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 2023*
  Activities – Quant for Fintech at Berkeley. PM for Big Data at Berkeley.

WORK EXPERIENCE

- **Silicon Valley Bank** — Santa Clara, CA
  Cloud Automation Intern — *Jun 2022 - Aug 2021*
  - **Infrastructure Provisioning**: Used Terraform to provision an application load balancer and multiple EC2 instances. 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.

- **Jenova Valuation Inc** — New York City, NY
  Machine Learning Intern — *Jun 2021 - Present*
  - **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.
  - **OSINT Security Analysis**: Developed a realistic employee profile with NLP models on vectorized tweets and utilized this model to bypass company security protocols. Applied clustering models on Creepy geolocation data and SocialMapper metadata to determine frequent travel locations, both local and abroad, for company employees.
  - **Blockchain Data Storage**: Developed a Multichain pipeline to store network data collected by overhead drones. Installed peer clients on multiple Raspberry Pi 4 nodes and setup a consensus algorithm for blockchain peers to approve transactions. Experimented with Hyperledger Fabric as a secondary channel for storing the collected data.

RESEARCH

- **CAMLPAD: Cybersecurity Autonomous Machine Learning Platform for Anomaly Detection**
  Published Author & Lead Programmer — *Jun 2019 - Mar 2020*
  - **Description**: CAMLPAD retrieves cybersecurity data with Elasticsearch and runs ML algorithms like Isolation Forest and K-Means Clustering for processing. Calculated anomalies are visualized using Kibana and assigned an outlier score. The CAMLPAD system achieved an adjusted rand score of 95%, exhibiting the reliable accuracy and precision of the system.
  - **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

- **Fantasy Football Lineup Generator (Aug 2021 - Pres)**: Created a pipeline to predict fantasy production on user-inputted players which includes a web-scraping script for data collection, an ensemble ML regression model, and a lineup optimizer. Incorporated pipeline into a web application with React frontend and Flask backend

- **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.

- **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.

- **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.