

# Rémy Leroy, PhD

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Engineer and scientific researcher specialised in image processing and computer vision, with a strong intuitive grasp of visual signal interpretation and a unique interdisciplinary profile bridging optics, physics, and deep learning. Skilled in developing maintainable, well-structured code, and driven by a fundamental need to understand underlying mechanisms. Naturally inquisitive, values clarity, simplicity, and reproducibility in algorithm design.

## Skill

- Machine Learning
- Computer Vision
- Computational Photography
- Scientific Peer Review
- Clean and Maintainable code
- Python/Pytorch

## Work Experience

### Post-doctoral researcher @ INRIA, France | 2023/04 - 2024/08

Explored **signal compression** techniques using **Implicit Neural Representations**, with a focus on Light Field image data.

### PhD candidate in signal and image processing @ ONERA, France | 2019/03 - 2023/03

Gained deep expertise in state-of-the-art methods for **image processing** and **computer vision**.

Designed and implemented deep neural networks using **PyTorch** for **monocular 3D vision**.

Proposed a novel **depth estimation** method that exploits **defocus blur** in single-image inputs.

Developed an end-to-end framework for the **joint optimisation** of optical components and neural networks.

Published and presented original research in peer-reviewed international journals and conferences.

### Research intern @ CEA, France | 2017/09 - 2018/03

Developed an iterative algorithm for removing transformation artefacts in dark matter mass mapping in **Python**

## Education

2023 - Paris-Saclay University, France | **Doctorate in Signal and Image Processing**

2019 - IMT Atlantique (Institut Mines-Telecom), France | **Master's degree in Engineering**

2019 - IMT Atlantique and Rennes 1 University, France | **MSc in Electronic and Automation**

## Publications

*Multitask deep co-design for extended depth of field and depth from defocus.*

M. Dufraisse, R. Leroy, P. Trouvé-Peloux, F. Champagnat, J.-B. Volatier

Proc. **SPIE** 12996, Unconventional Optical Imaging IV, June **2024**

*Learning local depth regression from defocus blur by soft-assignment encoding.*

R. Leroy, P. Trouvé-Peloux, B. Le Saux, B. Buat et F. Champagnat.

**Applied Optics**, vol.61, n°29, p.8843--8849. **2022**

*Pix2Point: Learning Outdoor 3D Using Sparse Point Clouds and Optimal Transport.*

R. Leroy, P. Trouvé-Peloux, F. Champagnat, B. Le Saux, M. Carvlho.

Int. Conf. on **Machine Vision and Applications** (MVA), Oct **2021**