Matthieu Darcy

Website
Email: mdarcy@caltech.edu
GitHub: github.com/MatthieuDarcy
LinkedIn: matthieu-darcy-88290a18a
Twitter: Matt_D_Darcy

EDUCATION

Caltech   Pasadena, California
Ph.D. Candidate in Computing and mathematical Sciences, 2nd year.   2021–present
Advisors: Profs. Houman Owhadi, Andrew M. Stuart.

ENS Paris-Saclay - Institut Polytechnique de Paris   Paris, France
Mathématiques Vision et Apprentissage, with Highest Honors (mention "Très Bien").   2020–2021

Imperial College London   London, United Kingdom
MSc Applied Mathematics, with Distinction.   2019–2020

King's College London   London, United Kingdom
BA Mathematics and Philosophy, first class.   2016–2019

RESEARCH EXPERIENCE

French Commission for Atomic Energy
Research Intern   5/2021-8/2021

- Deep Learning for Hexahedral Meshing.

Imperial College London
Master's project.   5/2020-9/2020

- Application of Kernel Flows to regression problems.

RESEARCH INTEREST

I am interested in the applications of wavelets, Gaussian processes and kernel methods to problems in Machine learning and Applied Mathematics.

- **Stochastic Differential Equations**: inference of the drift and diffusion of stochastic differential equations from data.
- **Operator Learning**: learning non-linear operators using wavelets and kernel methods, with applications to learning the solution operator of Partial Differential Equations and to solving integro-differential functional equations.
- **Dynamical Systems**: learning dynamical systems for data.

PUBLICATIONS AND PREPRINTS

[1] M. Darcy, B. Hamzi, G. Livieri, H. Owhadi, and P. Tavallali, *One-shot learning of stochastic differential equations with computational graph completion*, 2022.

[2] M. Darcy, B. Hamzi, J. Susiluoto, A. Braverman, and H. Owhadi, *Learning dynamical systems from data: A simple cross-validation perspective, part ii: Nonparametric kernel flows*, Dec. 2021.

Conferences and Seminars

- Third Symposium on Dynamical Systems and Machine Learning 2022, Fields Institute, Toronto, CA - Poster.
- International Conference on Continuous Optimization (ICCOPT) 2022, Lehigh, PA, USA - Talk.
- Caltech SIAM chapter 2022, Pasadena, CA, USA - Talk.
- Second Symposium on Dynamical Systems and Machine Learning 2020, Fields Institute, Toronto, CA - Talk.

Teaching

- **Teaching Assistant** for graduate-level courses at Caltech   2023
  ACM 118: Stochastic Processes and Regression, 2023.
- **Refresher course tutor** for incoming graduate students at Caltech   2022
  Developed and taught a course reviewing linear algebra and functional analysis.

Computer Skills

- **Python:** proficient in numpy, scikit-learn, scipy, JAX, pandas, pytorch.
- **LaTeX:** proficient

Languages

- **English:**   native
- **French:**   native