

## Position

### Assistant Professor

September 2023 – ...

IMT ATLANTIQUE / LAB-STICC – BRAIN TEAM

Brest, France

- Research domain Signal Processing, Machine & Deep Learning, Multi-linear Algebra, Low-Rank Factorization, Audio and Music
- Teaching Artificial Intelligence, Programming.

## Diplomas

### Ph.D.

October 2019 - December 2022

IRISA / UNIV. RENNES 1 – PANAMA TEAM

Rennes, France

- Domain Signal Processing (“Signal, Image, Vision”)
- Title Unsupervised Machine Learning paradigms for the representation of music similarity and structure.
- Supervision Jérémy E. COHEN, Frédéric BIMBOT
- Mots-clés Music Structure Analysis; Unsupervised Machine Learning; Numerical Optimization; Music Information Retrieval
- Online resource <https://hal.science/tel-03937846>

### Research Master's degree

2018 - 2019

INSA RENNES / UNIV. RENNES 1

Rennes, France

- Domain Machine and Deep Learning
- Title Multi-channel automatic music transcription using tensor algebra.
- Supervision Jérémy E. COHEN, Nancy BERTIN
- Online resource <https://hal.science/hal-03301448>

### Engineering School

2015 - 2018

MINES DOUAI (BECAME IMT NORD-EUROPE SINCE)

Douai, France

- Domain Computer Science

### Engineering School - International Exchange

September 2017 - January 2018

POLYTECHNIQUE MONTRÉAL

Montréal, Canada

- Domain Computer Science

### “Classes Préparatoires aux Grandes Ecoles”

2013 - 2015

DUPUY DE LÔME HIGH SCHOOL

Lorient, France

- Domain MPSI/MP (Mathematics)

### Scientific Baccalaureate (A-levels)

2013

SAINT-LOUIS HIGH SCHOOL

Lorient, France

- Mention “Bien” – European English

### “BAFA” (French diploma of youth worker)

2014-2015

ECLAIREURS DE FRANCE

Lorient, France

## Industrial Work Experience

### Final Engineering School Internship

February - July 2018

SOPRA STERIA

Rennes, France

- Main mission Innovation in Telecom (agile environment).
- Job objectives
  - ◊ Design and development of prototypes aimed at Telecom business (Augmented Reality, Machine Learning, Blockchain, ...),
  - ◊ Implementation of the technical environment (continuous integration).

## Engineer Assistant Internship

May - August 2017

INFOVISA

Lorient, France

- Main mission Web development.
- Job objectives
  - ◊ Development (in Java/J2EE) of a middleware between a distributed application and several WebServices,
  - ◊ Deployment of the solution with a precise documentation.

## Technician Internship

May - August 2018

BLUE SOLUTIONS, BOLLORÉ GROUP

Quimper, France

- Main mission Assistance to engineers and technicians in machine quality-control and maintenance.
- Job objectives
  - ◊ Development of quality-control VBA macros,
  - ◊ SolidWorks designs and assemblies,
  - ◊ Day-to-day assistance to the installation of a lithium extruder.

## Skills

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**Languages** French (mother's tongue); English (bilingual, TOEIC : 950/990 in 2015); Spanish (Intermediate).

**Programming languages** Python, Java, SDK Android, HTML5/CSS/SQL/JavaScript, C (notions).

**Machine and Deep Learning toolboxes** PyTorch, scikit-learn, Tensorly.

**Operating systems** Linux, Windows

**Music** Drums (15 years of practice); Bass (4 years of practice); Piano (Beginner).

## Publication list

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### International Journal

- Under Review
  - ◊ **A. Marmoret**, J.E. Cohen, F. Bimbot. "Convolutional Block-Matching Segmentation Algorithm for Autosimilarity Matrices, with Application to Music Structure Analysis". Submitted in : *Transactions of the International Society for Music Information Retrieval*.

### International Conferences and Workshops

- Published
  - ◊ **A. Marmoret**, J.E. Cohen, F. Bimbot. "Convolutional Block-Matching Segmentation Algorithm with Application to Music Structure Analysis". In *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics, WASPAA, 2023*.
  - ◊ **A. Marmoret**, J.E. Cohen, F. Bimbot. "Barwise Compression Schemes for Audio-Based Music Structure Analysis". In *19th Sound and Music Computing Conference, SMC, 2022*.
  - ◊ H. Wu, **A. Marmoret**, J.E. Cohen. "Semi-Supervised Convolutional NMF for Automatic Piano Transcription". In *19th Sound and Music Computing Conference, SMC, 2022*.
  - ◊ **A. Marmoret**, J.E. Cohen, N. Bertin, F. Bimbot. "Uncovering Audio Patterns in Music with Nonnegative Tucker Decomposition for Structural Segmentation". In *21st International Society for Music Information Retrieval, ISMIR, 2020*.

### National (French) Conference

- Published
  - ◊ **A. Marmoret**, F. Voorwinden, V. Leplat, J.E. Cohen, F. Bimbot. "Nonnegative Tucker Decomposition with Beta-divergence for Music Structure Analysis of audio signals". In *Groupe de Recherche et d'Etudes de Traitement du Signal et des Images, GRETSI, 2022*.

## Open-Source Toolboxes

- `nn_fac`      <https://github.com/ax-le/nn-fac>
  - ◊ Toolbox of nonnegative factorization techniques, for both matrices (NMF) and tensors (NN-CP, NN-PARAFAC2 and NTD).
  - ◊ These decompositions are computed by solving NNLS (NonNegative Least Squares) problems on every factor when optimizing with respect to the Euclidean norm, or with Multiplicative Updates subject to each factor when optimizing the Beta-divergences.
- `as_seg`      [https://github.com/ax-le/as\\_seg](https://github.com/ax-le/as_seg)
  - ◊ Toolbox containing segmentation algorithms for autosimilarity matrices, in particular the CBM (Convulsive Block Matching) algorithm.
  - ◊ The toolbox contains tutorial and experimental Notebooks, showcasing its mode of operation and experimental results.
- `BarMusComp`      <https://github.com/ax-le/BarMusComp>
  - ◊ Code related to linear and non-linear barwise music compression, then used for music segmentation.
  - ◊ The toolbox encapsulates all data processing necessary for barwise music compression and segmentation, and contains tutorial and experimental Notebooks, showcasing its mode of operation and experimental results.
- `MusicOnPolytopes`      <https://github.com/ax-le/MusicOnPolytopes>
  - ◊ Code associated with the polytopical framework, used as a structural segmentation criterion for symbolic music.
  - ◊ See our preprint “Polytopic Analysis of Music” (arXiv :2212.11054) for more details.

## Scientific Events Organization

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### Scientific vulgarization – Pint of Science

*Des Machines Mélomanes : l'Intelligence Artificielle permet-elle de développer des machines qui comprennent la musique ?*

May 2023

Rennes, France

### Seminar – BRAIn Team – IMT Atlantique

*Low-Rank Factorization for the Representation of Music Similarity and the Estimation of Structure.*

March 2023

Brest, France

### Seminar – Center for Digital Music – Queen Mary University

*Unsupervised Barwise Music Compression for Pattern Uncovering and Structural Segmentation.*

March 2022

London, United-Kingdom

### Scientific vulgarization – Univ. Rennes 1

*Journée Science et Musique.*

October 2019 & October 2021

Rennes, France