JOEL RUHLAND

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Engineering student seeking challenging, hands-on R&D experience. Interests in software development, information security, robotics, and aerospace. Eligible to work in the US and Canada.

EMPLOYMENT

Software Engineering Intern - Karat

Seattle, Washington; Remote
May 2017 to Apr 2018

- Feature lead for multiple features with company-wide impact
- Conducted internal security audits to verify compliance with NIST 800-63b
- Independently responsible for the entire development process; information gathering, technical specification development, feature development, review, deployment (**ruby-on-rails**), and support
- Integrated data collection and reporting capabilities into the platform; collected, aggregated and analyzed internal datasets for use by executive, sales and customer success teams (**python**, **R**)

Embedded and Electrical Engineering - Waterloop

Waterloo, Ontario
Sep 2016 to Sep 2017

- Independently designed and collaboratively implemented a end-to-end data **telemetry** and command system, including a **custom networking protocol**
- Developed custom networking and data acquisition software in **Go**, using the language's concurrency features to increase throughput 300% compared to previous iterations
- Developed mechatronic control systems for industry-grade sensor components and actuators (such as the Baluff BOD-series photoelectric distance sensors), and developed driver software in **C++** for integration into main control systems
- Pitched the team to funding opportunities such as the **Canada Business Council**, the Engineering Society, and various local business and startup events

Software Engineer Coop (Network and Security, Architecture Team) - Sandvine

Waterloo, Ontario
Sep 2016 to Dec 2016

- Developed a custom Android application in Java to collect and monitor all TCP/UDP flows to and from the device, and categorize by application
- Modified a raspberry pi to act as a WIFI hotspot and collect all network traffic flowing through it, and extended a **python** service to act as a web frontend allowing users to easily start, stop, and download capture files from across the network
- Developed a **proof-of-concept attack** on a traffic obfuscation and censorship circumvention network, allowing network administrators to detect when the network was being used to bypass restrictions and disable access
- Independently designed and implemented a custom distributed task queue system in **Go**, capable of performing network tests and analysis from locations around the world, including result aggregation and centralization on control nodes

Software Developer in Test - Interset

Ottawa, Ontario
Jan 2016 to Apr 2016

- Designed and implemented a Postgresql data warehouse, as well as a reporting backend in **NodeJS** (including a REST API), and an extensible visualizations frontend, including dashboards (HTML/JS) used for quality assurance and release tracking
- Architected and produced a unified ETL application for the data warehouse (**python**). Included a modular data source framework, with ETL for JIRA and Sonarqube implemented.

PROJECTS

SimpleAES

Current

A **C++** library designed to provide a simple and easy-to-use interface to AES-128 encryption in multiple modes

Autocompletion Libraries

Autocompletion libraries in C and C++ implementing autocompletion using ternary search trees and tries respectively

Zenith Suborbitals

Current

Umbrella organization for a number of space and aerospace-related cooperative activities. Projects include a suborbital flight simulator using 2nd order Runge-Kutta approximations (**python**), lightweight electrical and real-time embedded system design for a 1-pound rocket (designed for 1km altitude) (**C++**, **Eagle**), and an analysis of historical and modern flight control systems.

SwivelCam

Webcam mount and processing software to keep the camera pointed at the face of the current user (**python**, **opencv**, embedded **C++**)

Complex Harmonic Motion as a Means of Pseudorandom Number Generation

Pseudorandom number generator that harnesses the unpredictability of classical chaotic systems via motion tracking (**C#**, AForge.NET)

EDUCATION/CERTIFICATIONS

University of Waterloo

Candidate for Bachelor of Applied Science, Mechatronics Engineering 2020
Academic Representative, Mechatronics Engineering Class of 2020
Algorithms and Data Structures Tutor

FCC Licensed Amateur Radio Operator