCENT DUVAL, ROMAIN PETIT

Inverse Problems, [arxiv:2307.03709](https://arxiv.org/abs/2307.03709)

Short version (in French): GRETSI 2023, [hal-04171535](https://hal.archives-ouvertes.fr/hal-04171535)

2024

Towards off-the-grid algorithms for total variation regularized inverse problems

YOHANN DE CASTRO, VINCENT DUVAL, ROMAIN PETIT

Journal of Mathematical Imaging and Vision, [arxiv:2104.06706](https://arxiv.org/abs/2104.06706)

Short version: SSVM 2021, [arxiv:2104.06706v2](https://arxiv.org/abs/2104.06706v2)

2023

SOFTWARES

TV-SFW

Grid-free numerical resolution of least squares problems with total (gradient) variational regularization

github.com/rpetit/tvsfw

Python, Numba

PyCheeger

Numerical resolution of a generalized Cheeger problem

github.com/rpetit/pycheeger

Python, Numba

PointScat

Localization of pointlike inhomogeneities in an inverse acoustic scattering problem

github.com/rpetit/pointscat

Python, JAX

Teaching

Université Paris Dauphine - PSL

2019 - 2022

DEPARTMENT OF APPLIED MATHEMATICS

- Algebra (bachelor 1st year), courses and exercise sessions, 120 hours
- Probabilities (bachelor 1st year), exercise sessions, 20 hours

Talks

INTERNATIONAL CONFERENCES

Applied Inverse Problems Conference (AIP)

Göttingen, Germany

Sept. 2023

Conference on Calculus of Variations

Lille, France

July 2022

International Conference on Computational and Methodological Statistics (CMStatistics)

London, UK

Dec. 2021

International Conference on Scale Space and Variational Methods in Computer Vision (SSVM)

Online

May 2021

NATIONAL CONFERENCES

Colloque Francophone de Traitement du Signal et des Images (GRETSI)

Grenoble, France

Sept. 2023

Congrès National d'Analyse Numérique (CANUM)

Evian, France

June 2022

SEMINARS AND WORKSHOPS

10 years of the INRIA team MOKAPLAN

Fontainebleau, France

June 2024

Statistics, Probabilities, Optimization and Control seminar (Institut de Mathématiques de Bourgogne)

Dijon, France

Feb. 2024

Applied Analysis seminar (Institut de Mathématiques de Marseille)

Marseille, France

Dec. 2023

Workshop Off-the-grid and Continuous Methods for Optimization and Inverse Problems in Imaging

Paris, France

Nov. 2023

Paris-Saclay Signal Seminar

Paris, France

Nov. 2023

Imaging in Paris seminar

Paris, France

Nov. 2023

Machine Learning and Signal Processing seminar (ENS Lyon)

Lyon, France

Oct. 2023

Seminar of the INRIA team MORPHEME

Sophia-Antipolis, France

April 2023

Inverse Problems and Mathematical Imaging seminar (University of Graz)

Graz, Austria

Nov. 2022

Calculus of Variations seminar (GT CalVa)

Paris, France

May 2022

CEREMADE young researchers seminar (Université Paris Dauphine - PSL)

Paris, France

Nov. 2021

Research visits

University of Warwick, one week (collaborator: Clarice Poon)

Coventry, UK

Jul. 2024

University of Graz, one week (collaborator: Kristian Bredies)

Graz, Austria

Nov. 2022

Bogotá, Colombia

Service

Reviewing

- Journals: Inverse Problems, Numerische Mathematik, Electronic Journal of Statistics
- Conferences: SSVM (2023)

Dissemination

- Participation to the speed searching event of the European night of researchers 2020
- Contribution to the realization of a radio work for the European night of researchers 2019

Skills

Languages

- French: mother tongue
- English: full professional proficiency (TOEIC 985/990)
- Italian: professional proficiency
- Spanish: notions

Programming

- Languages: Python (Numba, JAX), Julia
- Others: LaTeX, Git
- OS: Linux, Windows