

Matthieu Blanke

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RESEARCH POSITIONS

Courant Institute of Mathematical Sciences **New York, USA**
Postdoctoral Associate **2025**
Deep learning for climate models, advised by Sara Shamekh and Pierre Gentine.

EDUCATION

Inria Paris and DI ENS **Paris, France**
PhD **2021-2024**

Deep learning for physical systems, advised by Marc Lelarge.

École Normale Supérieure Paris-Saclay **Paris, France**
Master of Science *Mathématiques, Vision, Apprentissage (MVA)* **2020-2021**
Machine learning, optimization and statistics. Also passed exams of statistical physics courses at ENS Paris.

École polytechnique **Paris, France**
Engineer's degree *Cycle ingénieur polytechnicien* **2017 - 2021**
Applied mathematics, computer science, theoretical physics

WORK EXPERIENCE

Inria Paris **Paris, France**
Research internship **April - September 2021**
Deep implicit layers with applications to physical systems. Advised by Marc Lelarge.

Econophysix **Paris, France**
Research internship **June - September 2020**
Particle-based stochastic modeling of the latent order book. Advised by Michael Benzaquen and Jean-Philippe Bouchaud.

Saildrone **Alameda, CA, USA**
Platform team intern **June - August 2019**
Processing of oceanographic data collected by drones, fault detection.

PUBLICATIONS

An updated list is available on [my Google Scholar page](#).

- Matthieu Blanke, Ronan Fablet, Marc Lelarge. Neural Incremental Data Assimilation. Accepted at the AI for Science workshop, at ICML 2024.
- Matthieu Blanke, Marc Lelarge. Interpretable Meta-Learning of Physical Systems. The Twelfth International Conference on Learning Representations, 2024 ([ICLR 2024](#)). Also presented at the Synergy of Scientific and Machine Learning Modeling workshop, at ICML 2023 (SynS & ML 2023).
- Matthieu Blanke, Marc Lelarge. FLEX: an Adaptive Exploration Algorithm for Nonlinear Systems. The Fortieth International Conference on Machine Learning, 2023 ([ICML 2023](#)). Also presented at the Machine Learning and the Physical Sciences workshop, at NeurIPS 2022.
- Matthieu Blanke, Marc Lelarge. Online greedy identification of linear dynamical systems. 61st Conference on Decision and Control, 2022 ([CDC 2022](#)).

Also presented at the Adaptive Experimental Design and Active Learning in the Real World workshop, at ICML 2022.

- Matthieu Blanke, Jose Moran, Pierre-Philippe Crépin, Jean-Philippe Bouchaud, Michael Benzaquen. Market impact in a multiple metaorder landscape. Under submission.

PROJECTS AND SOFTWARE

The projects are available on [my GitHub page](#).

Neural Incremental Data Assimilation	2024
Deep learning model for the data assimilation inverse problem, built with JAX.	
CAMEL	2023
Interpretable meta-learning of physical systems	
FLEX	2022
Adaptive exploration of physical systems.	
Deep Latent Variable Models	2021
Maximum likelihood sampling and missing data imputation based on deep learning. Supervised by S. Allassonnière.	
Market impact simulator	2020
Python module for noisy market impact experiments.	
Image segmentation: Random Walker and SegNet	2019
Theoretical study and Python implementation of the Random Walker algorithm. Performance benchmark versus the deep learning architecture SegNet. Supervised by S. Allassonnière.	
Automatic sport scene modeling	2020
A C++ library that automatically detects the players' positions on a sport video.	
Machine learning for power consumption forecast	2019
Clustering, pattern detection and statistics on weather data from Météo France to predict energy consumption. Implemented the algorithms from scratch in C++.	
IP-over-Discord	2018
A C program and a Node.JS Discord Bot for IP-over-Discord network tunneling.	
Physics exercise book	Ongoing
Open source exercise book for undergraduate students preparing for the competitive exams for the top French engineering schools.	

PRESENTATIONS

03/2024	Mines Paris Geosciences Department, invited talk	Paris
Interpretable Meta-Learning of Physical Systems.		
07/2023	MLIA seminar, invited talk	Paris
Interpretable Meta-Learning of Physical Systems.		
12/2023	ICML in Paris, contributed talk	Paris
FLEX: an Adaptive Exploration Algorithm for Nonlinear Systems.		
04/2023	Oral presentation for Safran Research	Paris
Exploration of physical systems.		
12/2022	ML4Physical Sciences workshop, poster presentation	Paris
Online exploration of nonlinear physical systems.		

10/2022 **Inria PhD Seminar, oral presentation** Paris
 Exploration of physical systems.

06/2022 **GdR IASIS, poster presentation** Paris
 Online greedy identification of physical systems. "Apprentissage et modélisation physique" workshop.

09/2021 **CIRM Workshop, poster presentation** Marseille
 Deep learning isochronism. "On Future Synergies for Stochastic and Learning Algorithms" workshop.

TEACHING

Mines PSL Paris, France
 Teaching assistant
 Fall 2023
 Probability theory. Differential equations.

Université Paris Cité Paris, France
 Teaching assistant
 Spring 2023
 Numerical physics.

Université Paris 1 Panthéon-Sorbonne Paris, France
 Teaching assistant
 Fall 2022
 Statistics.

Université Paris Cité Paris, France
 Teaching assistant
 Spring 2022
 Numerical physics.

Université Paris 1 Panthéon-Sorbonne Paris, France
 Teaching assistant
 Fall 2021
 Statistics.

École polytechnique, X-Talents Paris, France
 Oral Examiner 2018
 Weekly mathematics and physics oral tests preparing undergraduate students for the competitive entrance examinations of French top engineering schools.

SERVICE

Organizer of the team's seminar 2022-2024

Reviewing ICML Workshop Synergy of Scientific and Machine Learning Modeling, NeurIPS workshop on Machine Learning and the Physical Sciences

SKILLS

Computer languages Python, Julia, C, C++, Node.js, \LaTeX

Python frameworks PyTorch, JAX

LANGUAGES

French Native
Italian Native
English Fluent
German Advanced
Spanish Conversational