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 using Python and C
- Leveraged CAN simulation tools to add SIL coverage for battery, temperature, and oil pump failures
- Verified safety-critical drive inverter ECU mechanisms by investigating CANape traces

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++ for the 4G/5G router automated firmware testing suite
- Worked extensively with iPerf and Android Debug Bridge to facilitate throughput validation
- Added REL-11 CA band decoding capabilities by refactoring 3GPP MessageDecoder file parsing

Projects

babiri.net | *Go, Python (PyTest), AWS (Lambda, DynamoDB), Docker, Github Actions* Jan 2020 – Present

- Built a full-stack data visualization app for aggregating competitive Pokémon stats to serve 100,000+ users
- Working to rewrite and migrate to Golang-based microservices

UBC Thunderbots Robotics | *C++, C, Python, Bazel, Github Actions* 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)