

CV

Mathieu Léonardon

Ph.D. in Electronics
website: mathieuleonardon.com

225 Cours Aimé Césaire
29200 Brest, France
e-mail: mathieu.leonardon@imt-atlantique.fr
phone: (+33)6 88 62 06 03
32 y.o.

Professional Experience

- 2020 - 2020** **Associate Professor**, *IMT Atlantique, Brest*
- **Field:** Electrical Engineering
 - **Subject:** Signal Processing Systems, AI, Algorithm-Architecture Adequation
- 2018 - 2019** **Teaching Assistant**, *Bordeaux INP, IMS Laboratory, Talence*
- **Supervisors:** Christophe Jégo (IMS), Camille Leroux (IMS)
 - **Subject:** Software and hardware implementations of polar decoding algorithms
 - **Teaching:** 192 hours at Bordeaux INP Engineering School
- 2012-2015** **Apprentice Engineer**, *Worldcast Systems, Mérignac*
- **Supervisor:** Hervé Garat
 - **Main project:** Specification, design and development of a man-machine interface
 - **Side project:** Board design and microcontroller programming for FM transmitters
- 2012** **Internship**, *I3S, Laroque-d'Olmes*
- **Supervisor:** Nicolas Antini and Franck Dedieu
 - **Subject:** Design of an electronic gauge with display for measuring oil volume in tankers with a differential pressure sensor.

Education

- 2015 - 2018** **PhD Student in Electronics**,
Université de Bordeaux, IMS Laboratory, France,
Polytechnique Montréal, Electrical Engineering Department, Canada
- **Title:** Polar decoding on programmable architectures.
 - **Keywords:** Polar Codes, Software decoder, ASIP, Algorithm-Architecture Adequation
 - **Defense date:** December 13, 2018
 - **Jury:**

Pr. Mohamad Sawan	Polytechnique Montréal	President
Pr. Amer Baghdadi	IMT Atlantique	Member
Pr. Emmanuel Casseau	Université Rennes 1	Member
Dr. Olivier Muller	Grenoble INP	Member
Pr. Charly Poulliat	INP Toulouse	Member
Dr. Camille Leroux	Bordeaux INP	Supervisor
Pr. Christophe Jégo	Bordeaux INP	Director
Pr. Yvon Savaria	Polytechnique Montréal	Director
- 2012 - 2015** **Engineer Degree**, *Bordeaux INP, Talence, France*
- Embedded Electronics Systems (SEE), Apprenticeship
- 2011 - 2012** **University Diploma of Technology**, *IUT Paul Sabatier, Toulouse, France*
- Physical Measures

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AREAS OF EXPERTISE

Research themes

- *Signal processing*, digital communication chain, multiple access techniques, digital modulation
- *Algorithm-Architecture Adequacy*
- *Channel coding*: polar codes, LDPC codes, Turbocodes, algebraic codes
- *High-performance computing on general purpose processors*: SIMD, SMT, multinodes
- *Dedicated hardware architectures*: Xilinx design flow & Intel FPGA
- *ASIP Architectures*: Tensilica design flow, TCE (TTA-based Co-design Environment)
- *Software engineering*: object-oriented programming, continuous integration, versioning

Communications

- *Teaching* engineers
- *Writing* scientific articles in French and English
- *Talking* at national and international conferences
- *Languages*: French (mother tongue), English (TOEIC 975) and German (elementary)

Tools

- *Operating systems*: Linux/Unix (preferred), Windows
- *Programming languages*: C/C++ (STL, Pthreads, OpenMP, MPI), JAVA, Python
- *Software*: Matlab, LaTeX, Office, Git, Vivado, Quartus

PUBLICATIONS

- **Manuscript**

- [M1] **M. Léonardon**, “Décodage de Codes Polaires sur des Architectures Programmables”, PhD thesis, Université de Bordeaux and Polytechnique Montréal, 2018.

