

1126 Chateau Place
Port Moody, BC
V3H 1N6, Canada

Matthew Knight

+1-778-791-4069
mattnite@proton.me



Low-level Software Engineer passionate about linux, security, embedded systems.

SKILLS & TOOLS

Proficient: C, C++, Go, Zig, Python, Git, Unix, Bash, Assembly, JavaScript

Familiar: SQL, Java, Verilog

EXPERIENCE

Staff Software Engineer

Jan 2025 – Present

Zscaler

Remote

eBPF TLS Inspection: Designed a technique to correlate encrypted and plaintext traffic across containers by parsing TLS handshakes on the wire and scanning memory around OpenSSL contexts to find identifying random data. Reassembled plaintext and OpenSSL streams in chunks, efficiently parsing HTTP/1.1 and HTTP/2 to extract request metadata. Robust across OpenSSL versions and buffer-backed configurations such as Node.js.

Kubernetes Security Platform: Built a BPF-based security product that monitored container lifecycle events, auto-attached probes to OpenSSL and Node.js libraries, and connected network metadata to Kubernetes workloads, services, and processes. Implemented endpoint asset discovery and detection of top 10 OWASP vulnerabilities including SQL injection and cross-site scripting.

Infrastructure Inventory & Automation: Built a sync system in Go to bridge a legacy management platform to a new centralized inventory system with an improved data model, serving as the foundation for automated provisioning and upgrades. Developed a standalone metrics runner to assess node service health for upgrade readiness.

Production Performance Analysis: Profiled a production C utility on FreeBSD and identified a single change that reduced memory usage by two-thirds. Navigated FreeBSD-specific performance tooling to land the fix.

Senior Software Engineer

May 2023 – Dec 2024

Sysdig

Remote

BPF Modernization: Improved the Sysdig Agent's deployment model by plumbing in BTF powered BPF programs. This required collaboration with multiple teams to communicate with customers and ensure a good configuration story.

Response Actions: Collaborated on a cross-functional team to develop and launch a multi-level cloud solution, enhancing company competitiveness by enabling users to perform actions across host, cluster, and cloud levels.

Agent Tooling: Leveraged existing codebase to build an automated documentation system, streamlining configuration tracking and improving documentation quality for consistent version comparison.

Senior Software Engineer

Jan 2020 – May 2023

Elastic/Cmd

Remote

Post-Acquisition Integration (Elastic): Ensured the acquisition of Cmd into Elastic was successful by aiding in data model improvements and integrating Cmd agent functionality into Elastic's flagship security product.

Multi-Cluster Testing (Elastic): Met testing requirements by integrating a complex CI Pipeline into existing infrastructure. It ran Elastic's flagship security product in K8s clusters from different cloud providers.

Kubernetes Metadata (Cmd): Supported a new business direction by coordinating the completion of a feature which allowed users to know the specific K8s context in which a session took place.

Pluggable Authentication Module (Cmd): Evaluated a potential product by taking a proof-of-concept and researching different technologies that would allow us to implement it safely and quickly.

Process Context Refactor (Cmd): Improved a customer relationship by improving performance of a core subsystem in the Cmd Agent.

Software Developer II

Oct 2018 – Aug 2019

Avigilon

Vancouver, BC

C++ Visual Recognition Library: Implemented debugging system to dump inputs/outputs, latency and throughput of pipeline that processed images using GPU hardware which verified the performance requirements of video analytics library.

Convolutional Neural Network (CNN) Optimization: Wrote utilities in C++ to take trained neural net models in Caffe or TensorFlow format and optimize them to a graphics processing unit (GPU) architecture which increased throughput 100-200%.

Certificate Management: Used Yocto Linux to add certificate management to Avigilon's internal embedded Linux distribution which filled requirements of high security applications.

Leveraged Knowledge: in C, C++, Application Binary Interfaces, GCC, GDB, OpenCV, Software Debugging, Conan, CMake, Git, Template Metaprogramming, Docker, Linux, Protobuf, CNNs, Python, TensorRT, TensorFlow, Continuous Integration (CI), GPUs, Yocto, SSL Certificates, HTTP APIs, Go, Networking, React, Build Systems, Bash

EDUCATION

Bachelor in Electrical Engineering

British Columbia Institute of Technology

Jan 2014 – Jun 2018

Burnaby, BC

Coursework: Real-Time Embedded Systems, Digital Image and Video Processing, Wireless System Design, Software Systems, Feedback Control, Computer Networking, Digital System Design, Signal Processing and Filters, Sensors for Measurement and Control, Microcontroller Systems.

PROJECTS

Badge for Software You Can Love 2024 (Milan, Italy)

Coordinator

October 2023 - May 16, 2024

- Took existing open source PCB conference badge and reworked the design to upgrade USB connector to USB-C and joystick.
- Coordinated manufacturing in China and performed partial builds at home to deliver 125 badges in time for conference.
- Worked with other developers attending conference to build firmware framework in Zig.
- <https://github.com/ZigEmbeddedGroup/sycl-badge>

Software You Can Love 2023 (Vancouver, Canada)

Organizer

June 7-9, 2023

- Independently organized a conference on the art of writing software for humans.
- Organized with over a dozen speakers that travelled to Vancouver to deliver high quality talks on a diverse set of topics.
- Wrote a Go backend to manage ticket sales and badge information.
- <https://softwareyoucanlove.ca>

Zig Embedded Group

Cofounder

April 2021 – Present

- Collaborating with a number of other developers to create an embedded ecosystem for the Zig programming language.
- Ran workshop to educate attendees on embedded systems in Zig:
<https://sycl.it/agenda/workshops/intro-to-zig-on-embedded/>
- Gave talk breaking down how software interacts with hardware at "Systems Distributed" conference:
<https://systemsdistributed.com>
- <https://github.com/ZigEmbeddedGroup>

Prosthetics and Orthopedics Monitoring System (POMS)

Team Member

Sept 2017 – Jun 2018

Capstone

- Collaborated with orthopedics clinic to determine requirements of Scoliosis brace monitoring system.
- Designed a communication protocol utilizing Bluetooth, End-to-end encryption in order to minimize power consumption of wearable sensor.
- Designed software backend to communicate with patient devices and provide clinicians with graphical interface for analyzing wear-time.
- Built prototype sensor that utilized capacitive sensing to measure wear-time and software backend for demonstration.

BCIT Sailbot

Organizer/Lead

Sept 2017 – Jun 2018

Extracurricular

- Initiated club at BCIT to build and design an autonomous sailing robot for competition.
 - Broke up project and collaborated with other students to research and design solutions for different aspects of the project.
 - Designed software architecture for autonomous navigation.
 - After two years, prototypes for a fixed-wing sail, hull, and novel wind sensor built.
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