CLÉMENT WEINREICH

Student at Master MVA - ENS Paris-Saclay

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SUMMARY

Curiosity-driven motivated master's student with strong research experience, actively seeking research positions and **PhD opportunities** in applied mathematics and machine/deep learning.

SKILLS

Programming: Python, Julia, R, Matlab, C#, C++, Shell, JS, SQL

Deep / ML: PyTorch, Tensorflow, Scikit-learn, OpenCV

Maths for ML: Convex optimization, Statistical learning, Probability, Calculus, Linear algebra

EDUCATION

Sep 2023 – Sep 2024 | **Master MVA (Mathématiques, Vision, Apprentissage)** | **ENS Paris-Saclay**
- Research master in mathematics for machine and deep learning, current grade of **18/20**.
- Convex optimization, Statistical learning, Numerical imaging, Time series, Geometric data analysis, Generative Modeling, Deep learning, 3D Modeling, Inverse problems.

Sep 2022 – Jan 2023 | **Exchange program at UC Davis** | **University of California, Davis**
- Exchange during the first semester of the last year of engineering school, obtained a **4/4 GPA**.
- Machine learning, Mathematics of machine learning, Algorithm design and analysis.

Sep 2020 – Aug 2023 | **Master of engineering in cognitive engineering** | **ENSC Bordeaux INP**
- **Ranked first** over the 3 years with overall grades of **16.4/20**, **16.8/20** and **18.2/20**.
- Applied mathematics, Signal processing, Computer science, Cognitive sciences, User-centered design.

Sep 2018 – Aug 2020 | **Associate's degree in computer science (DUT informatique)** | **IUT de Vannes**
- Two years of intensive coursework in computer science, ranked second in the final semester.
- Advanced programming, Algorithms, Unix, Applied mathematics, Cybersecurity.

RECENT EXPERIENCE

Apr 2024 – Sep 2024 | **Research internship in physics-driven learning and neural rendering** | **Inria Paris (Astra-Vision)**
- Developing **physics-driven learning** approaches to create generalizable and interpretable models for motion dynamics and extreme deformations.

Feb 2023 – Aug 2023 | **Research internship in neural rendering and deep learning** | **Ubisoft La Forge**
- Developed innovative techniques for real-time 2D/3D graphics rendering with neural networks, focusing on efficient **material compression**.
- Benchmarked state-of-the-art methods (**NeRF**, SIREN, Instant-NGP, etc.) and established a PyTorch training and evaluation pipeline on a GPU cluster using SLURM.
- **Publication:** Weinreich, C., de Oliveira, L., Houdard, A., & Nader, G. (2023). Real-Time Neural Materials using Block-Compressed Features (arxiv) published at **Eurographics 2024**

May 2022 – Jul 2022 | **Research internship in statistics for dimensionality reduction** | **Inria Bordeaux (ASTRAL)**
- Developed a variant of the Sliced Inverse Regression (SIR) method involving a new thresholding step allowing variable selection in statistical models, presented at the **JDS 2022 conference** (see the slides)
- Publication of an **open source R package** on CRAN (SIRthresholded) with a **vignette**

RECENT PROJECTS

March 2024 | **Neural Optimal Transport (Report)** | **MVA**
Theoretical and empirical study of a deep learning based algorithm to compute **optimal transport** maps and plans for strong and weak transport costs, application to **image-to-image translation.**

Feb 2024 - Mar 2024 | **3D Gaussian Splatting (Report)** | **MVA**
Conceptual and experimental analysis of **3DGS** to understand its limitations and potential improvements.

Oct 2023 – Dec 2023 | **Riemannian Geometry on the latent space of Variational Autoencoders (GitHub)** | **MVA**
Conducted a theoretical and experimental analysis of the latent space in **Variational Autoencoders** using Riemannian geometry, enabling meaningful distance and interpolation calculations within this space.

Nov 2023 – Dec 2023 | **Texture Synthesis with Optimal Transport (Report)** | **MVA**
Explored a texture synthesis model based on **semi-discrete optimal transport** in patch space, studied its limitations and proposed extensions to the original paper.

Jan 2022 – Apr 2022 | **Open source deep learning library in Julia (GitHub)** | **ENSC**
Developed a deep learning library in Julia, leveraging the mechanism of **automatic differentiation**. Employed software development best practices such as continuous integration, documentation, and testing.