

William Liu

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SUMMARY

Languages: C++, C, Rust, C#, Java, Python, OCaml, x86 and ARM assembly

Interests: OS, Compilers, Embedded Systems, Concurrency, Graphics, Networks

EDUCATION

University of Waterloo - Bachelor of Computer Science

Sep 2018 - June 2023

- Honours Computer Science (Co-op). Cumulative average: 90%.

EXPERIENCE

Meta - Senior Software Engineer, Neural Band (Wearables)

New York, Aug 2023 - Present

- Led multiprocessing-based redesign to parallelize C++ neural band signal processing framework, achieving up to **2x increased throughput** in real pipelines.
- Designed and rolled out AI-assisted model lowering workflow from PyTorch to ExecuTorch, speeding up research to on-phone/glasses model migration from **days to 1 hour**.
- Led, designed and implemented templated C++ numpy-like Eigen-backed tensor library to accelerate numpy/scipy algorithm translations from Python. Widely adopted across organization, significantly reducing cost of novel feature productionization.
- Developed an emulator-based framework for evaluating neural interactions, enabling large-scale evaluation and rapid improvements of models by removing hardware availability constraints.
- Included as contributor in **Nature published [paper on surface EMG](#)**.

GTS - Software Engineer Intern, Core Tech & Market Access

New York, Sep 2022 - Dec 2022

- Wrote Linux kernel module configuring Intel performance counter monitors to profile inefficiencies.
- Designed & implemented reliable multi-producer multi-consumer message queue over UDP, more performant than Kafka for internal use case.

Meta - Software Engineer Intern, Neural Band (Wearables)

New York, Jan 2022 - May 2022

- Individually ported neural band signal processing framework to Apple M1 architecture, significantly increasing accessibility for >100 researchers.

Microsoft - Software Engineer Intern, Xbox Game Studios

Vancouver, May 2021 - Sep 2021

- Designed & implemented C++ binary serialization library for msgpack in Gears of War game engine's network transport layer, achieving up to **5x faster than official library**.
- Created code generator to automatically write C++ SDK from C# syntax tree.

Spatial - Software Engineer Intern

New York, Apr 2019 - Sep 2019 & Jan 2020 - May 2020

- Pioneered and shipped Stadia-style streaming service for Spatial app, which became the most **popular platform** by customer usage.
- Ported whole Spatial AR/VR app from HoloLens to Oculus Quest near feature parity, implementing native interop from Java to .NET to speed up rendering **by 500%**.

PROJECTS

Realtime OS: handwritten microkernel & drivers for embedded ARM board with serial IO, network stack.

AOT Java Compiler in Rust with custom designed SSA-based IR and modern optimization passes.

Paxitium: multiplayer game in C# reaching **#1 on IndieDB** with over 100,000 international views.

Graphics Engine: Handwritten C++ OpenGL raster graphics engine with physically-based shaders.