Cédric **Rommel**

Chief Machine Learning Scientist at Ava

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Research Interests

Main fields of application: Trajectory Optimization, System Identification, Speaker Diarization
Reinforcement Learning: Model-based (optimal control, HJB, dynamic programming) and model-free (yet unexplored).
Supervised Learning: RNNs, Functional data, Multi-task/Multi-output learning, feature selection, kernel methods.
Unsupervised Learning: Density estimation, Online clustering.
Optimization: First order methods, nonsmooth functions, nonconvex optimization, alternating minimization.

Education

INRIA | École Polytechnique | Université Paris Saclay
Paris, France

PhD in Machine Learning and Optimal Control — *Nov. 2015 - Oct. 2018*

- CIFRE contract with company Safety Line,
- Hosted by the CMAP laboratry of École Polytechnique (Centre de Mathématiques Appliquées),
- Defended thesis at École Polytechnique.

MINES ParisTech
Paris, France

Master of Science and Engineering — *Sep. 2011 - Jun. 2015*

- Main courses: Probability Theory, Data Analysis, Statistics, Control Theory, Optimization, Signal Processing, Operations Research.

Lycée HOCHE
Versailles, France

Preparatory School — *Sep. 2009 - Sep. 2011*

- Special preparatory classes leading to the competitive examination for the top series of French engineering schools.
- Ranked 40th out of 3502 competitors.

Lycée Pasteur
Sao Paulo, Brazil

French Scientific Baccalaureate with 1st class honors — *Nov. 2008*

- Major : Mathematics and Physics.

Experience

Reviewer
Paris, France

In Model-based Reinforcement Learning and Speech Recognition — *Nov. 2018 - Today*

- NeurIPS 2019, ICML 2020

Ava Accessibility
Paris, France

Chief Scientist — *Nov. 2018 - Today*

- Research and engineering in the speech processing field.
- Main topics include: real-time speaker diarization with multiple channels using recurrent neural networks, neural voice embeddings, similarity learning and speech enhancement.
- Research, design, implementation, training and deployment in production and monitoring of such models.
- AI roadmap design, team management and hiring.

Safety Line | INRIA Saclay | CMAP Ecole Polytechnique
Paris, France

PhD Candidate in Machine Learning and Optimal Control — *Nov. 2015 - Oct. 2018*

- Designed state-of-the-art learning-to-control models for aircraft trajectory optimization.
- Involved mainly model-based reinforcement learning, functional data density estimation, multi-task learning and feature selection.
- Supervised by Frédéric Bonnans and Pierre Martinon.
- Implemented models into python packages for internal use at Safety Line.

French Space Agency (CNES)
Paris, France

Rocket trajectory optimization engineer (*Internship*) — *Apr. - Aug. 2015*

- Designed a trajectory optimization technique tailored for a reusable rocket project.

Systems & Control Center, MINES ParisTech *Paris, France*

Signal processing and statistical learning (*Research Internship)* *Sep. 2014 - Apr. 2015*

- Designed algorithm capable of inferring the orientation of a ballistic missile from a single magnetometer's data.
- Used efficient local Fourier based methods from signal processing and functional data analysis.
- Work performed under Lionel Magnis supervision during his PhD Thesis.
- Implementation in Matlab.

AIRBUS *Madrid, Spain*

R&D Lean Engineer (*Internship)* *Mar. - Jul. 2014*

- Supported implementation and deployment of Lean tools within Engineering departments for the A380 project.

AIRBUS Defence&Space *Friedrichshafen, Germany*

Satellites Thermal Tests Engineer (*Internship)* *Jun. - Dec 2013*

- Implementation of a pipeline connecting new satellite test monitoring system with thermal analysis tool for the Sentinal-2 mission.

Skills

Programming Languages **Fluent:** Python (*Tensorflow, Pytorch, scikit-learn, pandas, numpy...*), NodeJS, Git, LaTeX | **Notions:** C++, Java, Matlab
Mother tongues: Portuguese, French | **Fluent:** English, Spanish | **Notions:** German, Mandarin

Publications and pre-prints

Gaussian Mixture Penalty for Trajectory Optimization Problems *Submitted Oct. 2018*

C. Rommel, J.F. Bonnans, B. Gregorutti, P. Martinon *April 2019*

Journal of Guidance, Control, and Dynamics

Structured Feature Selection of Continuous Dynamical Systems for Aircraft Dynamics Identification

C. Rommel, J.F. Bonnans, B. Gregorutti, P. Martinon *Dec. 2018*

Quantifying the closeness to a set of random curves via the Mean Marginal Likelihood

C. Rommel, J.F. Bonnans, B. Gregorutti, P. Martinon *Jan. 2018*

Under review for publication in ESAIM Probability and Statistics

Block sparse linear models for learning structured dynamical systems in aeronautics

C. Rommel, J.F. Bonnans, B. Gregorutti, P. Martinon *Nov. 2017*

Aircraft dynamics identification for optimal control *Milan, Italy*

C. Rommel, J.F. Bonnans, B. Gregorutti, P. Martinon *Jul. 2017*

European Conference for Aeronautics and Space Science

Research Posters

Data Science Summer School | Ecole Polytechnique *Paris, France*

Quantifying the Closeness to a Set of Random Curves via the Mean Marginal Likelihood *June. 2018*

Junior Conference on Data Science and Engineering | Paris-Saclay University *Paris, France*

Aircraft Dynamics Identification *Sep. 2017*

Data Science Summer School | Ecole Polytechnique *Paris, France*

Aircraft Dynamics Identification *Sep. 2017*

Mathématiques, Oxygène du numérique | Institut Henri Poincaré *Paris, France*

Exploration de données pour l'optimisation de trajectoires aériennes *Oct. 2016*

- *Awarded best poster prize from the hands of Fields medal laureate Cédric Villani*