

# Gerald Wu

Software Engineering · Computer Science · IT Operations

## Skills

### Programming IT Operations

Java, GoLang, C, C++, Python, Rust, SQL  
Certified Kubernetes Security Specialist (LF-24hswd9rmm)  
Certified Kubernetes Administrator (LF-inn96e0qrb)  
Red Hat Certified System Administrator (180-132-714)  
Kubernetes, GitOps, Terraform, GitLab CI/CD, Docker, VMWare vSphere/vSAN, Ansible, LaTeX, Git

## Education

2017 - 2021

### Brown University

Sc.B. Computer Science, A.B. Applied Mathematics

## Experience

Mar 2023 -  
PRESENT

### Site Reliability Engineer

SpaceX (Starlink)

- Deploy and administer on-premise Kubernetes clusters and cloud-native tooling for Starlink satellites

Jun 2021 - Mar  
2023

### Software Engineer

Google (YouTube)

- Worked with **YouTube Commerce Pre-purchase Serving**
  - Serves valid and best offers given the customer's current standing
- Worked on **migrating backend systems** from existing fragmented infrastructure to a more **unified infrastructure**
  - Ongoing project expected to impact all paying users on the YouTube platform
- Designed and implemented backend systems features for the new Play payment processor on Android
  - Implemented a system to support payment rollbacks for refunds and payment failures
    - In production serving all Android payment rollbacks
  - Implemented a system to allow for true multiple line item checkout
    - Affected millions of currently existing users
- Implemented a **backend system** to support the EU's **price transparency initiative**

May 2020 - Aug  
2020

### Software Engineer Intern

Amazon Web Services (AWS)

- Worked with the **Amazon Connect** team — a **cloud-based** call center as a service product running on **AWS**
- Built a deployment pipeline for **Safe Dynamic Config (SDC)**
  - Implemented strict templating and config generation to allow for configuration as code
- Created library from scratch to pull deployed **SDCs** from remote and parse them for **Feature Access Control (FAC)** (Java)
  - Part of an existing effort to migrate **Feature Access Control** from a flat config file in **S3** to a fast, compartmentalized, safe, dynamic config **deployment as code**

May 2019 - Aug  
2019

### Software Engineer/IT Operations Intern

Leidos

- Core member of **systems architecture** team for next-gen virtualization approach (VMWare/Red Hat/Kubernetes)
  - Researched, evaluated, proposed, and implemented various architectures involving **VMWare** clustering, VMWare **vSAN**, Red Hat **OpenShift**, and **Kubernetes**
  - Met with various vendors to discuss **architecture** and **systems design**
  - Final proposed systems architecture approved for implementation
- Part of software development team working on **autonomous** (self-driving) sea vessels (C++/Python)
- Major contributor of **software migration** process from Red Hat 6 to 7 (C++/Python)
  - Significant code rewriting to fit a **microservice** approach

May 2018 - Aug  
2018

### Software Engineer Intern

FMS Inc.

- Cluster analysis in **large-scale graphs** (C#)
- Implemented secure, PCI-compliant payment integration on the web using Authorize.Net (ASP Classic)

## Projects

### Infrastructure as Code

#### **Homelab IaC — a fully HA k8s deployment using Terraform and Flux**

<https://gitlab.wuhoo.xyz/jerry/homelab-iac>

Starting from minimal working Proxmox and Ceph clusters, this project uses pure Terraform to bootstrap and install a full high availability (HA) deployment of Kubernetes using the k3s distro from Rancher. It uses kube-vip to deploy an on-premise cloud load balancer, and uses Ceph as its container storage interface (CSI) for dynamic volume provisioning.

Since the project is implemented in Terraform, it supports idempotent creation/destruction of the Kubernetes nodes, which allows for easy rolling fixes if necessary. The provisioner also deploys kured and Rancher's system-upgrade-controller to allow for automatic, rolling updates of both the Kubernetes software and the underlying OS.

Following k3s bootstrapping, the project uses Flux gitops to deploy all the Kubernetes workloads in the cluster, including automatic secrets encryption/decryption with Mozilla SOPS. This enables self-documenting, auditable configuration of all the workloads as code.

Both [geraldwu.com](https://geraldwu.com) and [wuhoo.xyz](https://wuhoo.xyz) (and all related services) are hosted on this Kubernetes cluster.

### Golang, Next.js, IaC

#### **medtracker.io — An easy, user-friendly med school tracker with Google Docs integration (defunct)**

<https://medtracker.io>

A webservice to give medical school applicants an easy way to track all their application progress, with a user-friendly dashboard and automatic Google Docs integration. When a user adds a medical school to their profile, a Google Doc is automatically created in their linked Google account associated with the medical school to allow for an easy overview of all applications and their associated statements.

This project uses Golang on the backend, and Next.js on the frontend. For infrastructure, deployment is fully automated with Terraform to deploy a k3s cluster, Flux to deploy and monitor workloads, and GitLab CI/CD to automatically test, build, and push Docker images.

### Golang

#### **Omgur — A FOSS private front-end for Imgur**

<https://gitlab.wuhoo.xyz/jerry/Omgur>

Omgur is a free and open-source private front-end proxy for Imgur, inspired by [Invidious](#), [Nitter](#), and [Teddit](#). Omgur runs with no JavaScript, ads, or tracking. All requests are proxied through the Omgur backend to prevent Imgur from tracking IP or JavaScript fingerprint. Easily self-hostable through the Docker image provided by Gitlab CI/CD.