MARMORET Axel

Born 02/14/1997 (25 years old)

PhD student (3rd year) in Signal Processing and Machine Learning,

Mines Douai graduated Engineer (computer engineering).

CONTACT

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LANGUAGES

English: Bilingual (TOEIC : **950/990**)
Spanish: Intermediate

COMPUTING SKILLS

- Python ●●●●●
- Java ●●●●●
- SDK Android ●●●●○
- Shell Linux ●●●●○
- HTML5/CSS ●●●○○
- SQL/NoSQL ●●●○○
- PHP ●●●○○
- JavaScript ●●●○○
- C, C++ ●●○○○
- Excel VBA ●●○○○
- OpenGL ●○○○○

INTERESTS

Music: played instruments:
- Drums (since 15 years),
- Bass (since 4 years).

Sport: running, football, surf.

School clubs:
- Vice president of the Arts Bureau,
- Integration committee (CAPA),
- "Cinéclub" (Movie committee),
- Music committee,
- "Cartel des Mines" committee – Delegation of Douai (sport event).

PHD

University of Rennes 1 - IRISA   (www.irisa.fr/en)

2019 - 2022: Signal Processing, under the supervision of Frédéric BIMBOT, Nancy BERTIN and Jérémy E. COHEN - PANAMA team.

« Machine Learning paradigms for multiscale representations of music similarity and structure ».

EDUCATION

University of Rennes 1 & INSA   (master.irisa.fr)

2018 - 2019: Research master's degree in computer science - Machine & Deep Learning.

Polytechnique Montréal - Canada   (www.polymtl.ca/en)

August - December 2017: Computer engineering.

Mines Douai School - newly IMT Nord Europe (imt-nord-europe.fr/en)

2015 - 2018: Computer engineering (course named "ISIC").

"Classes Préparatoires aux Grandes Ecoles"   (cpgedupuydelome.fr)

2013 - 2015: MPSI - MP, Dupuy De Lôme High School, Lorient (56).
2013: Scientific Baccalaureate (A-levels), Lorient (56).

WORK EXPERIENCE

Research Internship - PANAMA team   (team.inria.fr/panama)
Inria/IRISA, Rennes: February - June 2019

- Extending Nonnegative Matrix Factorization (NMF) techniques for automatic music transcription to multichannels signals with tensor algebra (NN-PARAFAC notably).

Engineer Internship - Innovation in Telecom (www.soprasteria.com/en)
Sopra Steria, Rennes: February - July 2018

- Design and development of prototypes aimed at Telecom business (Augmented Reality, Machine Learning, BlockChain, ...),
- Implementation of the technical environment.

Engineer Assistant Internship - Developer   (www.infovisa.fr)
Infovisa, Lorient: May - August 2017

- Development of a middleware between a distributed application and several WebServices.

Technician Internship   (www.blue-solutions.com/en)
Blue Solutions, Bolloré Group, Quimper: May - August 2016

- Development of quality-control VBA macros,
- SolidWorks designs and assemblies.

Musical events organization

- "Mai du Son" Festival (Ploemeur, 2012, 2013, 2014),
- "l'Art Scène" Festival (Douai, within Mines Douai School, 2016, 2017).
- "Journée Science et Musque" (scientific vulgarization, 2021, jsm.irisa.fr)

"BAFA" (French diploma of youth worker) (www.eedf.fr)
Eclaireurs de France: 2014 - 2015.

PUBLICATIONS

ACCEPTED

Uncovering Audio Patterns in Music with Nonnegative Tucker Decomposition for Structural Segmentation - Conference Publication

A. Marmoret, J.E. Cohen, N. Bertin, and F. Bimbot. In *21st International Society for Music Information Retrieval,* ISMIR, 2020.

https://hal.archives-ouvertes.fr/hal-02928733

Barwise Compression Schemes for Audio-Based Music Structure Analysis - Accepted at Sound and Music Computing 2022 conference

A. Marmoret, J.E. Cohen, F. Bimbot. arXiv preprint arXiv:2202.04981.

https://hal.archives-ouvertes.fr/hal-03600873

Semi-Supervised Convolutive NMF for Automatic Piano Transcription - Accepted at Sound and Music Computing 2022 conference

H. Wu, A. Marmoret, J.E. Cohen. arXiv preprint arXiv:2202.04989.

https://hal.archives-ouvertes.fr/hal-03608497

PRE-PRINTS

Nonnegative Tucker Decomposition with Beta-divergence for Music Structure Analysis of audio signals

A. Marmoret, F. Voorwinden, V. Leplat, J.E. Cohen, F. Bimbot. arXiv preprint arXiv:2110.14434.

https://hal.archives-ouvertes.fr/hal-03409508

CODES

nn_fac - Python

Toolbox of nonnegative factorization methods. It contains matrix methods (NMF) and tensor methods (NN-PARAFAC/NN-PARAFAC2/NTD).
These factorization techniques are solved with the HALS or the MU update rules, and solve the problem optimizing the Euclidean norm or the beta-divergences.

https://gitlab.inria.fr/amarmore/nonnegative-factorization

autosimilarity_segmentation - Python

Code used to segment autosimilarity matrices with the Convolutive Block-Matching algorithm.

https://gitlab.inria.fr/amarmore/autosimilarity_segmentation

MusicNTD / MusicAE / BarwiseMusicCompression - Python

Codes used to analyze music (as audio signals) in the different compression schemes, which will soon be fused in one large toolbox code.

https://gitlab.inria.fr/amarmore/{...}

MusicOnPolytopes - Python

Code analyzing music relations through a "polytopic" paradigm.
This work is based upon older development in my research team, and more details can be found at https://ax-le.github.io/polytopes.html.

https://gitlab.inria.fr/amarmore/musiconpolytopes

TEACHING

Teaching assistant - University of Rennes 1

Master 1 MIAGE, *Advanced Database (OLAP, NoSQL: Apache Pig, Spark, Neo4j)*, 2020, 32h.

Teaching assistant - ENSAI

Master 1 and 2 - *High-Scale Statistical Learning and Recommendation System*, 2022, 12h.

SUPERVISION

Master 2 Internship - Computer Science - Florian VOORWINDEN

Co-supervised with Jérémy E. COHEN - *Metrics and representations for Nonnegative Tucker Decomposition applied in music structure inference*, Feb-June 2021