# Arthur Marmin
# Curriculum Vitae

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## DOCTORAL RESEARCH

**"Rational models optimized exactly for solving signal processing problems"** [link]

My research interest is in convex optimization and polynomial optimization and their application to signal processing.

- I have worked on the application of Lasserre's hierarchy on several signal processing problems where structures can be leveraged to alleviate the computational complexity.
- I have developed algorithms to solve large-scale SDP problems.
- I have studied the connection between polynomial optimization, tensor decomposition and the moment problem.

## WORK EXPERIENCE

FEBRUARY 2021 — NOW

Signals and Communication Team, IRIT, Toulouse
**CNRS Post-doctorate Researcher**

APRIL 2015 — APRIL 2017

Industrial Technology Research Institute, Taiwan
**Research Engineer**

I worked at the System and Architecture Design department:

- I modelled the power consumption and performance of embedded GPU and wrote OpenGL and Vulkan benchmarks.
- I took part in the development of a collaborative software platform for SoC, EDA and IP designers to perform early power and performance analysis and validation. The software is based on SystemC/TLM hardware model and a modified version of Qemu to run Android.
- I implemented image rendering techniques on FPGA to reduce the motion-to-photon delay inside virtual reality devices.

JULY — SEPTEMBER 2012

TeamWork Vietnam, Vietnam
**SAP administrator**

## TEACHING EXPERIENCE

SPRING SEMESTER 2020

CentraleSupélec, France
**Optimization (2$^{nd}$ year)**

OCTOBER 2017 — JUNE 2020

CentraleSupélec, France
**Reinforcement classes in mathematics**

FALL SEMESTER 2014

National Chiao Tung University, Taiwan
**Embedded System Design (Graduate class)**

## EDUCATION

| DEC. 2020 | **Doctor of Philosophy in Signal Processing** |
| | Centre de Vision Numérique |
| | Advisors: Jean-Christophe Pesquet, Marc Castella |
| OCT. 2017 | *Université Paris-Saclay, CentraleSupélec* |
| JAN. 2015 | **Master of Science** |
| | Electrical Engineering and Computer Science |
| | Advisor: Shiao-Li Tsao |
| | Thesis: Design and Implementation of an |
| | Embedded GPU Simulator |
| SEP. 2013 | *National Chiao Tung University, Taiwan* |
| JAN. 2015 | **Engineer Diploma in Telecommunication** |
| SEP. 2011 | *Télécom SudParis* |

## COMPUTER SKILLS

| PROGRAMMING | C++, Assembly Languages, Python, LISP |
| HARDWARE DESIGN | Verilog, VHDL, SystemC, TLM |
| API | OpenGL, OpenCL, Qt, mlpack, Linux kernel |
| SOFTWARE | Matlab, GloptiPoly, Tensorlab, Xilinx Vivado Design suite, Git, Doxygen, Emacs |

## LANGUAGE SKILLS

| FRENCH | Mother tongue |
| ENGLISH | Fluent, working operational |
| MANDARIN | Good working knowledge |
| | Used in daily life and working environment |
| GERMAN | Good working knowledge |

## EXTRA INFORMATION

- I have reviewed articles for IEEE Transactions on Signal Processing.
- I was a visitor at Gdansk University of Technology under the supervision of Anna Jezierska in January 2020.

# PUBLICATIONS

## *Journal articles*

1. Arthur Marmin, Marc Castella, Jean-Christophe Pesquet, and Laurent Duval. Sparse signal reconstruction for nonlinear models via piecewise rational optimization. *Signal Process.*, 179:107835, February 2021. doi: 10.1016/j.sigpro.2020.107835.

2. Arthur Marmin, Anna Jezierska, Marc Castella, and Jean-Christophe Pesquet. Global Optimization for Recovery of Clipped Signals Corrupted With Poisson-Gaussian Noise. *IEEE Signal Process. Lett.*, 27:970–974, May 2020. doi: 10.1109/lsp.2020.2998699.

3. Marc Castella, Jean-Christophe Pesquet, and Arthur Marmin. Rational Optimization for Nonlinear Reconstruction with Approximate $\ell_0$ Penalization. *IEEE Trans. Signal Process.*, 67(6):1407–1417, March 2019. doi: 10.1109/tsp.2018.2890065.

## *Conference articles*

4. Elie Leroy, Arthur Marmin, Marc Castella, and Laurent Duval. Weight Identification Through Global Optimization in a New Hysteretic Neural Network Model. In *Proc. Int. Conf. Acoust. Speech Signal Process.* IEEE, June 2021. doi: 10.1109/icassp39728.2021.9413383.

5. Arthur Marmin, Marc Castella, and Jean-Christophe Pesquet. Globally Optimizing Owing to Tensor Decomposition. In *Proc. European Signal Processing Conference*, pages 990–994. IEEE, January 2021. doi: 10.23919/eusipco47968.2020.9287511.

6. Arthur Marmin, Marc Castella, and Jean-Christophe Pesquet. Robust Reconstruction with Nonconvex Subset Constraints: A Polynomial Optimization Approach. In *IEEE Int. Workshop Mach. Learn. Signal Process.* IEEE, September 2020. doi: 10.1109/mlsp49062.2020.9231524.

7. Arthur Marmin, Marc Castella, and Jean-Christophe Pesquet. A Moment-Based Approach for Guaranteed Tensor Decomposition. In *Proc. Int. Conf. Acoust. Speech Signal Process.*, pages 3927–3931. IEEE, May 2020. doi: 10.1109/icassp40776.2020.9054186.

8. Arthur Marmin, Marc Castella, and Jean-Christophe Pesquet. Detecting the Rank of a Symmetric Tensor. In *Proc. European Signal Processing Conference*, pages 1–5. IEEE, September 2019. doi: 10.23919/eusipco.2019.8902781.

9. Arthur Marmin, Marc Castella, and Jean-Christophe Pesquet. Sparse Signal Reconstruction with a Sign Oracle. In *Proc. Signal Processing with Adaptive Sparse Structured Representations (SPARS) workshop*, July 2019.

10. Arthur Marmin, Marc Castella, and Jean-Christophe Pesquet. How to Globally Solve Non-convex Optimization Problems Involving an Approximate $\ell_0$ Penalization. In *Proc. Int. Conf. Acoust. Speech Signal Process.*, pages 5601–5605. IEEE, May 2019. doi: 10.1109/icassp.2019.8683692.

11. Arthur Marmin, Marc Castella, Jean-Christophe Pesquet, and Laurent Duval. Signal Reconstruction from Sub-sampled and Nonlinearly Distorted Observations. In *Proc. European Signal Processing Conference*, pages 1970–1974. IEEE, September 2018. doi: 10.23919/eusipco.2018.8553174.

12. Arthur Marmin, Chun-Hung Lai, Haruyuki Tago, Hsun-Lun Huang, and Juin-Ming Lu. Architecture agnostic energy model for GPU-based design. In *2016 International Symposium on VLSI Design, Automation and Test (VLSI-DAT)*. IEEE, April 2016. doi: 10.1109/vlsi-dat.2016.7482557.