

# ALEXEI CZORNYJ

Montréal, QC

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Currently searching for a PhD position worldwide in Computer Graphics, with a specific focus on rendering techniques and material appearance modeling.

## EDUCATION

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**EUR Software Design and Development (MSc)** Sept 2024 - Sept 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** Sept 2021 - June 2024

University of Poitiers, France

Graduated with honours (13 out of 79 graduates)

Courses: Object-Oriented Programming, Functional Programming, Software Engineering, Human-Computer Interfaces

## RESEARCH EXPERIENCE

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**Research Intern** April 2026 - August 2026

*École de Technologie Supérieure, Montréal*

- Extension of neural importance sampling for the specific case of multi-layered materials
- Study of generalization across material classes and robustness in Monte Carlo integration
- Integration within Mitsuba renderer with custom BSDF and sampling plugins
- Supervised by Adrien Gruson and Mickaël Ribardière

**Part-Time Research Intern** Sept 2025 - March 2026

*XLIM Laboratory, Poitiers*

- Developed an interactive BSDF viewer using C and Vulkan shaders
- Implemented visualization tools for material analysis and validation
- Supervised by Mickaël Ribardière

**Research Intern** June 2025 - August 2025

*École de Technologie Supérieure, Montréal*

- Implemented state of the art networks for importance sampling of layered materials
- Integrated methods into Mitsuba renderer with custom BSDF plugins
- Supervised by Adrien Gruson

**Part-Time Research Intern** Sept 2024 - May 2025

*XLIM Laboratory - ANR Digitalis*

- Implemented texture synthesis algorithms (Python) for artwork aging simulation
- Applied exemplar-based techniques for realistic degradation effects
- Supervised by Rémi Orveau and Daniel Meneveau

**Research Intern** April 2024 - June 2024

*XLIM Laboratory - ANR Digitalis*

- Produced data visualizations for point-cloud rendering analysis (Matplotlib, Pandas, NumPy)
- Performed statistical analysis contributing to a state-of-the-art publication
- Supervised by Mickaël Ribardière

## WORK EXPERIENCE

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### Show Coordination Agent (Part-Time)

June 2022 - Nov 2025

*Parc du Futuroscope*

- Delivered public presentations and interacted with large audiences
- Collaborated with teams and external stakeholders

## VOLUNTEER EXPERIENCE

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### Treasurer

Sept 2024 - Sept 2025

*Association of Futuroscope Science Students*

- Managed budgets and financial planning
- Coordinated events and sponsorship initiatives
- Actively contributed to campus life

## PROJECTS

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### Kestrel - C++ Rendering Engine

Sept 2025 - Present

Sandbox renderer written from scratch with path tracing, MIS and modular architecture.

Available on GitHub: Kestrel

### Material Explorer - C/Vulkan

Sept 2025 - March 2025

Interactive BSDF viewer for material analysis and validation, with real-time rendering and visualization tools.

Available soon on the XLIM forge.

### Iteryne - MAML Algorithm Implementation

May 2026

Meta-learning algorithm implemented in PyTorch for few-shot regression tasks.

Available on GitHub: Iteryne

## TECHNICAL SKILLS

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### Programming Languages

Python, C++, CUDA

### Graphics APIs

OpenGL, Vulkan

### Machine Learning and Research

PyTorch, Mitsuba

### Research Interests

Computer Graphics, Rendering, Neural Methods

### Data Science

Matplotlib, Pandas, NumPy

## LANGUAGES

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**French** Native

**English** Fluent (TOEIC 920)