

# Gaëtan FRUSQUE

Doctor and engineer.

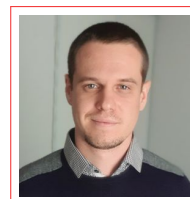
Fascinated by signal processing and data science.

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Driving licence: Permis B



## Skills

**Autonomy and decision making:** was the driving force behind the development of new methods, highly autonomous during the thesis.

**Adaptability:** shows an ability to be quickly operational in different environments, international experiences.

**Curiosity and creativity:** loves to acquire new knowledge and solve problems.

**Communication:** published several scientific articles, gave oral presentations in conferences and workshops, taught in engineering school (see the CV appendix).

## Experiences

- 2017–2020 **ENS Lyon**, PhD: Inference and decomposition of dynamical graphs, application in neuroscience. .
- Development of dynamical graphs processing tools. Works accepted in journals/conferences in signal processing and machine learning (IEEE transaction, ICASSP ...).
  - Achievement of a method to extract the pathological cortical networks of an epileptic seizure from sEEG signals. Works accepted in a clinical journal (Frontiers in neurology).
- 02-07 2017 **CEA/Gipsa-Lab**, Grenoble, internship in statistics and bioinformatics.
- Genes identification using a bayesian *a priori* (in the form of directed graph).
- 05-08 2016 **King Abdullah Univ. of Science and Technology**, Saudi Arabia, research internship.
- Theoretical work on the use of the Schrödinger operator to decompose complex signals.
- 06-07 2015 **Humanitarian project**, *Solida'rire*, Sokone, Senegal.
- Fundraising during the year 2014/2015, masonry work, restoration of a sanitary block.

## Formation

- 2017–2020 **PhD in computer science and applied mathematics**, *LIP, ENS Lyon*.
- Unsupervised learning, time series processing, graph inference, parsimony, optimisation.
- 2016–2017 **Master Artificial Intelligence, Erasmus**, *KU Leuven*, Belgium.
- One-semester Erasmus exchange, courses in machine learning and computer science.
- 2015–2017 **Master Signal, Image, Communication and Multimedia**, *Grenoble INP Phelma*.
- Signal processing, applied mathematics, programming, electronics.
- 2012–2014 **Prepa PTSI/PT\* (specialisation in industrial science)**, *Lycée déodat de Séverac*, Toulouse.
- National competitive examination for admission to the French "Grandes Ecoles".

## Programming

Main	Python, Matlab, R, C.
Studied	SQL, Prolog, Java, VHDL.
Tools	Git, Unix, Latex, suite office

## Language

Vernacular	French
Operational	English
Notions	Spanish

## Interests

Guitar (11 years), classical and world music, cycling, video games and board games.

## Appendix

### International journals with peer review

- 03 2020 Multiplex network inference with sparse tensor decomposition for functional connectivity - Gaëtan Frusque, Julien Jung, Pierre Borgnat, Paulo Gonçalves - IEEE transaction T-SIPN
- 09 2020 Semi-automatic extraction of functional dynamic networks describing patient's epileptic seizures Gaëtan Frusque, Pierre Borgnat, Paulo Gonçalves, Julien Jung - Frontiers in Neurology

### International conferences with reading committee and publication of proceedings

- 01 2020 Regularized partial phase synchrony index applied to dynamical functional connectivity estimation Gaëtan Frusque, Julien Jung, Pierre Borgnat, Paulo Gonçalves - ICASSP 2020
- 02 2020 Temporarily activated patterns for multi-trial functional connectivity data - Gaëtan Frusque, Pierre Borgnat, Paulo Gonçalves - ASPAI'2020
- 09 2019 Pattern extraction in multi-trial dynamical graphs of functional connectivities - Gaëtan Frusque, Julien Jung, Pierre Borgnat, Paulo Gonçalves - Wavelets and Sparsity XVIII

### French conferences with reading committee and publication of proceedings

- 09 2019 Réduction de dimension tensorielle parcimonieuse: Application au clustering de connectivité fonctionnelle - Gaëtan Frusque, Julien Jung, Pierre Borgnat, Paulo Gonçalves - 27ème édition du colloque GRETSI

### Workshop and conferences without publication of proceedings

- 10 12 2020 Conference on complex system 2020, CCS2020
- 25 09 2019 GdR ISIS conference day "Signal processing over graphs, with a focus on neuroscience data"
- 17 06 2019 GdR ISIS conference day "New tensor methods and applications"
- 06 2018 3rd Graph Signal Processing Workshop, GSP'18, EPFL - Poster presentation
- 10 2018 21st French Epilepsy Days, JFE Lyon 2018 - Poster presentation

### Notable training courses followed during the thesis

- 10 2020 GdR MIA conference day "Sparse and non-convex optimization"
- 09 2018 23ième Ecole d'été de Peyresq - Deep learning and signal processing on graph
- 07 2018 GraphSIP: Signal processing on graphs, applications in neuroscience
- 05 2018 Doctoriales 2018 : A fresh look at the challenges of innovation - 3 days of auditing and business advice
- 12 2018 One week internship in Brest - IMT Atlantique with Nicolas Farrugia

### Teachings

- 60 h Random signal processing (M1 level): Estimation, Bias variance trade-off, Quadratic detection, Optimal linear filtering
- 28 h Optimisation (M1 level): Convex, non-smooth and constrained optimisation
- 24 h Digital signal processing (L3 level): TFD, FIR filtering, RII filtering
- 16 h Data Mining (M1 level): Python, Machine learning, Deep learning
- 16 h Signals and linear systems (L3 level): Sampling, Correlation
- 4 h Speech processing (M2 level)