Emery Pierson

PhD in Computer Science and Applied Mathematics

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Computer science researcher working at the intersection of geometry, machine learning, and 3D vision.

Research Experience

Postdoctoral Researcher École Polytechnique — LIX — Jan 2024–Dec 2026 • Palaiseau, France

Generative modeling of non-rigid shapes Developing generative models for non-rigid shapes from raw scans with little or no preprocessing, under the supervision of Maks Ovsjanikov.

Postdoctoral Researcher Lille University Hospital (CHU Lille) — Sep–Dec 2023 • Lille, France

CALYPSO project — Objective measures of depression The aim of the project is to explore the possibility of obtaining objective measures of a patient's depressive state, using multimodal inputs from vision, audio, and physiological data during interviews. During my stay, I designed the collection protocol for a dataset of interviews with 100 hospitalized patients. The project is ongoing, with multiple publications of insights from the collected dataset.

Postdoctoral Researcher University of Vienna — Department of Mathematics — Apr–Jul 2023 • Vienna, Austria

Riemannian shape analysis During my stay, we extended some of my thesis methods to unparameterized shapes including human faces, under the supervision of Martin Bauer. the collaboration resulted in a journal publication (IJCV).

Visiting Scholar Florida State University — Department of Mathematics — Apr 2022 • Tallahassee, USA

Unparameterized human-body scans We worked on extending Riemannian geometry tools for human-body shape analysis with Martin Bauer; the collaboration led to a publication at ICCV 2023.

Education

PhD, Computer Science and Applied Mathematics University of Lille — Jan 2020–Mar 2023 • Villeneuve-d'Ascq, France

3D and 4D human-body surface comparison and deformation Supervised by Mohamed Daoudi and Juan Carlos Álvarez Paiva. Developed methods for comparing and retrieving human bodies and motion, and for deforming and representing high-precision body models.

Master, Mathematics, Vision, Learning (MVA) Université Paris-Saclay — ENS Paris-Saclay — Sep 2018–Sep 2019 • Cachan, France

Selected coursework Computer vision, deep learning, 3D vision, digital imaging, reinforcement learning, game theory, topological data analysis, audio signal analysis.

Master of Engineering, Supélec Curriculum CentraleSupélec — Sep 2015–Jun 2019 • Gif-sur-Yvette, France

Focus Computer science, electrical engineering, and applied mathematics; advanced statistics, stochastic processes, time-series analysis, and convex optimization.

Bachelor, Fundamental and Applied Mathematics Université Paris-Sud — Sep 2015–Jun 2016 • Orsay, France

Publications

Beyond Prompts: Unconditional 3D Inversion for Out-of-Distribution Shapes

Victoria Yue Chen, Emery Pierson, Léopold Maillard, Maks Ovsjanikov

Preprint · 2026 · paper

A Non-Invasive 3D Gait Analysis Framework for Quantifying Psychomotor Retardation in Major Depressive Disorder

Fouad Boutaleb, Emery Pierson, Mohamed Daoudi, Clémence Nineuil, Ali Amad, Fabien D'Hondt

Preprint · 2026 · paper

Beyond ReLU: Bifurcation, Oversmoothing, and Topological Priors

Erkan Turan, Gaspard Abel, Maysam Behmanesh, Emery Pierson, Maks Ovsjanikov

Preprint · 2026 · paper

PatchAlign3D: Local Feature Alignment for Dense 3D Shape Understanding
Souhail Hadgi, Bingchen Gong, Ramana Sundararaman, Emery Pierson, Lei Li, Peter Wonka, Maks Ovsjanikov
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) · 2026 · paper · code · project page

Unfolding Generative Flows with Koopman Operators: Fast and Interpretable Sampling
Erkan Turan, Aristotelis Siozopoulos, Louis Martinez, Julien Gaubil, Emery Pierson, Maks Ovsjanikov
Preprint · 2026 · paper

PaNDaS: Learnable Deformation Modeling with Localized Control
Thomas Besnier, Emery Pierson, Sylvain Arguillère, Maks Ovsjanikov, Mohamed Daoudi
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) · 2026 · paper

Peripheral skin temperature differentiates unipolar and bipolar depression
Ali Amad, Yassine Ouzar, Clémence Nineuil, Fouad Boutaled, Emery Pierson, Fabien D'Hondt, Mohamed Daoudi
Journal of Affective Disorders · 2025 · paper

DiffuMatch: Category-Agnostic Spectral Diffusion Priors for Robust Non-rigid Shape Matching
Emery Pierson, Lei Li, Angela Dai, Maks Ovsjanikov
International Conference on Computer Vision (ICCV) · 2025 · paper · code

Wearable-Derived Behavioral and Physiological Biomarkers for Classifying Unipolar and Bipolar Depression Severity
Yassine Ouzar, Clémence Nineuil, Fouad Boutaled, Emery Pierson, Ali Amad, Mohamed Daoudi
IEEE International Conference on Automatic Face and Gesture Recognition (FG) · 2025 · paper

Measuring Anxiety Levels with Head Motion Patterns in Severe Depression Population
Fouad Boutaled, Emery Pierson, Nicolas Doudeau, Clémence Nineuil, Ali Amad, Mohamed Daoudi
IEEE International Conference on Automatic Face and Gesture Recognition (FG) · 2025 · paper

Basis restricted elastic shape analysis on the space of unregistered surfaces
Emmanuel Hartmann, Emery Pierson, Martin Bauer, Nicolas Charon, Mohamed Daoudi
International Journal of Computer Vision · 2025 · paper · code

