Alain **Riou**

Personal information

14 Villa du Belvédère,
94800 Villejuif, France

26 years old

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github.com/aRI0U

Computer skills

Programming languages: Python, C++, basics of C, OCaml, Scala, Assembly

Deep learning: PyTorch, SLURM, Hydra, W&B, Lightning, Ray, basics of Tensorflow

Other: Office pack, Git, LaTeX

Languages

French: Native speaker

English: Fluent (C1)

German: Basic knowledge (B1)

Spanish: Basic knowledge (B1)

Japanese: Currently learning (A1-A2)

Miscellaneous

Music: Bass, guitar, piano. I have played for 10+ years and participated in multiple concerts with several bands (rock, jazz, reggae, blues, metal)

Professional experience

2022-now — **Sony Computer Science Laboratories × Télécom Paris, Paris, France** — PhD student
Supervised by Gaëtan Hadjeres, Stefan Lattner and Geoffroy Peeters
My PhD is about self-supervised approaches for learning musical representations. In particular, I mostly worked on equivariant SSL and JEPA-based methods.

2021 — **Institute of Computational Perception, JKU Linz, Austria** — Research Intern
Supervised by Verena Praher and Gerhard Widmer
Analysis of methods to explain neural network predictions (LIME, Remove And Retrain) in music-related tasks, such as voice detection and genre classification.

2020 — **Sony Computer Science Laboratories, Paris, France** — Research Intern
Supervised by Gaëtan Hadjeres
Implementation of deep generative models for symbolic music generation by encoding musical sequences into a latent space to generate variations.

2019 — **Computer Vision Group, Technical University of Munich, Germany** — Research Intern
Supervised by Daniel Cremers, Qadeer Khan, and Patrick Wenzel
Implementation of a deep learning algorithm for camera relocalization based on PointNet/PointCNN, estimating pose from a 3D map of point clouds.

2018 — **Algomus Team, MIS, Amiens, France** — Research Intern
Supervised by Mathieu Giraud and Richard Groult
Development of an algorithm to detect harmonic sequences in symbolic music by embedding groups of notes in a metric space.

Education

2020-2021 — **IRCAM, Sorbonne Université, Paris, France**
M2 Acoustique, Traitement du signal, Informatique Appliqués à la Musique (ATIAM)
Studied musicology, wave physics, machine learning, and signal processing.

2019-2020 — **Ecole Normale Supérieure de Paris-Saclay, Cachan, France**
M2 Mathématiques, Vision et Apprentissage (MVA)
Studied computer vision, machine learning, reinforcement learning, audio signal processing, and 3D modeling.

2017-2019 — **Ecole Normale Supérieure de Paris-Saclay, Cachan, France**
Bachelor of Fundamental Computer Science, MSc of Computer Science
Covered algorithmics, programming, databases, and formal languages, as well as computer vision, robot motion planning, statistical ML, and deep learning.

2015-2017 — **Lycée Janson de Sailly, Paris, France**
Preparatory Classes for French Engineering Schools
Intensive program in mathematics and sciences to prepare for competitive exams.

Publications

[1] A. Riou, S. Lattner, G. Hadjeres, and G. Peeters, "PESTO: Pitch Estimation with Self-supervised Transposition-equivariant Objective," Best Paper Award of the 24th International Society for Music Information Retrieval Conference, Milan, Nov. 2023.

[2] A. Riou, S. Lattner, G. Hadjeres and G. Peeters, "Investigating Design Choices in Joint-Embedding Predictive Architectures for General Audio Representation Learning," in International Conference on Acoustics, Speech, and Signal Processing Workshops (ICASSPW), Seoul, Apr. 2024.

[3] A. Riou, S. Lattner, G. Hadjeres, M. Anslow, and G. Peeters, "Stem-JEPA: A Joint-Embedding Predictive Architecture for Musical Stem Compatibility Estimation," in Proceedings of the 25th International Society for Music Information Retrieval Conference, San Francisco, Nov. 2024.

[4] A. Riou, A. Gagneré, G. Hadjeres, S. Lattner, and G. Peeters, "Zero-shot Musical Stem Retrieval with Joint-Embedding Predictive Architectures," Under review for ICASSP 2025, Sep. 2024.