Pierre-Cyril Aubin-Frankowski

Civil servant at Corps des Ponts, Eaux et Forêts
PhD Candidate in Applied Mathematics

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`https://pcaubin.github.io/`

Education

2018 - 2021 **PhD in Applied Mathematics**, *Mines ParisTech*, Paris.
Machine learning and control theory at the CAS laboratory under the supervision of Prof. N. Petit
Inference of dynamical systems based on vehicle trajectories

2017 - 2018 **Master of Public Policy**, *AgroParisTech and ENPC*, Paris.
Banking and macroeconomics, Law, Environmental dialogue
Master focusing on sustainable development and transportation issues designed for the civil servants of Corps des IPEF

2016 - 2017 **Master of Science (M2)**, *ENS Paris-Saclay*, Cachan.
Machine Learning and Big Data - Highest honors
Specialized in convex optimization and kernel methods
Master MVA (Mathematics-Vision-Learning)

2013 - 2016 **Master of Science**, *École polytechnique*, Palaiseau.
Major : Applied Mathematics
Minor : Quantum Physics and (Neuro)biology

2011 - 2013 **Scientific preparatory class**, *Lycée Louis-le-Grand*, Paris.
MPSI, MP*

Experience

April 2018 - July 2018 **MPP internship**, *Research and Innovation Division, MTES.*
Theme : AI for the scientific and technical agencies of the ministry
Report on the applications of artificial intellgience at the Ministry of Environment

Mars 2017- Aug. 2017 **MS internship**, *CBIO, Ecole des Mines.*
Theme : Gene regulation inference from single-cell RNA sequencing
Recovering dynamics from a time-labeled point cloud of experimental measurements under the supervision of Prof. J-P.Vert

Mars 2016 - July 2016 **Research internship**, *IfA, ETH Zurich.*
Theme : Modeling of cerebral autoregulation
Cyclical systems identification under the supervision of Prof. J.Lygeros

Oct 2013-April 2014 **Civic service**, *Association Tremplin.*
Full-time science teacher in senior high school in the outskirts of Paris

Skills

Programming Languages: Matlab, Python, C/C++, Java, OCaml

Languages: English - Proficient / Italian - Bilingual / Russian - Reading

Other

Painting (president of the Polytechnique Art Society), Opera (representative of Polytechnique Arts Society), Economic history, Foundations of quantum mechanics

Journal articles

All the documents (video, pdf et slides) are available at `https://pcaubin.github.io/`

[1] (Under review) PCAF and Zoltán Szabó, *Handling Hard Affine Shape Constraints in RKHSs*, January 2021, `https://arxiv.org/abs/2101.01519`

[2] SICON PCAF, *Linearly-constrained Linear Quadratic Regulator from the viewpoint of kernel methods*, **SIAM Journal on Control and Optimization**, February 2021, `https://arxiv.org/abs/2011.02196`

[3] CRM PCAF, *Interpreting the dual Riccati equation through the LQ reproducing kernel*, **Comptes Rendus. Mathématique**, January 2021, `https://arxiv.org/abs/2012.12940`

[4] Bioinformatics PCAF and Jean-Philippe Vert, *Gene regulation inference from single-cell RNA-seq data with linear differential equations and velocity inference*, **Bioinformatics**, June 2020, `https://www.biorxiv.org/content/10.1101/464479v1`

[5] S&C L PCAF, *Lipschitz regularity of the minimum time function of differential inclusions with state constraints*, **Systems & Control Letters**, May 2020

Conference proceedings

[1] ICML Anna Korba, PCAF, Szymon Majewski and Pierre Ablin, *Kernel Stein Discrepancy Descent*, **ICML 2021**, July 2021

[2] NeurIPS PCAF and Zoltán Szabó, *Hard Shape-Constrained Kernel Machines*, **NeurIPS 2020**, December 2020

[3] IFAC WC PCAF, Nicolas Petit and Zoltán Szabó, *Kernel Regression for Trajectory Reconstruction of Vehicles under Speed and Inter-Vehicular Distance Constraints*, **IFAC WC 2020**, July 2020

[4] ECC PCAF and Nicolas Petit, *Data-driven approximation of differential inclusions and application to detection of transportation modes*, **ECC 2020**, May 2020

Summer schools and courses attended

- Machine Learning Summer School (MLSS) Tübingen, July 2020 (selected among 180 PhD students for more than 1300 candidates), `http://mlss.tuebingen.mpg.de/2020/index.html`
- Joint Structures and Common Foundations of Statistical Physics, Information Geometry and Inference for Learning (SPIGL'20), July 2020, `https://franknielsen.github.io/SPIG-LesHouches2020/`
- Two courses given by EECI International Graduate School on Control (IGSC), 2020, in stabilization (Profs. Isidori et Marconi) and geometric control (Prof. Respondek)

Teaching

- 2020/2021: Teaching assistant in optimization for 3rd year of undergraduate studies at MINES ParisTech
- 2019/2020: Teaching assistant in optimization for 3rd year of undergraduate studies at MINES ParisTech