

Patrik Buhring

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Education

University of Waterloo

September 2022 - June 2027

- Double Majoring in **Computer Science** and **Pure Mathematics**.
- Candidate for a **Bachelors in Mathematics**. (GPA: 3.69)
- Advanced Computer Science 2 (**98%**): Parsing, Interpreting, and Compiling languages.
- Programming for Performance (**98%**): Concurrent and efficient computation on modern hardware.

Skills

Languages Rust, C#, Java, LaTeX, C, Bash, Dart, Python, Racket, HLSL, GLSL

Frameworks & Libraries WASM, WebGPU, Android, .NET, Linux, Windows, CUDA

Developer Tools Visual Studio, Visual Studio Code, IntelliJ Platform, RenderDoc, Git

Projects

Hypersphere: A Game On The Surface Of A 4D Sphere

Dec. 2022 - Present

Rust, Git, WebGPU, WASM, JavaScript, HTML, and CSS

- Develops math and libraries as needed to support development and serve as a tech demonstration.
- Publishes updates to [website](#) with a live WASM demonstration and a custom-written HTML website.

Hydraulic Erosion Simulation on Spherical Terrain

May 2023 - Present

Rust, Git, and SIMD

- Adapted an existing [hydraulic erosion simulation](#) for spherical terrain: [demo video](#).
- Optimized for both performance and accuracy, leveraging **SIMD** and **multithreading**.
- Integrated a custom flat shading water shader for enhanced visual appeal.
- Presented a talk explaining the implementation at the Summer 2023 SASMS at UWaterloo.

Hexasphere: Open Source Rust Sphere Generation

Aug. 2020 - Present

Rust, Git, and SIMD

- Developed an efficient sphere subdivision algorithm with the aim of reducing distortion.
- More than [1.1 Million downloads](#) downloads.
- Demonstrates expertise in Rust and Git, ensuring quality, maintainable, and well-documented code.
- Maintains and updates the project, showcases dedication to delivering a reliable solution.

JamHacks Hackathon 1st Place Overall

Jun. 2022

Rust, Git, WebGPU, and WASM

- Designed, tested, implemented, and deployed a **WASM** compatible [3D Golfing Game](#).
- Rapidly prototyped in **Rust** with a hand written implementation of physics over two days.
- First attendance of team GalactiGolf to a **Hackathon** with excellent teamwork and communication.

Animated Low Poly Water Graphics Example

Jun. 2020

Rust, Git, and WebGPU

- Contributed to the **open source** library WGPU for multiple backends (**Vulkan**, **DirectX 12**, etc.).
- Demonstrates nontrivial **computer graphics** techniques such as read-only depth-stencil.
- Clean, performant, modular code with **well written documentation** meant as a tutorial.