Kelvin Koon

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Technical Skills

Languages: C++, C, Python, Go, Java, Bash
Technologies: Node.js, Express, React, MongoDB, Docker
Coursework: Distributed Systems, Security, Machine Learning, Networking, Control Systems

Experience

Tesla Sep 2021 – Dec 2021
Firmware Engineering Intern (Vehicle Software) *Palo Alto, US*

- Developed software-in-loop (SIL) infrastructure for graceful degradation mechanisms using Python and C
- Leveraged CAN simulation tools to add SIL coverage for battery, temperature, and oil pump failures

Amazon May 2021 – Jul 2021
Software Development Engineer Intern (AWS Relational Database Service) *Remote*

- Built a Java-based microservice to create and delete new database engines for AWS re:Invent
- Implemented a metadata configuration interface, eliminating need for unsafe DML queries
- Automated the full region build pipeline, reducing deployment time from 30+ days to 2 minutes

Netgear Aug 2018 – May 2019
Software Developer Co-op (Aircard) *Richmond, CA*

- Implemented diagnostic features in C and C++ to the firmware testing suite for the Nighthawk router
- Worked extensively with iPerf and adb to facilitate throughput validation for 5G device capabilities

Projects

babiri.net | *Go, Python, MongoDB, AWS (Lambda, EC2, ECR), Bash, Docker, Nginx* Jan 2020 – Present

- Developing an open-source data visualization app for competitive Pokémon stats serving 100,000+ visitors
- Built a data pipeline to extract replays, parse logs, and analyze results with Python and AWS Lambda
- Deployed a server with in-memory caching to aggregate usage stats using Go, MongoDB, and AWS EC2
- Configured CI to automate tests and deployment using Github Actions, Bash, Docker, and Nginx

UBC Thunderbots Robotics | *C++, C, Python, Bazel* Jun 2018 – Jun 2021

- Contributed to software and firmware development for open-source autonomous soccer robotics
- Wrote a custom primitives testing framework using Gtest to achieve 78% coverage in previously untested codebase
- Implemented a firmware circular buffer to store recent difference equation values for the motion controller
- Rewrote the control layer firmware abstraction to support grSim's Protobuf format for virtual RoboCup

Distributed Hash Table | *Go, Docker, Bash, GCP (Compute Engine)* Feb 2021 – Apr 2021

- Collaborated on a fault-tolerant and scalable key-value store based on Chord's consistent hashing design
- Implemented three-way replication and keyspace partitioning to mitigate key losses on node failures
- Streamlined GCP Compute Engine deployment using Docker, gcloud SDK, and Bash scripts

PyVPN | *Python (PyQt)* Oct 2020

- Developed a VPN with threaded sockets using AES-GCM encryption for message confidentiality and integrity
- Implemented key establishment and mutual authentication using Diffie-Hellman and private key cryptography

Elevator Simulator | *C++* Nov 2019

- Created a multithreaded elevator simulation system to serve user-input floor requests
- Utilized mutexes, datapools, and pipelines to facilitate inter-process communication

Education

University of British Columbia Graduated November 2021
Bachelor of Applied Science in Electrical Engineering (Co-op Program)