

NICOLAS SCHEER

R&D Developer — Simulation, Rendering & Machine Learning

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Available now — MSc-level engineering degree (Télécom SudParis) awarded November 2026

PROFILE

Final-year engineering student at Télécom SudParis (High Tech Imaging track), building tools at the intersection of physics simulation, rendering and machine learning: a GPU-accelerated MPM solver in C++/CUDA integrated into Blender, an OptiX path tracer, and ML quality-control pipelines for production motion capture. Looking for an R&D Developer / Tools Developer role in VFX.

EXPERIENCE

- 2025 – 2026 **MocapLab · Paris area** — R&D Intern, two assignments (rehired after the first)
[Python](#) · [PyTorch](#) · [scikit-learn](#) · [NumPy](#) · [TRC mocap data](#)
- Eye-tracking error detection** · Mar 2026 – Jul 2026
- ML pipeline that automatically flags eye-tracking errors in production mocap data (8 markers, 60 Hz, ~20 actors).
 - Combined features: kinematic derivatives, inter-marker regression residuals, rigidity residuals (Procrustes), autoencoder reconstruction error, CNN eye-state classifier (open / half-closed / closed).
 - Actor-grouped cross-validation (GroupKFold) to measure generalisation to unseen performers.
 - **Cut manual cleanup time from ~30 min to ~5 min per minute of capture.**
- Motion deduplication** · Sep 2025 – Oct 2025
- ML model detecting duplicate takes in a motion-captured sign language dictionary.
 - Replaced manual review with fully automatic duplicate detection.
- Jun – Jul 2024 **Setec IS · Paris** — Intern
- Analysed tender responses for network infrastructure projects and wrote decision-support reports.

R&D PROJECTS

videos and details: nicolassch2er.github.io/projets

- 2026 – present **Bourrasque — GPU-accelerated simulation solver**
[C++](#) · [CUDA](#) · [Python](#) · [Blender API](#)
- MLS-MPM solver (Hu et al., 2018): water (Tait equation of state), elastic solids (corotated), sand; Blender extension for artist-facing integration (ctypes bridge, modal operator).
 - Every kernel validated against a Python reference implementation: GPU 3×3 SVD within $1.9 \cdot 10^{-4}$ of NumPy over 5,402 matrices; sand model validated by angle of repose (25° / 35° / 45°).
 - 128³-grid dam break: up to 2.9 M particles, Zhu-Bridson surface meshed on the fly (up to 3.2 M triangles), ~7.6 s/frame for the full simulate + mesh + Cycles render pipeline.
- 2026 – present **rl_mesh — reinforcement learning locomotion**
[Python](#) · [RL](#) · [mocap data](#)
- An agent learns physically simulated character locomotion by imitating motion capture, with no manual keyframing.
- 2026 **BVHNet — physically based path tracer** (v1 complete)
[C++](#) · [OpenMP](#) · [OptiX](#)
- CPU (OpenMP) and GPU (OptiX, RT cores) path tracer written from scratch, importing glTF scenes exported from Blender.

2026	Hyperforge — Blender 5.0 extension for 4D geometry Python · Geometry Nodes · procedural shaders Generates, animates and visualises the six regular 4D polytopes and 4D fractals (Julia, Mandelbulb, Mandelbox, Apollonian); hybrid Python / Geometry Nodes architecture on Blender 5.0's volume pipeline.
2025 – present	Hydraulic Erosion — Blender 5.0 extension Python · Blender 5.0 API · particle simulation Particle-based erosion on heightmaps, written from scratch and fully ported to the new Blender 5.0 API.
2025 – 2026	Blender Version Manager — multi-version management tool Python · modular architecture Manages side-by-side Blender installs with automatic detection of build naming conventions.

EDUCATION

2023 – 2026	Télécom SudParis · Évry, France — Diplôme d'ingénieur (MSc-level) High Tech Imaging track (imaging, computer vision, 3D) and computer science. Degree awarded November 2026.
2021 – 2023	Classes préparatoires (PCSI) · Lycée Hoche, Versailles Two-year intensive maths/physics programme preparing for the French engineering school entrance exams.

SKILLS

Languages	C++ · CUDA · Python · C · Git
GPU & rendering	CUDA · OptiX · OpenMP · path tracing · BVH · Cycles
Simulation	MLS-MPM · APIC · PBF / XPBD · surface reconstruction (Zhu-Bridson)
ML & vision	PyTorch · scikit-learn · ONNX Runtime · OpenCV · CNN · U-Net · autoencoders
3D & DCC	Blender (bpy, extensions, Geometry Nodes) · glTF · Agisoft Metashape · DEM data
Familiar with	Houdini · Unreal Engine · BlenderProc

LANGUAGES & INTERESTS

Languages	French (native) · English (C1) · German (B2)
Savate (French boxing)	2013 – 2023 · Cadet World Champion 2019 (Budapest)