Kyle Lukaszek

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Education

University of Guelph — Guelph, ON, Canada

Honours Bachelor of Computing, Major in Computer Science, Minor in Math — *Sept 2020-Apr 2025 (Expected)*

Completed Major in April 2024, Completing Minor ~2025

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

Projects @ kylelukaszek.xyz

SDL3 WebGPU:
Simple DirectMedia Layer (SDL) recently released a new version with its own graphics and compute backend using Vulkan, DX, and Metal. I am working on porting the functionality of the Vulkan backend to WebGPU in my free time as WebGPU is an abstraction of Vulkan anyways. Currently getting Graphics Pipelines working with shader reflection. Program entry etc. is working so it's just a question of time at this point. This is 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.

Nano.h:
C WebGPU Header Library for quick WebGPU browser application protoyping. Currently supports Compute and Graphics Pipelines, and has ImGui support. Currently on the back-burner for SDL3.

Skills

Natural Languages: English, French **(DELF B2 Certified)**
Programming Languages: C, C++, Swift, Python, R, C#, TS/JS, Java, OpenCL, CUDA, GLSL, HLSL, WGSL
Frameworks/Libs:
React, Svelte, OpenGL, WebGL, Vulkan, WebGPU, PyTorch, TensorFlow, SciKit, NumPy, Pandas, SPIR-V
Developer Tools: Git, NPM, Bun, GitLabs CI/CD, Docker, Kubernetes, Unity
Currently Reading: "Real-Time Rendering 4th ed.", "Projective Geometric Algebra Illuminated"

Experience

University of Guelph — January 2024-Present

Modelling Human Perception of Colour Based on Ambient Illumination — *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 Spectraval 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 — May 2023-September 2023

Detection and Prediction of Hate Speech on Social Media Using Machine Learning — *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 the 4th year Computational Intelligence course after completing my work term.

Academic Achievements

- **90% Average Over The Last 4 Terms, Most Recent Dean's List: April 2024**
- Achieved **92% in CIS*4780 Computational Intelligence**. For our final assignment, a partner and I **improved the performance** of existing 3D object classification algorithms using CUDA and Python and then wrote an IEEE conference paper that details our findings and methodology.
  - github.com/klukaszek/3D-Classification
- Achieved **100% in CIS*4820 Game Programming.** The final assignment was creating a game using Unity. I made a 2.5D pixel graphic arena fighter that I'm proud of given the time constraint.
  - github.com/klukaszek/CIS4820-Sprite-Fight
- Achieved **89% in CIS*4800 Computer Graphics.** Built a 3D model loader using WebGL, and then built a BVH based raytracer. Grade would have been higher if I could've made the first test.
  - github.com/klukaszek/BVH-Raytracer
- Achieved **100% in CIS*3210 Computer Networking**. Learned extensively about the networking stack, and wrote a TCP remote file transfer command-line tool using C.
  - github.com/klukaszek/C-Socket-File-Transfer-3210
- Achieved **89% in CIS*3050 Systems Programming.** Learned **POSIX systems programming practices**, and higher-level operating systems concepts. Coursework comprised of BASH and C.
- Achieved **93% in CIS*3760 Software Engineering.** Maintained a full-stack sentiment analysis project with a scrum practicing team. Acted as the primary maintainer of **Gitlabs CI/CD**, **Docker** container management, and **Kubernetes** deployments.
  - github.com/klukaszek/CIS3760-Graphex-Project

References

Dr. Denis Nikitenko: PhD in Computer Science / Professor @ UoG
- **Email:** dnikiten@uoguelph.ca

Dr. Fattane Zarrinkalam: PhD in Engineering / Professor @ UoG
- **Email:** fzarrink@uoguelph.ca

Hadiseh Moradisani: Computer Engineering PhD Candidate @ UoG
- **Email:** hmoradis@uoguelph.ca