Branden Kim

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Objective: Senior Software Engineer with 5 years of experience, pursuing a masters degree in ML part-time seeking opportunities to develop data pipelines for ML infrastructure.

Work Experience

Sonos

Senior Software Engineer **Oct 2023 - Feb 2025**

- Designed and implemented a distributed Update Server that aggregates update information from products and delivers firmware and software updates to 50 million products worldwide, reducing costs from $700,000 to $10,000.
  - Implemented a distributed CDN to optimize update times and gathering of product data via geolocation.
  - Improved latency by 300% and reduced CPU utilization through using Kubernetes.
  - Implemented a Redis Caching Layer, reducing RDB read requests by 92%.
  - Created static caching layer to re-direct 88% of requests to edge location servers.
  - Automated a CI / CD pipeline for testing and blue-green deployments through Jenkins and Github Actions.
  - Designed a data streaming pipeline using S3 and Kinesis to store 3M users and 50M product data.
- Designed and implemented a functional style, data-model driven PostgresSQL internal library utilized in a 3-tier service that centralized meta-information about products, firmware, and releases.
  - Implemented an exhaustive type system for declarative composition of custom sql command in virtual DB transaction-chains.
  - Centralized all meta-information for look-up and modification in dev / release cycles.
  - Improved build-to-release times from 6 hours down to 2 hours.
  - Achieved consistent availability using K8s Deployment Sets and multi-region DB replication.
  - Implemented custom design pattern to access DB by virtualizing transactions in a graph-like data structure.
- Designed and implemented a virtual pipeline framework in Scala to create a custom, automated CI / CD pipeline tool that utilized Jenkins in its backend to automate the queuing of jobs to build, deliver, and release firmware across all products.
  - Utilized framework to generate automated release process to release Alpha, Beta, Production firmware.
  - Virtualized Jenkins jobs to reduce developer bugs and Jenkins plugin issues by 72%.

Software Engineer **Aug 2020 - Oct 2023**

- Implemented an internal fullstack, microservices app on AWS Lambda, S3, and StepFunctions for CRUD operations on internal user, product, user groups, and update records.
  - Automated CI / CD pipeline utilizing Jenkins and Github Actions with a Gitflow workflow branching strategy for parallel development and more efficient rollout of features and bug-fixes.
  - Provided distributed load-balancing and SSL termination with a NGINX web-server.
  - Developed custom MapReduce framework library utilizing S3 and StepFunctions to batch process updates to millions of users.
  - Utilized Serverless framework to declaratively create infrastructure and DAO with SQL stored procedures / indexes to optimize DB calls.
  - Expanded app's features to update Redis Caches and other service's DBs upon updates to internal data.
- Designed and implemented a metrics and log aggregation stream by utilizing a Prometheus and Loki server hosted as a sidecar on Kubernetes to aggregate metrics and logs from automation jobs running on Jenkins.
  - Aggregation Jenkins job metrics and logs that optimized build bottlenecks and reduced bugs by 12%.
- Designed automation of building and release delivery of product firmware and meta-data by creating custom workflow scripts in python and Jenkins for job infrastructure.

- Optimized the job's completion time from 12 minutes to 1.5 minutes by utilizing multiprocessing.
- Automated existing manual processes such as using rsync in job workflow scripts to copy files for distribution.

University of Virginia

Research Assistant **Aug 2019 - Aug 2020**

Data Structures and Algorithms Teaching Assistant **Jan 2019 - Aug 2020**

Technical Projects

scwab **2025**

- Implemented a compiler from scratch for the wabbit programming language using Scala and a data-model driven functional programming style.

Transformer-Based Electronic Sub-Genre Classifier **2025**

- Wrote a research paper on implementing a custom Transformer based model architecture for multi-genre music classification specifically in sub-genres in electronic music. Performed transfer learning to utilize an existing BERT model and re-trained on the FMA music dataset and again on a custom dataset with only electronic music. Utilized Fourier Transforms to create embeddings of 30 second music samples which led to a 77% Sensitivity and 78% Specificity rate.

CG Raytracer **2025**

- Implemented a 3D RayTracer in Java for fun / learning purposes utilizing the Processing library in Java. Implemented ray-generation, phong lighting models, shape collision algorithms, and BVH Trees for optimization.

Education

M.S Computer Science ML Specialization, Georgia Institute of Technology **2021 - Present**

B.S Computer Science *Summa Cum Laude*, University of Virginia **2016 - 2020**

Bradfield School of Computer Science, Certifcation of Completion **2022 - 2023**

- Year long private institution program that aimed at breaking software abstractions by understanding low-level software abstractions and building up to implementing distributed consensus algorithms like raft.

Certifications / Courses

NVIDIA Deep Learning Fundamentals — Architecting on AWS — Advanced Architecting on AWS

Skills

Python Pytorch Java Go Docker Terraform Kubernetes Redis Scala Typescript JavaScript C C++ AWS Serverless