BaRe-ESA: A Riemannian Framework for Unregistered Human Body Shapes
Emmanuel Hartmann, Emery Pierson, Martin Bauer, Nicolas Charon, Mohamed Daoudi
International Conference on Computer Vision (ICCV) · 2023 · paper · code

VariGrad: A Novel Feature Vector Architecture for Geometric Deep Learning on Unregistered Data
Emmanuel Hartmann, Emery Pierson
Eurographics Workshop on 3D Object Retrieval (3DOR) · 2023 · paper · code

Toward Mesh-Invariant 3D Generative Deep Learning with Geometric Measures
Thomas Besnier, Sylvain Arguillère, Emery Pierson, Mohamed Daoudi
Computer & Graphics, Special Section 3D Object Retrieval (3DOR) · 2023 · paper

3D Shape Sequence of Human Comparison and Classification Using Current and Varifolds
Emery Pierson, Mohamed Daoudi, Sylvain Arguillère
European Conference on Computer Vision (ECCV) · 2022 · paper · code

Parameterization Robustness of 3D Auto-Encoders
Thomas Besnier, Sylvain Arguillère, Emery Pierson, Mohamed Daoudi
Eurographics Workshop on 3D Object Retrieval (3DOR) · 2022 · paper

A Riemannian Framework for Analysis of Human Body Surface
Emery Pierson, Mohamed Daoudi, Alice-Barbara Tumpach
IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) · 2022 · paper · code

Projection-based classification of surfaces for 3D human mesh sequence retrieval
Emery Pierson, Juan Carlos Alvarez Paiva, Mohamed Daoudi
Computer & Graphics, Special Section Shape Modeling International · 2021 · paper

A frugal approach to music source separation
Emery Pierson, Nathan Souviraà-Labastie
Preprint · 2019 · paper

Teaching & Supervision

Geometric deep learning Teaching assistant Maths, Vision Learning master (MVA) 2024 • PAris, France
Master course Teaching assistant during lab sessions: Introduction to geometric objects, learning on shapes, neural shape representations. Website

Computer Science Teaching assistant Lille University Technological Institute (IUT de Lille) - Computer Science Department 2022 • Lille, France
Undergraduate course Teaching assistant during lab sessions: Introduction to computer sience, object oriented programming, web design. Java, HTML, CSS.

Introduction to basic mathematics Université de Lille 2021 • Lille, France
Undergraduate course Teaching of first years bachelors, and assistance for exercises. Design of midterm exams.

Industry Experience

Research Intern A-Volute Apr–Dec 2019 • Villeneuve-d'Ascq, France
Multi-task learning for music source separation Reproduced state-of-the-art neural source-separation methods and explored multi-task learning improvements.

Engineering Intern Daimler AG Jan–Jul 2018 • Sindelfingen, Germany
Augmented Reality conformance testing Built a test framework for next-generation automotive AR modules, then designed and implemented the test specifications.

Research Intern CEA — French Alternative Energies and Atomic Energy Commission Jul–Dec 2017 • Bruyères-le-Châtel, France
Multimodal satellite image registration Designed and implemented algorithms to register high-resolution satellite imagery with lower-resolution hyperspectral imagery.

Academic Service & Commitments

Program Committee Member 3DOR Symposium 2023, 2025, 2026
Service Program committee membership and peer review. Organizers

Project Contributor ANR Human4D Research Project 2020–2023
Responsibilities Participated in consortium meetings and contributed to project deliverables. Project

Peer Review

- Computers & Graphics, 2023 — *Present*
- IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), 2024
- ACM Transactions on Graphics (TOG), 2025 — *Present*
- Conference on Computer Vision and Pattern Recognition (CVPR), 2026
- International Conference on Machine Learning (ICML), 2026
- European Conference on Computer Vision (ECCV), 2026
- Conference on Neural Information Processing Systems (NeurIPS), 2026
- European Conference on Computer Vision (ECCV) Workshop, 2022

Community Experience

Communications Team Member Supélec Alpha Team Jan–May 2017 • Gif-sur-Yvette, France
Contribution Designed and wrote the communications brochure for CentraleSupélec applicants.

Association Member Supélec Rézo — Sep 2015–Jun 2017 · Gif-sur-Yvette, France

Contribution Helped provide and operate internet service for the school campus.

Invited Talks & Lectures

GeoGen3DHuman Seminar Université de Lille — Nov 2025
Category-Agnostic Priors for Non-rigid Shape Matching

Summer School on Multimodal Foundation Models and Generative AI 2nd edition · INPT, Rabat — Sep 2025
Geometric Deep Learning for Non-rigid Shapes

Young Data Science Seminar ETH Zürich — 20 Jan 2022
Classification of Human Body Surfaces Using Geometrical Invariants

Deep Learning for Three-dimensional (3D) Humans AIDA AI Doctoral Academy · online short course — 17 Jan 2022
3D Human Body and Deep Learning

Technical Profile

Research areas	Geometric deep learning · Non-rigid 3D shape analysis · Generative modeling · Computer vision · Riemannian geometry
Languages	Python · Bash · Java · HTML/CSS
Libraries	PyTorch · PyTorch3D · scikit-learn · Keras · OpenCV · VTK · scikit-image
Platforms	Linux · Windows · Web

Interests

Languages	French (native) · English (fluent) · Japanese · German (beginner, A1)
Sports	Tennis, basketball, and ultimate frisbee
Hobbies	Language learning, including the study of Chinese characters · Cooking · Board games