Ayush Hariharan

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Education

University of California, Berkeley – College of Engineering — Berkeley, CA

- *Major – B.S in Electrical Engineering and Computer Science* — *GPA – 3.96 | Graduation – May 2024*

Work Experience

- **Verkada** — San Mateo, CA
  Software Engineering Intern — *May 2023 - Current*
  - **Bazel Workflows**: Designed a self-hosted infrastructure to speed up execution of remote bazel workflows. Specifically, deployed BuildBuddy workflow runners into Verkada's k8s with performance tuning such as shared runner cache backed by local SSD. Following the migration, p50 and p75 for workflow duration improved by 9 and 10 minutes respectively.
  - **Prod-Sharding Deployment**: Created an intelligent deployment system with invoke to simplify the development workflow. Using the deployment type (argoCD, lambda, or docker), fanout script would determine the supported deployment shards.
- **Silicon Valley Bank** — Santa Clara, CA
  Cloud Automation Intern — *Jun 2022 - Aug 2022*
  - **Infrastructure Provisioning**: Used Terraform to provision an application load balancer and multiple EC2 instances within a target group. Regarding networking, configured security group rules, setup an HTTPS listener, and created an IAM policy for AWS SSM to connect with the provisioned instances. Finally, used EC2 user data to create a web server on instances.
  - **EKS Cluster Autoscaler**: Created an IAM service role to allow EKS to perform basic autoscaling (with respect to nodes) and configured the role with cluster OIDC. Used the role to develop a skeleton for an autoscaler controller and added the deployment YAML to an associated Helm chart.
  - **EKS Routing**: Provisioned a Network Load Balancer (with associated target groups and listeners) and route53 DNS record for ingress to the EKS cluster. The load balancer worked along the nginx ingress controller to manage traffic requests.
- **Big Data at Berkeley** — Berkeley, CA
  Project Manager — *Aug 2021 - Present*
  - **AWS Infra**: Configured IAM identity center and setup user profiles within AWS Sagemaker. Wrote custom IAM policies to maintain a 1-1 mapping between sagemaker profiles and IAM users. Created lifecycle configurations to automatically terminate instances within Sagemaker Studio after 120 minutes of inactivity.
  - **Vivensity Sentiment Analysis**: After TFIDF vectorization of imSparked student responses, used VADER and BERT models to assign sentiment labels. Also performed topic modeling with LDA to determine common themes and outliers
- **Jenova Valuation Inc** — New York City, NY
  Machine Learning Intern — *Jun 2021 - Aug 2021*
  - **Stock Prediction Model**: Preprocessed training data and built ML models for regression including Random Forest and Multilayer Perceptron. Trained models while optimizing for MAPE in both the present day and 3 month time frame. Developed an evaluation script to calculate VP Ratio, Price Correlations, Decile Differentials, and Percentile Differential.
- **Blue Cloak LLC** — Sterling, VA
  Software Engineer & Consultant — *Jun 2019 - Aug 2021*
  - **Audio Deepfakes**: Used primarily CNN-based voice-transfer models for in and out of dataset speakers to simulate target speech patterns. Modified CorentinJ's voice cloning model including the WaveRNN vocoder, the Tacotron Synthesizer, and GE2E encoder, to improve deep fake practicality. Implementation was theoretical as models tended to have high variability.

Research

- **CAMLPAD: Cybersecurity Autonomous Machine Learning Platform for Anomaly Detection**
  Published Author & Lead Programmer — *Jun 2019 - Mar 2020*
  - **Publication Link**: https://arxiv.org/abs/1907.10442 **Conference Link:** https://tinyurl.com/ficc2020
- **A Quantum-Genetic Algorithm for Cybersecurity Budget Optimization**
  First Author & Independent Researcher — *Aug 2018 - Jun 2020*

Projects

- **AWS Certification (July 2022)**: Passed the AWS dev associate certification exam. While studying, provisioned the AWS 3-tier architecture (ALB endpoint, EC2 instances, Amazon RDS backend), wrote custom lambda functions with API gateway triggers, and setup ECS Fargate to handle an nginx service. Also, configured networking with security groups and route53.
- **TreatMeWell Application (Aug 2021 - Dec 2021)**: Developed a full-stack mobile application to help patients struggling with medical non-adherence. Designed the backend DB schema within Google Firebase and implemented a frontent UI with flutter. Developed a PCR feature for automatic prescription recognition and wrote backend scripts for push notifications.
- **Stock Analysis Tool (May 2021 - Jul 2021)**: Used Streamlit to develop a web application for stock analysis with both a visualizer and an ML model-building environment. Visualizer includes a candlestick and moving average plotter. ML environment supports both traditional multi-layer perceptrons and CNNs. Link: www.tinyurl.com/stock-predictor.