

THÉO DUMONT

PhD student at LIGM, Univ. Gustave Eiffel (Marne-la-Vallée, France)
Optimal transport / Riemannian geometry / machine learning

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1. OVERVIEW

1.1. Summary. I am a PhD student in mathematics at LIGM (Université Gustave Eiffel), under the supervision of François-Xavier VIALARD, Théo LACOMBE and Virginie EHRLACHER. I am studying the geometry of several optimization problems related to optimal transport (OT), such as regularized OT or Gromov-Wasserstein, and I am always happy to discuss!

1.2. Interests and recent work. My interests span the theory of OT and Riemannian geometry, and I am passionate about the interplay between those fields. I recently worked with F.X. VIALARD and T. LACOMBE on the Gromov-Wasserstein problem [1], with P. HARMS on the infinite-dimensional geometry of neural networks, and with K. MODIN on gradient flows in the diffeomorphism group.

2. CURRICULUM

2.1. Education.

- 2023– : **PhD in mathematics, LIGM (Université Gustave Eiffel)**
Thesis: *Geometry of some optimization problems on spaces of measures*
Supervisors: [François-Xavier VIALARD](#), [Théo LACOMBE](#) and [Virginie EHRLACHER](#)
- 2021–2022: **M.Sc., ENS Paris-Saclay, Master 2 MVA (Mathematics, Computer Vision and Machine Learning)**
Thesis: *Existence of Monge maps for the Gromov-Wasserstein problem* ([link of the thesis](#))
Supervisors: [François-Xavier VIALARD](#) and [Théo LACOMBE](#)
- 2018–2022: **M.Sc., Mines Paris – PSL University (Applied Mathematics and Computer Science)**
- 2016–2018: **B.Sc., Lycée Sainte-Geneviève (Mathematics, Physics, Fundamental and applied Computer Science)**

2.2. Research experiences.

- 2023:
(2 months) **Chalmers University (Göteborg, Sweden)**, internship (infinite-dimensional Riemannian geometry)
Gradient flows in the diffeomorphism group
Supervisor: [Klas MODIN](#)
- 2022–2023:
(6 months) **NTU Singapore**, internship (infinite-dimensional Riemannian geometry)
Intrinsic geometry of neural networks
Supervisor: [Philipp HARMS](#)
- 2022:
(6 months) **Université Gustave Eiffel – LIGM**, internship (optimal transport)
Existence of Monge maps for Gromov-Wasserstein [1]
Supervisors: [François-Xavier VIALARD](#) and [Théo LACOMBE](#)
- 2021:
(6 months) **Tekal.ai, working with MIT CSAIL**, internship (deep learning)
Video memorability prediction [2]
Supervisor: [Camilo Fosco](#)
- 2020–2021:
(6 months) **InterDigital, Inc.**, internship (deep learning)
Temporal segmentation of facial features
Supervisors: [Claire-Hélène DEMARTY](#) and [Frédéric LEFEBVRE](#)
- 2020:
(3 months) **Turing Centre for Living Systems (INMED)**, internship (computer vision)
Image processing and dimensionality reduction for neuronal coactivity detection in the brain [3]
Supervisors: [Rosa COSSART](#) and [Julien DENIS](#)

2019–2020: **Mines Paris – Center for Mathematical Morphology**, internship (deep learning)
 (6 months) *Image segmentation by superpixels* [4]
 Supervisor: [Bruno FIGLIUZZI](#)

3. PUBLICATION LIST

See also my [Google Scholar](#) page.

3.1. Optimal transport and geometry.

- [1] [T. Dumont](#), T. Lacombe, and F. X. Vialard. “On the Existence of Monge Maps for the Gromov-Wasserstein Problem”. In: *arXiv preprint arXiv:2210.11945* (2022). [PDF](#) [CODE](#).

3.2. Other.

- [2] [T. Dumont](#), J. S. Hevia, and C. L. Fosco. “Modular Memorability: Tiered Representations for Video Memorability Prediction”. In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2023, pp. 10751–10760. [PDF](#) [CODE](#).
- [3] R. F. Dard, E. Leprince, J. Denis, S. R. Balappa, D. Suchkov, R. Boyce, C. Lopez, M. Giorgi-Kurz, T. Szwagier, [T. Dumont](#), et al. “The rapid developmental rise of somatic inhibition disengages hippocampal dynamics from self-motion”. In: *Elife* 11 (2022), e78116. [PDF](#) [CODE](#).
- [4] D. Paulovics, B. Figliuzzi, [T. Dumont](#), and F. Blanc. “A supervised algorithm entirely trained on a synthetic dataset to segment granular suspension images”. Preprint. 2023. [PDF](#) [CODE](#).

4. COMPUTER AND LANGUAGE SKILLS

Proficient:	Python, PyTorch, git, Unix, \LaTeX , BASH, SQL, Adobe Suite	English:	Fluent	(C1, TOEFL 113/120)
		French:	Native speaker	
Intermediate:	Java, OCaml, HTML, CSS, Coq	Italian:	Intermediate	(B1)
		Japanese:	Basic	(A2)