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## Experience

2021 - **Post-doctoral researcher, INRIA SIERRA, Paris.**  
**Kernel methods for constrained optimization problems with A. Rudi**

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## 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**  
*Estimation and Control under Constraints through Kernel Methods*

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*

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 intelligence at the Ministry of Environment

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

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

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

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## Skills

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

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

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## Journal articles

All the documents (video, pdf and slides) are available at <https://pcaubin.github.io/>

- [1] (Under review) PCAF and Stéphane Gaubert, *The tropical analogues of reproducing kernels*, February 2022, <https://arxiv.org/abs/2202.11410>
- [2] (Under review) PCAF and Zoltán Szabó, *Handling Hard Affine Shape Constraints in RKHSs*, January 2021
- [3] SICON PCAF, *Linearly-constrained Linear Quadratic Regulator from the viewpoint of kernel methods*, **SIAM Journal on Control and Optimization**, February 2021
- [4] CRM PCAF, *Interpreting the dual Riccati equation through the LQ reproducing kernel*, **Comptes Rendus. Mathématique**, January 2021
- [5] 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
- [6] S&C L PCAF, *Lipschitz regularity of the minimum time function of differential inclusions with state constraints*, **Systems & Control Letters**, May 2020

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## Conference proceedings

- [1] ICML Anna Korba, PCAF, Szymon Majewski and Pierre Ablin, *Kernel Stein Discrepancy Descent*, **ICML 2021 (long oral)**, 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

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## Awards

- Best post-doc presentation at Lifting Inference with Kernel Embeddings (LIKE22) Bern, January 2022,

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## Summer schools and courses attended

- Machine Learning Summer School (MLSS) Tübingen, July 2020 (selected among 180 PhD students over more than 1300 candidates),
- Joint Structures and Common Foundations of Statistical Physics, Information Geometry and Inference for Learning (SPIGL'20), July 2020,

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## Teaching

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