Branden Kim

brandenkiminq@gmail.com | 703-223-1009 | github.com/psiionik | linkedin.com/in/branden-kim-17704513b

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.
  - Designed and implemented a distributed Content Delivery Network to optimize update times and gathering of product data in data streams using geolocation.
  - Performed performance optimization on latency and CPU utilization by utilizing Jenkins and K8s to spin up millions of requests. Improved latency by 300% and reduced CPU % utilization through orchestrating a Horizontal Pod Autoscaler in kubernetes.
  - Designed and implemented a Redis Caching Layer to reduce read requests on our RDB cluster by 92%.
  - Implemented a static caching layer to re-direct 88% of requests from the origin to edge location servers.
  - Analyzed sql query plans and DB locking mechanisms and indexes to optimize READ performance on the DB Cluster.
  - Implemented an automated CI / CD pipeline utilizing Jenkins and Github Actions to automate blue-green deployments and preventing bugs through automating our testing framework.
  - Analyzed network traffic through our logging pipeline and implemented a data streaming pipeline using S3 and Kinesis to store 3 million users and 50 million product information in a data lake for analysis.
- 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 that allows for composition of custom multiple sql commands across data models in DB transaction-chains in a declarative style.
  - Centralized all meta-information that allowed developers to look-up and create update packages for testing and release.
  - Improved build-to-release times from 6 hours down to 2 hours.
  - Allowed efficient searching of multiple products based on shared query properties that allows for efficient auditing.
- 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.
  - Converted a manual release process into an automated release process that allows releases of firmware of all products to Alpha, Beta, Production users.
  - Reduced developer bugs and Jenkins plugin issues by 72% by creating a virtualization of Jenkins jobs that allows developers to declaratively specify their job using Scala classes and config files.

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.
  - Implemented automated CI / CD pipeline utilizing Jenkins and Github Actions with a Gitflow workflow branching strategy to allow for parallel development and streamline the rollout of features and bug-fixes.
  - Provided distributed load-balancing and SSL termination by deploying a custom NGINX web-server in front of AWS Lambda microservices.
  - Implemented a custom MapReduce framework library utilizing S3 and StepFunctions in order to process updates to batches of millions of users at once.

  - Utilized the Serverless framework to declaratively create infrastructure and DAO design pattern with custom SQL stored procedures to perform DB calls.
  - Implemented an expansion to the app's features by implementing updates to 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.
  - Led to aggregation of job metrics and logs that allowed for optimization of build bottlenecks and reduced bugs by 12%.
- Designed and implemented automation to building and release delivery of product firmware and metadata 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 utilizing rsync to copy files to file-stores and servers 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