Théo **Uscidda**

French and Italian passports • Born 19-08-1998
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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, Large Language Models.
- Advised by Marco Cuturi (Apple MLR).

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.

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

- Major in Mathematics, Minor in Computer Science.

PROFESSIONAL EXPERIENCE

Amazon, New York City, USA | *Applied Scientist Intern* — Dec 2024 – Mar 2025 *(Expected)*
Amazon Web Services (AWS) AI Labs – Fundamental Research Team

- Working on large language models.
- Advised by Matthew Trager (AWS), Alessandro Achille (AWS – Caltech) and Stefano Soatto (AWS – UCLA).

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

- Working on generative modeling for biophysics.
- Advised by Victor Chardes (CCB), Surya Maddu (CCB – Harvard QBio) and Michael Shelley (CCB – New York University).

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

- Working on generative modeling for single-cell perturbation.
- 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)

- Working on federated missing data imputation.
- Advised by Claire Boyer (LPSM), Julie Josse (INRIA PreMeDICaL, ex-Google), and Boris Muzellec (Owkin, ex-INRIA SIERRA).

Corsica Ferries, Bastia, France | *Research Intern* — May 2019 – Aug 2019
The leading ferry operator for tourism and cargo on the Mediterranean Sea

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

PUBLICATIONS & PREPRINTS

- **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 Proceedings of the 13th International Conference on Learning Representations (**ICLR**) 2025.*
- **Mirror and Preconditioned Gradient Descent in Wasserstein Space**, Clément Bonet, Théo Uscidda, Adam David, Pierre-Cyril Aubin-Frankowski, Anna Korba; ***Spotlight** in the 38th Annual Conference on Neural Information Processing Systems (**NeurIPS**) 2024.*
- **GENOT: Entropic (Gromov) Wasserstein Flow Matching**, Dominik Klein*, Théo Uscidda*, Fabian J. Theis, Marco Cuturi; *in the 38th Annual Conference on Neural Information Processing Systems (**NeurIPS**) 2024.*
- **On the Potential of Optimal Transport in Geospatial Data Science**, Nina Wiedemann, Théo Uscidda, Martin Raubal; *in the International Conference on Learning Representations (**ICLR**) 2024 Workshop on Tackling Climate Change with Machine Learning.*

- **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.

STUDENT SUPERVISION

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 Selman Özleyen's Master Thesis | *with Prof. Fabian J. Theis* Apr 2024 – Sept 2024

- Topic: Imputation of Spatial Transcriptomics using Optimal Transport-based Generative Models.
- 9-month internship as part of MSc "Data Engineering and Analytics" at the Technical University of Munich (TUM).

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

- Topic: Optimal Transport Flow Matching for Unpaired Image Translation.
- 9-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: Wasserstein Gradient Flows with General 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.

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, **70 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

- **Google DeepMind Reading Group on Generative Modeling, Diffusion & Transport,** Google DeepMind, London, April 2024. *"Unbalancedness in Neural Monge Maps Improves Unpaired Domain Translation".*
- **Université Paris-Saclay Welcome Day**, Institut des Hautes Études Scientifiques (IHES), Paris, October 2023. *"Optimal Transport & Deep Learning".*
- **Statistical Seminar**, CREST, Paris, May 2023. "*The Monge gap: a Regularizer for All Transport Maps".*

ACADEMIC SERVICE

- **Conference Reviewer:** International Conference on Machine Learning (ICML) 2023, 2024, 2025 – Neural Information Processing Systems (NeurIPS) 2023, 2024 – International Conference on Machine Learning (ICLR) 2024, 2025.
- **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), Matlab, SQL, Spark, Java, C.

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