

# Kyle Lukaszek

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## Education

### University of Guelph

Honours Bachelor of Computing, Major in Computer Science

Completed Major in April 2024, Completing Minor ~2025

90% Average Over The Last 4 Terms, Most Recent Dean's List: April 2024

### Guelph, ON, Canada

Sept 2020-Apr 2025 (Expected)

## Projects @ kylelukaszek.com

**ColourSpaces:** My undergraduate research project was independently designing and developing new portable, real-time 3D colour space visualization tools. Achieved sub-16ms frame time on consumer laptops rendering 16 million individual particles from the browser by leveraging WebGPU compute shader technology.

### SDL3 WebGPU:

Simple DirectMedia Layer (SDL) recently released a new version with its graphics and compute backend using Vulkan, DX, and Metal. In my free time, I am porting the functionality of the Vulkan backend to WebGPU, as WebGPU is an abstraction of Vulkan anyway. I am currently getting Graphics Pipelines working with shader reflection. This is still a work in progress.

### Google Tint WASM:

Ported Google's open-source WGSL shader cross-compiler to WASM with a C++ API so that browsers can support SPIR-V shaders for WebGPU apps by doing shader reflection on the SPIR-V binaries, and returning valid WGSL code to be used in your WebGPU applications. This is all done from the browser, which eliminates the need for cross-compilation on the host machine.

## Skills / Toolset

**Natural Languages:** English, French (DELF B2 Certified)

**Programming Languages:** C, TS/JS, Python, C++, Swift, R, C#, Java, OpenCL, CUDA, GLSL, HLSL, WGSL

### Frameworks/Libs:

OpenGL, WebGL, Vulkan, WebGPU, React, UIKit, SensorKit, PyTorch, SciKit, NumPy, Pandas, SPIR-V

**Developer Tools:** GCC, GDB, Valgrind, Git, GitLabs CI/CD, Docker, Kubernetes

## Work / Research Experience

### University of Guelph

CIS\*2750 TA: Software Systems Development and Integration

January 2025-April 2025

Guelph, Ontario

### University of Guelph

Modelling Human Perception of Colour Based on Ambient Illumination

January 2024-January 2025

Guelph, Ontario

**Working as a full-time colour & light research assistant supervised by Dr. Denis Nikitenko.**

- Research assistant helping develop a model to better understand Situational-Visual-Impairments in direct sunlight. Learned a lot about optics and light transport.
- Developed a Unix compatible JETI API for the JETI Spectral 1501 spectroradiometer using the SPECFIRM. Bluetooth is implemented for both Linux and MacOS.
- Developed an IOS app to assist in testing different colours. It uses IOS SensorKit to measure the Lux at the position of a display we are testing and makes sure the display is at the correct brightness.
- **Our initial paper was accepted for the Graphics Interface 2024 conference in Halifax.**

### University of Guelph

Detection and Prediction of Hate Speech on Social Media Using Machine Learning

May 2023-September 2023

Guelph, Ontario

**Worked as a full-time Undergraduate Research Assistant supervised by Dr. Fattane Zarinkalam and Ph.D candidate Hadiseh Moradisani.**

- Collaborated on a Big Data/IR machine learning project with Toronto Metropolitan University.
- Utilized Python and R libraries such as Google Causal Impact, Huggingface, and sci-kit-learn to develop and train various statistical models to predict hate speech on Twitter.
- Since we were working with a large amount of Twitter data, it was important to try and parallelize as much of my code as possible due to hardware constraints on our work server.
- Maintained well-documented notes for all code written throughout the project.
- Became more interested in the field of machine learning which led me to take a 4th year Computational Intelligence course after completing my work term.

## References

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**Dr. Denis Nikitenko:** PhD in Computer Science / Professor @ UofG  
• **Email:** [dnikiten@uoguelph.ca](mailto:dnikiten@uoguelph.ca)

**Dr. Fattane Zarrinkalam:** PhD in Engineering / Professor @ UofG  
• **Email:** [fzarrink@uoguelph.ca](mailto:fzarrink@uoguelph.ca)

**Hadiseh Moradisani:** Computer Engineering PhD Candidate @ UofG  
• **Email:** [hmoradis@uoguelph.ca](mailto:hmoradis@uoguelph.ca)