Rémy Leroy

Computer Vision Researcher

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Research Interests

Signal Processing	Computer Vision	Machine Learning	Computational Imaging	Co-Design

Education

Ph.D. in Signal and Images Processing - 11/2019 - 03/2023
Université Paris-Saclay, France

Thesis: *Deep Learning methods for monocular 3D vision systems*

> Development of a **deep learning** algorithm using **optimal transport** for **monocular 3D point cloud estimation** on outdoor scenes.
> Development of a lightweight neural network model for **Depth from Defocus** using soft-assignment encoding.
> Simulations for **co-design** of an **unconventional optical system** and image processing neural networks for **monocular depth estimation** and **extended depth of field.**

Master of Engineering & MSc in Signal, Image, Systems and Automation - 09/2015 - 09/2019
IMT Atlantique, France - GPA 3.7

> Applied Mathematics, Machine learning, Signal Processing
> Electronics, Computer Science
> Introductory courses to research

Exchange semester - 03/2017 - 06/2017
Seoul National University, South Korea

> Statistics, Machine Learning, Linear Algebra, CPU and computer architecture

Publications

Journal Articles

> *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**

Conference Articles

> *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.
> SPIE. Apr **2024**

> *Régression locale de la profondeur grâce au flou de défocalisation et à un réseau de neurones entraîné par soft-assignment*.
> R. Leroy, P. Trouvé-Peloux, B. Le Saux, B. Buat et F. Champagnat.
> GRETSI #28. Sep **2022**

> *Pix2Point: Learning Outdoor 3D Using Sparse Point Clouds and Optimal Transport*.
> R. Leroy, P. Trouvé-Peloux, F. Champagnat, B. Le Saux et M. Carvlho.
> Int. Conf. on Machine Vision and Applications (MVA), Oct **2021**

> *Pix2Point: prédiction monoculaire de scènes 3D par réseaux de neurones hybrides et transport optimal*.
> R. Leroy, B. Le Saux, M. Pinheiro Carvalho, P. Trouvé-Peloux et F. Champagnat.
> RFIAP, Oct **2020**

Work Experience

Postdoctoral Researcher - 05/2023 – Present

> Development of a coordinate-based algorithm using Multiplicative Filter Networks for signal compression, applied to conventional and lightfield images
> Investigating methods for generalizing Implicit Neural Representation to multiple signals

Internship ONERA - 03/2019 – 09/2019

> Deep neural networks for Monocular Depth Estimation using 3D Point cloud modality

Internship CEA - 09/2017 – 03/2018

> Iterative regularization of the Kaiser-Squires transformation for dark matter mass mapping

Certificates

Principles of Data Networks - Mines-Telecom Institute (2015)

General Skills

Machine Learning | Object Oriented Programming | Photography | Window/Gnu Linux

Languages

French	**English**	**Korean**	**Japanese**	**German**
Native	Fluent	Novice	Novice	Intermediate