

# Gabriele Scrivanti

## PhD in Mathematical Signal and Image Processing

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### 🛠 Work Experience

#### Postdoctoral Researcher,

*Institut Photovoltaïque de l'Île de France, CNRS*

Oct 2024 – present | Palaiseau, France

- Unsupervised learning for multidimensional photoluminescence imaging

#### PhD Candidate in Engineering and Systems Sciences,

*Centre pour la Vision Numérique, CentraleSupélec,*

*Université Paris-Saclay*

Nov 2020 – May 2024 | Gif-Sur-Yvette, France

- Marie Skłodowska-Curie Actions ITN TraDE-Opt
- Thesis Title: "Some Strategies Addressing Non-Convex Variational Problems in Image Processing"
- Supervisors: Prof. Jean-Christophe Pesquet, Prof. Ewa Bednarczuk

#### Visiting Student, Systems Research Institute

May 2022 – Jul 2022 | Warsaw, Poland

- Theoretical analysis of the convergence of the Forward-Backward algorithm in the context of weakly-convex functions
- Supervisor: Prof. Ewa Bednarczuk

#### Intern, Designers

Nov 2021 – Apr 2022 | Warsaw, Poland

- Development of Softwares for Point-Cloud Registration (C++, Python)

#### Intern, Laboratoire I3S

Apr 2020 – Jul 2020 | Sophia-Antipolis, France

- Theoretical and algorithmic developments of Image reconstruction methods with Cauchy Prior
- application to EIT/OCT problems
- Supervisors: Prof. Alin Achim, Dr. Luca Calatroni.

### 🧩 Other Experiences

#### Teaching at CentraleSupélec,

*Laboratory Sessions for the M1 course in Optimisation*

Mar 2021

#### Reviewing Activity, SIAM Journal on Imaging Science,

*SIAM Journal on Mathematics of Data Science, Transactions on Pattern Analysis and Machine Intelligence*

**Mentoring,** Supervision of a master student's internship in cooperation with "Institut Photovoltaïque de l'Île-de-France"

Apr 2022 – Sep 2022

#### Students Representative, Students and Early Stage

*Researchers Representative in the TraDE-Opt Supervisory Board*

Apr 2022 – May 2024

#### Organisation of the TraDE-OPT Summer School,

*Creation and Management of the Virtual Space*

Jul 2021

### 🎓 Education

#### Master Degree in Mathematics,

*University of Bologna - 110/110 Cum Laude*

2017 – 2020 | Bologna, Italy

- Numerical Analysis, Image Processing, Partial Differential Equations, Applied Probability, Information Theory, Applied Analysis, Linear Programming
- Thesis title: *Nonsmooth Nonconvex Variational Reconstruction for Electrical Impedance Tomography*
- Thesis supervisor: Prof. Serena Morigi

#### Erasmus Exchange, University of Bergen

2019 | Bergen, Norway

- Exchange Semester in the Mathematics Department at the University of Bergen
- Applied Statistics, Image Processing and Analysis

#### Bachelor Degree in Mathematics,

*University of Bologna - 105/110*

2014 – 2017 | Bologna, Italy

- Thesis title: *Due algoritmi per la fattorizzazione matriciale non-negativa con applicazione al clustering*
- Thesis supervisor: Prof. Valeria Simoncini

#### Maturità Classica,

*Liceo Classico Simone Weil - 100/100 Cum Laude*

2009 – 2014 | Treviglio, Italy

#### Exchange High School Year,

*Lilla Akademien Musikgymnasium*

2012 – 2013 | Stockholm, Sweden

### 🌐 Languages

#### Italian

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#### English

IELTS, 2018, Europass Level C1

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#### French

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#### Swedish

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#### Norwegian

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### 💻 Computer Skills

Matlab

R

C++

Python

SciPy

NumPy

Scikit-Learn

### 🔑 Interests

Hiking

Reading

Knitting

Yoga

Swimming

Bouldering

## Publications

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E. Chouzenoux, M.C. Corbineau, J.C. Pesquet, G. Scrivanti, "Variational Approach for Joint Image Recovery and Feature Extraction Based on Spatially-Varying Generalised Gaussian Models", *Journal of Mathematical Imaging and Vision*, 2024

G. Vidon, G. Scrivanti, E. Soret, N. Harada, E. Chouzenoux, J.-C. Pesquet, J.-F. Guillemoles, S. Cacovich, "Rapid and Noise-Resilient Mapping of Photogenerated Carrier Lifetime in Halide Perovskite Thin Films", *Advanced Functional Material*, 2024

A Achim, L Calatroni, S Morigi, G Scrivanti, "Space-Variant Image Reconstruction via Cauchy Regularisation: Application to Optical Coherence Tomography", *Signal Processing* Volume 205, April 2023, 108866

M. Huska, D. Lazzaro, S. Morigi, A. Samorè & G. Scrivanti, "Spatially-Adaptive Variational Reconstruction for Linear Inverse Electrical Impedance Tomography", *Journal of Scientific Computing* Volume 84, August 2020

## Submitted Papers

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E. Bednarczuk, G. Bruccola, G. Scrivanti, T. H. Tran., "Forward-Backward Algorithms for Weakly Convex Problems" In arXiv:2303.14021

## Conference Proceedings

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E. Bednarczuk, G. Bruccola, G. Scrivanti, T. H. Tran, "Calculus rules for proximal  $\epsilon$ -subdifferentials and inexact proximity operators for weakly convex functions", 2023 21st European Control Conference (ECC), Bucharest (Romania)

G. Scrivanti, E. Chouzenoux & J.C. Pesquet, "A CNC Approach for Directional Total Variation", 2022 30th European Signal Processing Conference (EUSIPCO), Belgrade (Serbia)

G. Scrivanti, L. Calatroni, S. Morigi, L. Nicholson & A. Achim, "Non-Convex Super-Resolution Of Oct Images Via Sparse Representation", 2021 IEEE 18th International Symposium on Biomedical Imaging (ISBI), Nice (France)

## Invited Talks

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May 2022	<b>A Variational Approach for Joint Image Recovery-Segmentation based on Spatially Varying Generalised Gaussian Models</b> , 10th International Conference "Inverse Problems: Modelling and Simulation" (IPMS 2022) Mini-Symposium "Inverse Problems in Biomedical and Material Imaging",	Malta
May 2022	<b>A Convex-Non-Convex approach for Directional Total Variation</b> , Modern Techniques of Very Large Scale Optimization Workshop Organised at the University of Edinburgh by Prof. Jacek Gondzio, Dr. Stefano Cipolla and Mr. Filippo Zanetti	Edinburgh, Scotland, UK
Mar 2022	<b>A Convex-Non-Convex approach for Directional Total Variation</b> , SIAM Conference on Imaging Science (IS22) Mini-Symposium "Non-convex optimization methods for inverse problems in imaging: from theory to applications",	Berlin, Germany