Thibaut LOISEAU

PhD Student in Computer Vision

□ +33 (0)7 62 98 29 84 ▷ thibaut.loiseau@gmail.com ⓒ Personal Website in LinkedIn ⓒ GitHub



Professional Summary

PhD student specializing in computer vision and deep learning. Passionate about developing innovative solutions for image processing and analysis. Strong background in machine learning and computer vision algorithms.

Education

2023–Present **PhD Student in Computer Vision**, *Ecole Nationale des Ponts et Chaussées*, Champs-sur-Marne, France

- O Thesis: Automatic Semantic Scene Learning for Robust and Accurate Localization
- O Supervisors: Vincent Lepetit and Guillaume Bourmaud
- O Research focus: Computer Vision, Deep Learning, Camera Pose Estimation, 3D Reconstruction

2022–2023 MVA Master (Mathematics, Vision and Learning), ENS Paris-Saclay, Gif-sur-Yvette, France

- Specialization: Computer Vision and Machine Learning
- Relevant courses:
 - Convex optimization and applications in machine learning
 - Learning for time series
 - Models, information, and statistical physics
 - 3D computer vision
 - Object recognition and computer vision
 - Advanced learning for text and graph data
 - Deep learning and signal processing, introduction and industrial applications
 - Deep learning in practice
 - Deep learning for medical imaging
 - The machine intelligence of images

2020-2021 Master's Degree in Nanoscience, Université Paris-Saclay, Palaiseau, France

- Specialization: Nanodevices and Nanotechnology
- Relevant courses:
 - Fabrication and characterization of nanodevices and nanoobjects
 - Nanoelectronics and molecular electronics
 - Terahertz semiconductor components
 - Micro and nanodevices for biology and diagnostics
 - Physics of components

2017–2021 Engineering School, CentraleSupélec, Gif-sur-Yvette, France

- Major: Communicating Systems and Internet of Things
- One of France's top engineering schools, specializing in science and technology
- Relevant courses:
 - Signal processing and communications
 - Big data and mass computing
 - Embedded systems and IoT design
 - Advanced digital systems
 - Algorithms and data structures
 - Probabilities and statistics
 - Wireless systems and networks
 - Project management and software engineering

Projects

2025 AlligatOR: Pre-Training Through Co-Visibility Segmentation for Relative Camera Pose Regression,

- Thibaut Loiseau, Guillaume Bourmaud, Vincent Lepetit
- Developed a novel pre-training approach that reformulates cross-view learning as a co-visibility segmentation task
- Created Cub3, a large-scale dataset with 2.5M image pairs and dense co-visibility annotations from nuScenes
- Demonstrated significant improvements over CroCo in relative pose regression, especially in limited overlap scenarios
- O Achieved interpretable predictions by classifying pixels as co-visible, occluded, or outside FOV

2025 RUBIK: A Structured Benchmark for Image Matching across Geometric Challenges, Thibaut Loiseau, Guillaume Bourmaud,

CVPR 2025 – Main Conference

- Designed a systematic benchmark evaluating image matching methods across 33 geometric difficulty levels
- O Organized 16.5K image pairs using three criteria: overlap, scale ratio, and viewpoint angle
- O Conducted comprehensive evaluation of 14 methods, revealing performance-computation trade-offs
- Identified critical challenges in scenarios combining low overlap, large scale differences, and extreme viewpoints

2024 Reliability in Semantic Segmentation: Can We Use Synthetic Data?,

<u>Thibaut Loiseau</u>, Tuan-Hung Vu, Mickael Chen, Patrick Pérez, Matthieu Cord, ECCV 2024 – Main Conference & Workshop

- Pioneered the use of synthetic data generation for assessing semantic segmentation model reliability
- $_{\odot}$ Developed a Stable Diffusion-based approach for zero-shot generation of OOD scenes and objects
- $\odot\,$ Demonstrated high correlation between synthetic and real-world OOD performance
- $_{\odot}\,$ Enhanced model calibration and OOD detection capabilities through virtual testing

Research Experience

2023 Research Intern, Valeo.ai, Paris, France

- O Developed a novel approach for assessing semantic segmentation model reliability using synthetic data
- Fine-tuned Stable Diffusion to generate out-of-distribution (OOD) scenes and objects for comprehensive model evaluation
- Demonstrated strong correlation between synthetic and real-world OOD performance, validating the approach
- $_{\odot}\,$ Enhanced model calibration and OOD detection capabilities through synthetic data testing
- $\, \odot \,$ Published findings at ECCV 2024 with code and data made publicly available
- $\,\circ\,$ Collaborated with Tuan-Hung Vu, Mickael Chen, Patrick Pérez, Matthieu Cord

2021 Research Intern, C2N, CNRS, Université Paris-Saclay, Palaiseau, France

- Developed energy-efficient deep learning algorithms optimized for spintronic-based hardware (STT-MRAM)
- O Designed novel circuit architecture for on-edge inference, significantly reducing memory requirements
- O Collaborated with Unité Mixte de Physique CNRS/Thales on hardware-software co-design
- Contributed to the development of a spintronic-based random number generator for AI applications

Teaching Experience

2025 Teacher, Ecole Nationale des Ponts et Chaussées, Champs-sur-Marne, France

- \odot Course: "Introduction to C++" to first year students
- O Responsibilities: Giving courses, lab sessions, grading

Languages

English Fluent

French Native

Professional working proficiency