Théo **Uscidda**

French and Italian passports • Born 19-08-1998
Email: theo.uscida@gmail.com
Website: https://theouscidda6.github.io/
LinkedIn • Google Scholar • Github • Twitter

EDUCATION

ENSAE – Institut Polytechnique de Paris, Area of Paris, France — Nov 2021 – Dec 2025 *(Expected)*
Ph.D. Candidate at the Center for Research in Economics and Statistics (CREST)

- Research interests: Optimal Transport, Generative Modeling, Representational Learning.
- Advised by Marco Cuturi (Apple MLR Paris – CREST).

École Normale Supérieure Paris-Saclay, Area of Paris, France — Sept 2020 – Sept 2021
MRes "Mathématiques, Vision, Apprentissage" (MVA) – Achieved with Highest Honors, GPA: 4.0/4.0

- Major in Machine Learning and Computer Vision.
- Relevant coursework: Convex Optimization, Topological Data Analysis, Computational Statistics, Probabilistic Graphical Model, Computational Optimal Transport, Kernel Methods, Theoretical Foundations of Deep Learning, Sparse Signal Representation, Computer Vision, Natural Language Processing, Bayesian Machine Learning, Machine Learning for Time Series.

Télécom Paris – Institut Polytechnique de Paris, Area of Paris, France — Sept 2018 – Sept 2021
Engineering Degree – Achieved with Highest Honors, GPA: 4.0/4.0

- Major in Mathematics, Minor in Computer Science.

PROFESSIONAL EXPERIENCE

Flatiron Institute, New York City, USA | *Research Intern* — June 2024 – August 2024
Simons Foundation – Center for Computational Biology (CCB)

- Topic: Generative Modeling for Biophysics.
- Advised by Michael Shelley (New York University – CCB), Victor Chardes (CCB), and Surya Maddu (CCB – Harvard QBio).

Helmholtz AI, Munich, Germany | *Visiting Ph.D.* — Feb 2024 – Nov 2024
Computational Health Center – Institute for Computational Biology (ICB)

- Topic: Generative Modeling for Single-Cell Genomics.
- Advised by Fabian J. Theis (Technical University of Munich – ICB).

Sorbonne Université, Paris, France | *Master Thesis* — Apr 2021 – Sept 2021
Laboratory of Probability, Statistics and Modeling (LPSM)

- Topic: Federated Missing Data Imputation using Optimal Transport.
- Advised by Claire Boyer (LPSM), Julie Josse (INRIA PreMeDICaL), and Boris Muzellec (Owkin, ex INRIA SIERRA).

Telecom Etude (Junior Enterprise), Paris, France | *Project Manager* — Apr 2019 – Apr 2020
Student-run consulting firm with 40 years of experience, certified ISO 9001

- Provide an interface between companies and student entrepreneurs to realize missions focused on machine learning. Supervised 10 missions in parallel with my 4th-year bachelor's degree, generating a revenue of 10.3k$.

Corsica Ferries, Bastia, France | *Summer R&D Intern* — Jun 2019 – Sept 2019
The leading ferry operator for tourism and cargo on the Western Mediterranean Sea

- Implemented a dynamic pricing algorithm for travel tickets, using data continuously gathered on the company's website.

PUBLICATIONS & PREPRINTS

- **Mirror and Preconditioned Gradient Descent in Wasserstein Space**, Clément Bonet, Théo Uscidda, Adam David, Pierre-Cyril Aubin-Frankowski, Anna Korba; *arXiv Preprint, arXiv:2406.08938.*
- **Entropic (Gromov) Wasserstein Flow Matching with GENOT**, Dominik Klein*, Théo Uscidda*, Fabian J. Theis, Marco Cuturi; *arXiv Preprint, arXiv:2310.09254.*
- **Disentangled Representation Learning through Geometry Preservation with the Gromov-Monge Gap**, Théo Uscidda*, Luca Eyring*, Karsten Roth, Fabian J. Theis, Zeynep Akata*, Marco Cuturi*; in *International Conference on Machine Learning (**ICML**) 2024 Workshop on* **Structured Probabilistic Inference & Generative Modeling** ***(SPIGM)***.

