

KAELAN MOFFETT-STEINKE

🌐 kaelan.xyz | 🐙 github.com/oasixer | ☎ 647-997-6783 | ✉ kaelan.ms@gmail.com | 🔗 linkedin

Skills

Languages

Proficient Python, Rust, C++, TypeScript, Javascript, Lua, Bash **Familiar** C, Golang, Kotlin, Java, x86

Technologies

TCP/IP, Kubernetes, GraphQL, Docker, Redis, Nginx, Linux, OpenCV, Protobuf

Work Experience

Software Engineer Intern | NVIDIA | Remote

May '22 - Aug '22

- Ported OmniGraph (scalable **graph** engine) nodes for vector math from **Python** to **C++**, resulting in 4x speedup.
- Improved OmniGraph extension installation with global cache, reducing build size by 18+%
- Fixed memory leaks from C++ extensions reloading with pybind11 ABI by forking Pybind as a hotfix.

Backend Engineer Intern | Trexo Robotics | Toronto

Sep '21 - Dec '21

- Created a **Kotlin+Spring Boot** server on **AWS** to manage live data to and from **200 exoskeleton robots**.
- Implemented a fault-tolerant bidirectional **DB sync** (robot ↔ cloud) using **Merkle Tree** based algorithm.
- Created three way integration testing (mobile ↔ robot ↔ cloud) in **Bash**, reducing QA testing workload by 15%
- Improved security, performance and maintainability by porting legacy **ExpressJS** login server to **Spring/Kotlin**

Backend/Infrastructure Engineer Intern | Pronti Inc. | Waterloo

Jan '21 - Apr '21

- Created **Flask** server for registration/logins using SMS 2FA, **JWT**, and **GraphQL** to reduce API boilerplate.
- Reduced runtime of recommender algorithm by 75% by batching SQL queries, and caching results in **Redis**.
- Migrated server container from **GCP** to **Kubernetes** to scale with an influx of users, and implemented waitlist/referral system to manage growth rate.

Backend Developer Intern | Backr Inc. | Toronto

Jun '20 - Sep '20

- Ported high-volume ingestion microservice to **Go**, resulting in 4x speedup over OG **Python** implementation.
- Reduced **AWS** costs by refactoring monolithic ML pipeline into microservices to enable granular scaling.
- Redesigned main DB schema to speed up CRUD with indexing and relationships, migrated **3M** rows using **Python** script, and used **GraphQL** to simplify the associated API endpoints.

Computer Vision Software Intern | North Inc. (Acquired by Google) | Waterloo

Jan '19 - Apr '19

- Created optical raytracing engine using **OpenCV** matrices in **C++** and optimized for specialized ASIC.
- Worked with scientists to create a material property calculator with n-dimensional interpolation in **C++**.
- Improved optical raytracing accuracy by 36% by developing a **DLL** plugin in **C++** for a simulation engine

Projects

Final Year Design Project | Distributed Underwater Positioning System

Sep '22 - Apr '23

- Awarded **Best Overall Project** out of 52 teams presenting at 2023 U of Waterloo Mechatronics Eng. symposium.
- Created positioning system for underwater robots using acoustics, outperforming commercial solutions in tolerance to reflections and obstructions, achieving 85 meter range with 98% accuracy.
- Responsible for a **Rust** Server exchanging high bandwidth data with each node and delivering the UI (app).
- Architected firmware (**C++** on ARM M7), implementing positioning, autocalibration, and fault-tolerant networking
- Enabled realtime freq. analysis, via **sliding window Fast Fourier Transform** at 2μs intervals, processing 20MB/s of acoustic samples.

Side Project | Packet Panic

Oct '23

- High performance **Go networking tool** that emulates bad network conditions in/out of your machine/application, to verify the fault-tolerance of your system in realistic adverse conditions.
- Used **TUN** (kernel virtual interface) to transparently and bidirectionally intercept 3+ Gb/s of layer 3 packets.
- Coroutines** are dispatched to handle requests **concurrently**, apply packet loss/corruption/delay, forward to dest.

Education

University of Waterloo | Mechatronics Engineering BSc | Software Option

Sep '18 - Apr '23

Coursework ▶ Programming for Performance, Search Engines, Adaptive Algos, Datastructures and Algos, Microprocs.