Pierre-Cyril Aubin-Frankowski

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Born: 17/08/1994
PhD in Applied Mathematics obtained in July 2021

Areas of expertise. Machine learning, Control theory, Optimization.
Specialist knowledge. Kernel methods, Functional analysis, Optimal control, State constraints, Infinite-dimensional convex optimization.

Appointments and Education

Sept 2021 -	**Post-doctoral researcher**, *INRIA SIERRA*, Paris. **Kernel methods for constrained optimization problems with A. Rudi, funded by ERC Starting grant REAL**
Sept 2018 - Aug 2021	**PhD in Applied Mathematics**, *MINES ParisTech*, Paris. **Machine learning and control theory at the CAS laboratory under the supervision of Prof. N. Petit** *Estimation and Control under Constraints through Kernel Methods*
Sept 2017 - Aug 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*
April 2018 - July 2018	**Master of Public Policy internship**, *Research and Innovation Division, French Ministry of Ecological Transition (MTES)*. Theme: AI for the scientific and technical agencies of the ministry
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)*
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
2013 - 2016	**Master of Science/Engineering diploma**, *École polytechnique*, Palaiseau. ***Cycle ingénieur polytechnicien* Major: Applied Mathematics** Minor: Quantum Physics and (Neuro)biology

Journal articles

All the documents (video, pdf and slides) are available at `https://pcaubin.github.io/`. When the text is already online, just click on the title to access it.

[1]	Integral Equations and Operator Theory	PCAF and Stéphane Gaubert, *Tropical reproducing kernels and optimization*, 2022 (to be published)
[2]	JMLR	PCAF and Zoltán Szabó, *Handling Hard Affine Shape Constraints in RKHSs*, 2022
[3]	Pure and Applied Functional Analysis	PCAF and Alain Bensoussan, *The reproducing kernel Hilbert spaces underlying linear SDE Estimation, Kalman filtering and their relation to optimal control*, 2022 (to be published)

[4]	SIAM J. on Control and Optimization	PCAF, *Linearly-constrained Linear Quadratic Regulator from the viewpoint of kernel methods*, 59(4) 2693–2716 2021
[5]	Comptes Rendus. Mathématique	PCAF, *Interpreting the dual Riccati equation through the LQ reproducing kernel*, 359(2) 199–204, 2021
[6]	Bioinformatics	PCAF and Jean-Philippe Vert, *Gene regulation inference from single-cell RNA-seq data with linear differential equations and velocity inference*, 36(18), 4774–4780, 2020
[7]	Systems & Control Letters	PCAF, *Lipschitz regularity of the minimum time function of differential inclusions with state constraints*, 139 104677, 2020

Conference proceedings

[1]	NeurIPS 22	PCAF, Anna Korba, Flavien Léger, *Mirror Descent with Relative Smoothness in Measure Spaces, with application to Sinkhorn and EM*, May 2022
[2]	IEEE CDC 22	PCAF and Alain Bensoussan, *Operator-valued Kernels and Control of Infinite dimensional Dynamic Systems*, 2022
[3]	IFAC CAO 22	PCAF, *Stability of solutions for controlled nonlinear systems under perturbation of state constraints*, 2022
[4]	ICML 21 (long oral)	Anna Korba, PCAF, Szymon Majewski and Pierre Ablin, *Kernel Stein Discrepancy Descent*, 139 5719–5730, 2021
[5]	NeurIPS 20	PCAF and Zoltán Szabó, *Hard Shape-Constrained Kernel Machines*, 33 384–395, 2020
[6]	IFAC WC 20	PCAF, Nicolas Petit and Zoltán Szabó, *Kernel Regression for Trajectory Reconstruction of Vehicles under Speed and Inter-Vehicular Distance Constraints*, 53(2) 15084–15089, 2020
[7]	ECC 20	PCAF and Nicolas Petit, *Data-driven approximation of differential inclusions and application to detection of transportation modes*, 1358-1364, 2020

Other: Students supervision, Reviewer duties, Invited talks

I have supervised three Master of Science interns: Adrien Chkirate (ENSAE), El Mahdi Khribch (Mines ParisTech), Yuxi Xie (ENSTA). I served as a referee for Bernoulli, JMLR, AMOP, JCOMP, TAC (journals) ICML, AISTATS, NeurIPS, ECC, ACC and CDC (conferences). I have been invited at over 20 national and international conferences, such as the Viennese Conference on Optimal Control and Dynamic Games (ORCOS-VC22), the European Conference on Operational Research (EURO-ESPOO), the French-German-Portugese conference on optimization (FGP22), SIAM Conference on Control and Its Applications (CT21), and more.