- **International Journals**

- [IJ1] A. Cassagne, O. Hartmann, **M. Léonardon**, *et al.*, “AFF3CT: a Fast Forward Error Correction Toolbox!”, *SoftwareX*, 2019 (to be published).
- [IJ2] A. Ghaffari, **M. Léonardon**, A. Cassagne, C. Leroux, and Y. Savaria, “Toward High Performance Implementation of 5G SCMA Algorithms”, *IEEE Access*, 2018. DOI: [10.1109/ACCESS.2019.2891597](https://doi.org/10.1109/ACCESS.2019.2891597).
- [IJ3] **M. Léonardon**, A. Cassagne, C. Leroux, C. Jégo, L.-P. Hamelin, and Y. Savaria, “Fast and Flexible Software Polar List Decoders”, *Springer Journal of Signal Processing Systems (JSPS)*, 2019. DOI: [10.1007/s11265-018-1430-3](https://doi.org/10.1007/s11265-018-1430-3).

- **International Conferences**

- [IC1] A. Cassagne, O. Hartmann, **M. Léonardon**, T. Tonnellier, G. Delbergue, C. Leroux, R. Tajan, B. Le Gal, C. Jégo, O. Aumage, and D. Barthou, “Fast Simulation and Prototyping with AFF3CT”, in *International Workshop on Signal Processing Systems (SiPS)*, IEEE, 2017.
- [IC2] A. Ghaffari, **M. Léonardon**, Y. Savaria, C. Jégo, and C. Leroux, “Improving Performance of SCMA MPA Decoders using Estimation of Conditional Probabilities”, in *International Conference on New Circuits and Systems (NEWCAS)*, 2017. DOI: [10.1109/NEWCAS.2017.8010095](https://doi.org/10.1109/NEWCAS.2017.8010095).
- [IC3] **M. Léonardon**, C. Leroux, D. Binet, J. P. Langlois, C. Jégo, and Y. Savaria, “Custom Low Power Processor for Polar Decoding”, in *International Symposium on Circuits and Systems (ISCAS)*, IEEE, 2018. DOI: [10.1109/ISCAS.2018.8351739](https://doi.org/10.1109/ISCAS.2018.8351739).
- [IC4] **M. Léonardon**, C. Leroux, P. Jääskeläinen, C. Jégo, and Y. Savaria, “Transport Triggered Polar Decoders”, in *International Symposium on Turbo Codes and Iterative Information Processing (ISTC)*, IEEE, 2018. DOI: [10.1109/ISTC.2018.8625310](https://doi.org/10.1109/ISTC.2018.8625310).

- **French Conference**

- [NC1] A. Cassagne, **M. Léonardon**, O. Hartmann, T. Tonnellier, G. Delbergue, V. Giraud, C. Leroux, R. Tajan, B. Le Gal, C. Jégo, O. Aumage, and D. Barthou, “AFF3CT : un Environnement de Simulation pour le Codage de Canal”, in *GdR SoC2*, 2017.
- [NC2] **M. Léonardon**, C. Leroux, P. Jääskeläinen, C. Jégo, and Y. Savaria, “Décodeurs de codes polaires déclenchés par transfert de donnée”, in *GRETSI*, 2019.

RESPONSABILITIES

I have been an IEEE member since 2018 and I participate in the review of articles for various journals and conferences in the field of digital systems and signal processing.

- **Revue d'articles de journaux**

- IEEE Communication Letters

- **Revue d'articles de conférence**

- IEEE International Symposium on Information Theory: ISIT
- IEEE Wireless Communications and Networking Conference: WCNC
- IEEE International Conference on Communications: ICC
- IEEE Workshop on Signal Processing Systems: SiPS
- IEEE International New Circuits and Systems Conference: NewCAS

- **CCT TSI CNES**

In June 2015, I participated in the "Technologies for 5G - Space Segment" day organized by CNES in Toulouse, for a presentation called "Polar codes, algorithms and decoders", during which I was able to exchange with the various speakers.