Wylliam Cantin Charawi, CEP

wylliam.cantin.charawi@gmail.com | wylliamcantincharawi.dev

Experience

Computer Vision and Graphics Researcher, CVG Kawasaki Laboratory, Kyushu University | Multimedia Lab & LIVIA, ÉTS – Fukuoka, Japan & Montreal, QC   May 2024 – September 2025

- Published a paper to **3DV** introducing **Differentiable Clipped Centroidal Voronoi Tessellation (DCCVT)**, a novel framework for paving Voronoi diagrams with differentiable clipped centroids to extract high-quality meshes from implicit surfaces using **PyTorch**, outperforming state-of-the-art marching tetrahedra and Voronoi-based extraction methods.

Computer Vision Research Developer, Zebra Technologies – Montreal, QC   May 2023 – August 2023

- Developed a **Python** pipeline tool to augment barcode datasets using **C++** and the Matrox Imaging Library to create test files and run benchmarks on different AI models and algorithms, reducing costs by 1500%.
- Captured real-world hazmat label data, built and augmented a dataset, and trained an **RTMDet/YOLO** model to accurately recognize labels in video feeds with 98.2% accuracy.

Analyst Programmer, Loto-Québec (Technologies Nter) – Montreal, QC   January 2022 – April 2022

- Developed and improved the performance of several **Vue.js** components, resulting in a fluid and responsive UI.
- Proposed a **Bootstrap** and **CSS** typography solution, resulting in a responsive and dynamic UX.
- Implemented improvements to Agile practices within the team, leading to the adoption of story points.

Junior Developer, Vokeso (Gold Microsoft Partner) – Montreal, QC   May 2021 – August 2021

- Developed and customized **MC Dynamics 365 Business Central** extensions and reports.
- Developed a website using **HTML**, **CSS**, **React.js**, **PHP**, **Postman API**, and **MSSQL**.
- Compartmentalized databases and processes using **Docker** and multiple Azure VMs.

Leadership

SWE Representative Administrator, Association Étudiante ÉTS – Montreal, Qc   September 2021 – May 2024

- Sat on AÉÉTS board of directors, managing a 1M$ budget and organized activities for SWE students

Technology Application Technician, ÉTS – Montreal, Qc   September 2021 – May 2024

- Tutored students for their mechanical, electrical and optical physics lab activities (ING150, PHY332, PHY335)

Projects

Voronoify | *Python, CUDA C++, Rust*   github.com/tiwylli/voronoify

- Engineered multiple high-performance implementations of a Voronoi image generator, targeting CPU, multi-core CPU, and GPU architectures to analyze performance trade-offs.
- Developed a native CUDA C++ solution using the Jump Flooding Algorithm (JFA) for labeling and a custom parallel reduction kernel for color averaging, eliminating host-device transfer bottlenecks.
- Built a memory-safe, parallel version in Rust with Rayon, providing an alternative for systems without a GPU.

Rendering Engine – Monte Carlo Path Tracer | *Rust, Python, Blender*   github.com/tiwylli/PBR-Engine

- Implemented a physically based Monte Carlo path tracer featuring Multiple Importance Sampling (MIS) and Next-Event Estimation (NEE), extending light transport support to homogeneous participating media via Henyey–Greenstein phase functions.
- Engineered a hybrid intersection pipeline combining standard mesh traversal with ray-marched Signed Distance Fields accelerated by Bounding Volume Hierarchies, integrated with Intel OIDN for denoising.

Education

École de Technologie Supérieure (ÉTS) – M.Sc.A in Information Technology Engineering   December 2025
École de Technologie Supérieure (ÉTS) – B.Eng. in Software Engineering   August 2024