ALEXEI CZORNYJ

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EDUCATION

EUR Software Design and Development (MSc) September 2024 - September 2026
University of Poitiers, France
Courses: Introduction to Research, Geometric Design and Mechanical Simulation for Health, Machine Learning, 3D Algorithmics, Parallel Programming

BSc Computer Science September 2021 - June 2024
University of Poitiers, France
Graduated with honours,
Courses: Object-Oriented Programming, Functional Programming, Software Engineering and Project Management, Human-Computer Interfaces

RESEARCH EXPERIENCE

Research Intern (Planned) April 2026 - August 2026
Ecole de Technologie Supérieure, Montréal – Mitacs Funding

- Extension of prior work on neural importance sampling for multi-layered materials by exploring more expressive architectures and training strategies to better capture high-dimensional BSDF distributions
- Investigation on generalization of learned sampling models across material classes and layer configurations, with a focus on robustness and stability in Monte Carlo integration
- Enhanced integration within the Mitsuba renderer, refining custom BSDF and sampling plugins and conducting systematic evaluations against analytical and state-of-the-art reference methods
- Supervised directly by Adrien Gruson and Mickaël Ribardière

Part-Time Research Intern September 2025 - March 2026
XLIM Laboratory, Poitiers

- Developed an interactive BSDF viewer using C and Vulkan shaders, supporting any analytical model with real-time parameter manipulation
- Implemented Tekari-like view to enable researchers to analyze material appearance properties for validation and comparison purposes
- Supervised directly by Mickaël Ribardière

Research Intern June 2025 - August 2025
Ecole de Technologie Supérieure, Montréal

- Designed and trained neural network models using PyTorch to learn importance sampling distributions for multi-layered materials, improving variance reduction in Monte Carlo rendering
- Integrated neural sampling techniques with Mitsuba renderer, implementing custom BSDF plugins and validating against reference solutions for various layered material configurations
- Supervised directly by Adrien Gruson

Part-Time Research Intern September 2024 - May 2025
XLIM Laboratory, Poitiers - ANR Digitalis Project

- Introduction to research methodology as an assistant for a PhD student
- Implemented texture synthesis algorithms using Python, applying exemplar-based techniques to simulate weathering effects on digital artwork reproductions
- Supervised by Rémi Orveau (PhD student) and Daniel Meneveaux

Research Intern April 2024 - June 2024
XLIM Laboratory, Poitiers - ANR Digitalis Project

- Produced comprehensive data visualizations analyzing point-cloud renderings with Python (Matplotlib, Pandas, NumPy), generating figures comparing rendering quality metrics across different methods
- Performed statistical analysis on rendering performance data, for a supplemental of a state-of-the-art publication in computer graphics
- Supervised directly by Mickaël Ribardière

WORK EXPERIENCE

Part-Time Show Coordination Agent June 2022 – November 2025
Parc du Futuroscope, Jaunay-Marigny

As a member of the Entertainment department at Parc du Futuroscope, I took on various roles that allowed me to expand my skillset and navigate a corporate work environment. Notable responsibilities included delivering public presentations, collaborating with teams and interacting with external stakeholders but also mentoring and training others in their roles .

VOLUNTEER EXPERIENCE

Treasurer September 2024 – September 2025
Association of Futuroscope Science Students

As Treasurer of the Association of Futuroscope Science Students from September 2024 to September 2025, I managed the organization's budgets, coordinated events and sponsorship initiatives, and maintained a proactive presence in campus life.

PROJECTS

Kestrel - C++ Rendering Engine September 2025 - Present
A sandbox renderer engine written in C++ from scratch. Features will include a path-tracing core, multiple importance sampling, and a modular architecture for easy extension. The project aims to explore rendering techniques and optimize performance on modern hardware.

TECHNICAL SKILLS

Programming Languages	Python, C++, CUDA
Graphics APIs	OpenGL, Vulkan
Machine Learning and Rendering	PyTorch, Mitsuba
Research Interests	Computer Graphics, Rendering, Neural methods
Data Science	Matplotlib, Pandas, NumPy

LANGUAGES

French	Native
English	Fluent