

# Ferdinand Genans

🌐 [ferdinand-genans.github.io](https://ferdinand-genans.github.io) | ✉ [genans.ferdinand@gmail.com](mailto:genans.ferdinand@gmail.com) | 📞 +33 6 47 13 14 25

## SUMMARY

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PhD candidate in Statistics. Expertise in **statistical modeling**, **machine learning**, and **large-scale evaluation under uncertainty**. Former Student Researcher at **Google Research**, with experience developing analytics pipelines and applying statistical methods to improve large-scale systems.

## INDUSTRY EXPERIENCE

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### Student Researcher, Google Research

Sep 2025 – Mar 2026

- Researched stochastic and robust optimization methods for large-scale vehicle routing under demand uncertainty.
- Built an end-to-end Python analytics pipeline for large-scale experiments, model evaluation, and performance reporting.
- Developed evaluation metrics to measure route consistency, ETA stability, and customer-to-vehicle allocation quality.
- Designed algorithms that improved consistency by 70% across routing, estimated arrival times, and customer allocation.

## PROJECT

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### Optimal Transport-based Statistics Python Library

Jan 2025 – present

Developing a high-performance OT-statistics module for the Python Optimal Transport library. The goal is to make statistical learning and model evaluation methods more accessible to machine learning researchers and data scientists, with a focus on **scalable implementation**, uncertainty quantification, and **high-performance** computation using **PyTorch** for GPU and **C++** for CPU. Work in progress, release expected in May 2026.

## PUBLICATIONS

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- **Stochastic Optimization in Semi-Discrete Optimal Transport: Convergence Analysis and Minimax Rate.** F. Genans, A. Godichon-Baggioni, F.-X. Vialard, O. Wintenberger. **NeurIPS 2025 Spotlight.** [arXiv](#)
- **Decreasing Entropic Regularization Averaged Gradient for Semi-Discrete Optimal Transport.** F. Genans, A. Godichon-Baggioni, F.-X. Vialard, O. Wintenberger. **NeurIPS 2025.** [arXiv](#)
- **Fast and Large-Scale Unbalanced Optimal Transport via its Semi-Dual and Adaptive Gradient Methods.** F. Genans. **COLT 2026.** [arXiv](#)
- **Geometry-Aware Optimal Transport: Fast Intrinsic Dimension and Wasserstein Distance Estimation.** F. Genans, O. Wintenberger. *Preprint; under review at NeurIPS 2026.* [arXiv](#)
- **Increasing Missingness to Reduce Bias: Richardson-SGD with Missing Data.** F. Genans, E. Scornet *Preprint; under review at NeurIPS 2026* [Link](#).

## EDUCATION

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Sep 2023 – Aug 26	PhD in <b>Mathematics and Statistics</b> , Sorbonne University Thesis title: Stochastic Algorithms for Optimal Transport Advisors: A. Godichon-Baggioni, F.-X. Vialard, O. Wintenberger	Paris, France
Sep 2021 – Jun 2023	M.Sc. in <b>Applied Mathematics</b> , Sorbonne University Ranked first in cohort	Paris, France
Sep 2021 – Jun 2023	M.Sc. in <b>Data Science</b> , Statistical Institute of Paris (ISUP) Ranked first in cohort	Paris, France

## SKILLS

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Programming	Python, PyTorch, scikit-learn, NumPy, Pandas, C++ (reading/modifying), Protocol Buffers
Machine Learning	Statistical Learning, Missing values, Multivariate statistics, Optimization, Optimal Transport
Languages	French (native), English (C1, TOEIC), Russian (B2)