

# Paul Couairon

PHD STUDENT AT SORBONNE UNIVERSITY

Paris, France

☎ (+33)652628188 | ✉ paul.couairon@gmail.com | 🏠 pcouairon.github.io | in paul-couairon

*I am currently pursuing a PhD at Sorbonne University,  
focusing on visual representations in foundation models.*

## Education

### PhD in Computer Science

Paris, France

SORBONNE UNIVERSITY (ISIR, MLIA)

Advisor: Pr. Nicolas Thome

Oct 2022 - Nov 2025

- Manuscript: *Structured Visual Representations with Foundation Models*
- Topics: Foundation Models, Diffusion Models, Representation Learning, Visual Representations Upsampling, Zero-Shot Segmentation, Zero-Shot Video Editing.

### Master of Science, Data Science GPA: 4.0 / 4.0

Palaiseau, France

INSTITUT POLYTECHNIQUE DE PARIS

Sep 2020 - Sep 2021

- Majors: Machine Learning, Optimization, Probability
- Minors: Deep Learning, Statistics, Programming

### Diplôme d'Ingénieur GPA: 3.9 / 4.0

Palaiseau, France

ENSAE PARIS

Sep 2019 - Sep 2021

- Majors: Statistics, Probability, Machine Learning, Optimization
- Minors: Econometrics, Macroeconomics, Microeconomics

### Bachelor of Science, Mathematics and Economics GPA: 4.0 / 4.0

Palaiseau, France

PARIS-SACLAY UNIVERSITY

Sept 2016 - Sept 2019

- Mathematics: Linear Algebra, Convex Optimization, Probability
- Economics: Macroeconomics, Microeconomics, Econometrics

## Research Experience

### CortAix Lab, Thales

Palaiseau, France

PHD STUDENT

Oct 2022 - Oct 2025

- Zero-shot adaptation of visual representations from pre-trained foundation models for video editing, semantic segmentation, depth estimation and related downstream tasks.

### Vision and Robotics Lab, Thales

Palaiseau, France

SOFTWARE ENGINEER

Jul 2022 - Oct. 2022

- Implementation of GAN models for video compression.

### AI Lab, Thales

Palaiseau, France

RESEARCH INTERN

Jul 2021 - Dec. 2021

- Research on deep neural network architectures robust to adversarial attacks.

### Internal Models Group, Crédit Agricole

Montrouge, France

QUANTITATIVE RESEARCH INTERN

Jun 2020 - Sept. 2020

- Operational risk modeling using Bayesian Networks to estimate Value-at-Risk.

## Skills

### • Programming Language:

Python • Shell

### • Packages:

PyTorch • Scikit-Learn • Numpy • Pandas

### • Tools & OS:

Linux • Latex • Git • Jupyter/Colab • Vim • VSCode

### • Languages:

French (native) • English (fluent) • German (beginner)

### • Reviewing:

TMLR • NeurIPS

SEPTEMBER 24, 2025

PAUL COUAIRO

1

## Publications

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### JAFAR: Jack-up Any Feature at Any Resolution

NeurIPS

PAUL COUAIRON, LOÏCK CHAMBON, LOUIS SERRANO, JEAN-EMMANUEL HAUGEARD, MATTHIEU CORD, NICOLAS THOME

2025

### ViLU: Learning Vision-Language Uncertainties for Failure Prediction

ICCV

MARC LAFON, YANNIS KARMIM, JULIO SILVA-RODRÍGUEZ, PAUL COUAIRON, CLÉMENT RAMBOUR, RAPHAËL FOURNIER-SNIEHOTTA, ISMAIL BEN AYED, JOSE DOLZ, NICOLAS THOME

2025

### DiffCut: Catalyzing Zero-Shot Semantic Segmentation with Recursive Normalized Cut and Diffusion Features

NeurIPS

PAUL COUAIRON, MUSTAFA SHUKOR, JEAN-EMMANUEL HAUGEARD, MATTHIEU CORD, NICOLAS THOME

2024

### VidEdit: Zero-Shot and Spatially Aware Text-Driven Video Editing

TMLR

PAUL COUAIRON, CLÉMENT RAMBOUR, JEAN-EMMANUEL HAUGEARD, NICOLAS THOME

2024

### VidEdit: Zero-Shot and Spatially Aware Text-Driven Video Editing

NeurIPS Workshop

PAUL COUAIRON, CLÉMENT RAMBOUR, JEAN-EMMANUEL HAUGEARD, NICOLAS THOME

2023

## Teaching

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### Teacher Assistant

POLYTECH SORBONNE · Master Level · DEEP LEARNING FOR COMPUTER VISION

Fall 2023 / Fall 2024