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 **internship** 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.
- Convex optimization, Statistical learning, Numerical imaging, Time series, Geometric data analysis.

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.

EXPERIENCE

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.
- **Preprint:** Weinreich, C., de Oliveira, L., Houdard, A., & Nader, G. (2023). Real-Time Neural Materials using Block-Compressed Features (hal-04255874)
- Working prototype being integrated into a Ubisoft game.

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

Jun 2021 – Jul 2021 **Internship in robotics** — **Pollen robotics**
- Developed and integrated new **control** and regulation modes in Python for a teleoperated robot via virtual reality (in C#), including a **force regulation** algorithm for the robot's gripper.

Apr 2020 – Jun 2020 **Internship in computer vision** — **Smartmoov**
- Developed deep learning models using Tensorflow and OpenCV for **depth estimation** to automate safety distance compliance detection from vehicle-mounted dashcams.

PROJECTS

Oct 2023 – Present **Geometric data analysis project on generative models (GitHub)** — **MVA**
Conducted a theoretical and experimental analysis of generative models' latent space (VAEs in particular), using Riemannian geometry to enhance model performance and interpretability.

Nov 2023 – Present **Image processing and optimal transport project (GitHub soon)** — **MVA**
Explored a texture synthesis model that applies local transformations to Gaussian random fields by solving a semi-discrete optimal transport problem on patch space. Study of the limitations and possible extensions of the paper A Texture Synthesis Model Based on Semi-discrete Optimal Transport in Patch Space.

Jan 2022 – Apr 2022 **Open source deep learning library in Julia (NNJulia on 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.