Wilson **Jallet**

Applied and computational mathematics

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in/will-jallet github.com/ManifoldFR

Experience

PhD student at **LAAS-CNRS** and Inria Paris 2021–now

Robust constrained trajectory optimization for robots in contact, between the Gepetto team at LAAS-CNRS and the WILLOW team at Inria Paris. Advised by Nicolas Mansard and Justin Carpentier.

Research Intern and predoc at **Inria, WILLOW Team**, Paris, France 2020–2021

Research on control and nonlinear optimization methods for robotics.

Intern, Quantitative Research at **BNP Paribas**, London, UK Mar–Aug 2019

Stochastic models for credit spreads and PDEs for financial derivatives pricing. Monte Carlo and finite-difference methods in C++. Advised by Simon Moreau.

Intern, Data Analytics at **Accuracy**, Paris Area, France Jun–Aug 2018

Studied the influence of film metadata (budget, financing…) on box-office performance. Focus on data mining, feature engineering and selection. Explored leveraging natural language processing (NLP) to extract features from text data (reviews, summaries). Advised by Gil-Arnaud Coche.

Teaching assistant, Lycée Julie-Victoire Daubié, Argenteuil, France 2016–2017

Teaching assistant at a high school in a "priority education area" near Paris. Conducted mathematics and computer science and mathematics workshops.

Education

Master's degree, Applied mathematics & machine learning, ENS Paris-Saclay 2019–2020

MVA (*Mathématiques, Vision, Apprentissage*) master's degree in mathematics and machine learning. Courses taken: optimal transport, deep learning, reinforcement learning, topological data analysis, computer vision and object recognition, 3D point cloud analysis, Bayesian machine learning and graphical models.

Master's degree, Applied mathematics, École polytechnique, Paris 2016–2020

Probability, statistics, stochastic processes, machine learning, Monte Carlo methods, uncertainty propagation, statistical learning, optimization, calculus of variations, distributions, differential equations. 3.86/4 cGPA.

Classes Préparatoires, Mathematics, Lycée Louis-le-Grand, Paris, France 2014–2016

Preparing for the competitive entrance exams of the French (engineering graduate schools), focusing on mathematics, physics, computer science. Admission to École polytechnique.

Projects

Design of nonlinear optimal control algorithms 2021–2022

First project of my PhD thesis. Designed a new algorithm for numerical nonlinear optimal control.

Alpha expansion algorithm & 3D point cloud classification, Master MVA 2020

Implementation of the alpha expansion multi-label graph cut algorithm in C++ using the Boost Graph Library, application of the algorithm to refining semantic segmentation predictions on 3D point clouds.

Solving mean-field games with optimal transport, MVA master's 2019–2020

Solving mean-field games using optimal transport theory and the Sinkhorn algorithm, implementation in Cython. Extension of the original paper to bounded/nonconvex domains using numerical heat kernels. Advised by Gabriel Peyré.

Humanoid robot imitation of motion from videos, MVA master's 2019–2020

High-frequency event modeling with point processes, École polytechnique Sep–Dec 2018

Modeling self-exciting temporal point processes with recurrent neural networks in PyTorch.

Sigma, a calendar & event planner service for Polytechnique 2018–2019

Web service built using JavaScript, handling data from disparate databases. Handled development guidelines, code reviews, training students to take over after my class graduated.

Skills

Programming: Python, C++, Cython, Rust, JavaScript
Tools: Linux, CMake, PyTorch, Git, LaTeX, Django
Interpersonal skills: Teaching, Public speaking

Languages

Native **French**, fluent in **English**, working **Mandarin Chinese**, basics in **German**

Extracurricular

System administrator at **Binet Réseau**, student network/IT services provider 2017–2019
Management of web hosting services & tech support for other students at Polytechnique. Experience with Linux, software development. Deployment of self-hosted services such as a school GitLab and JupyterHub.

Tutor with **Tremplin**, an education non-profit founded by Polytechnique alumni 2017–2018

Publications

Here are some of my publications.

[1] Implicit Differential Dynamic Programming
Wilson Jallet, Nicolas Mansard, Justin Carpentier
2022 International Conference on Robotics and Automation (ICRA), 2022, IEEE Robotics and Automation Society
URL: https://hal.archives-ouvertes.fr/hal-03351641

[2] Constrained Differential Dynamic Programming: A Primal-Dual Augmented Lagrangian Approach
Wilson Jallet, Antoine Bambade, Nicolas Mansard, Justin Carpentier
2022 IEEE/RSJ International Conference on Intelligent Robots and Systems, 2022
URL: https://hal.archives-ouvertes.fr/hal-03597630

[3] Enforcing the Consensus between Trajectory Optimization and Policy Learning for Precise Robot Control
Quentin Le Lidec, Wilson Jallet, Ivan Laptev, Cordelia Schmid, Justin Carpentier
2022