- **Unbalancedness in Neural Monge Maps Improves Unpaired Domain Translation**, Luca Eyring*, Dominik Klein*, Théo Uscidda*, Giovanni Palla, Niki Kilbertus, Zeynep Akata, Fabian J. Theis; *in Proceedings of the 12th International Conference on Learning Representations (**ICLR**) 2024.*
- **The Monge Gap: a Regularizer for All Transport Maps**, Théo Uscidda, Marco Cuturi; *in Proceedings of the 40th International Conference on Machine Learning (**ICML**),* 2023.

ADDITIONAL PROJECTS

Co-supervision of Carl Scandelius's Research Program | *with Prof. Zeynep Akata* June 2024 – Aug 2024

- Topic: Learning the prior distribution in VAE-based Disentangled Representational Learning.
- 3-month internship as part of Harvard Bachelor's Degree.

Co-supervision of Pablo Acuaviva's Master Thesis | *with Prof. Fabian J. Theis* Apr 2024 – Sept 2024

- Topic: The impact of the cost function in Optimal Transport Flow Matching.
- 6-month internship as part of MSc "Mathematics in Data Science" at the Technical University of Munich (TUM).

Co-supervision of Adam David's Master Thesis | *with Prof. Anna Korba* Apr 2023 – Sept 2023

- Topic: Towards extending Wasserstein gradient flows to general strictly convex and translation invariant cost functions.
- 6-month internship as part of MRes "Mathématiques de l'Aléatoire" (MDA) at the Université Paris-Saclay and École Normale Supérieure (ENS) Paris.

Who are the high-frequency traders? | *AMF Data Challenge* Jan 2021 – Jun 2021

- Designed an algorithm to detect high-frequency traders from behavioral variables based on order and transaction data provided by the AMF (French Financial Markets Authority).
- Top 1%; invited by the AMF to present the work to the France and Quebec Data Intelligence team.

TEACHING ASSISTANT

Taught **192 hours** of **tutorial classes** to both **undergraduate** and **graduate students** at ENSAE – IP Paris.

- **Statistical Learning Theory** (Prof A. Stromme): **graduate** course, **30 students**, taught in 2023.
- **Computational Optimal Transport** (Prof. M. Cuturi): **graduate** course, **50 students**, taught in 2022 & 2023.
- **Deep Learning** (Prof. M. Cuturi): **graduate** course, **50 students**, taught in 2022 & 2023.
- **Probability Theory** (Prof VE. Brunel): **undergraduate** course, **30 students**, taught in 2022.
- **Introduction to Machine Learning** (Prof V. Perchet): **undergraduate** course, **30 students**, taught in 2022.
- **Simulation & Monte Carlo** (Prof N. Chopin): **undergraduate** course, **30 students**, taught in 2022.
- **Functional & Convex Analysis** (Prof. L. Deucreusefond): **undergraduate** course, **30 students**, taught in 2021 & 2022.
- **Applied Statistical Learning** (Prof M. Hebiri): **graduate** course, **50 students**, taught in 2021.

TALKS & POSTER SESSION

- **Google DeepMind Reading Group on Generative Modeling, Diffusion & Transport,** Google DeepMind, London, April 2024. *"Unbalancedness in Neural Monge Maps Improves Unpaired Domain Translation"* [1h Talk].
- **Université Paris-Saclay Welcome Day**, Institut des Hautes Études Scientifiques (IHES), Area of Paris, October 2023. *"Optimal Transport & Deep Learning"* [1h Talk].
- **International Conference on Machine Learning (ICML)**, Honolulu, July 2023. "*The Monge gap: a Regularizer for All Transport Maps"* [Poster session].
- **Student Statistical Seminar**, CREST, Area of Paris, May 2023. "*The Monge gap: a Regularizer for All Transport Maps"* [30min Talk].

ACADEMIC SERVICE

- **Conference Reviewer:** International Conference on Machine Learning (ICML) 2023, 2024; Neural Information Processing Systems (NeurIPS) 2023, 2024; International Conference on Machine Learning (ICLR) 2024
- **Journal Reviewer:** Journal of Machine Learning Research.

SOFTWARE

- **OTT-JAX**, Contributor, https://github.com/ott-jax/ott.

SKILLS & EXTRACURRICULAR

Technology: Python, JAX, PyTorch, TensorFlow, Scikit-Learn, Latex, Spark, C, C++, Java, SQL, Matlab.

Languages: French (native), English (fluent), Italian (fluent).