Atul Nair

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Education

B.S Mathematics and Computer Science, *University of California, San Diego* *September 2021 - December 2023*
A.S Computer Science, *Foothill DeAnza College* *September 2019 - June 2021*

Skills

Languages : Python C, C++, R
Tools: Tensorflow, Pytorch, SciKit Learn, Pandas, XGBoost, Hadoop, Mapreduce, NLP, NLTK, NoSQL, ROS, Linux
Coursework: Computer Science, Data Science, Statistics, Machine Learning, Data Structures and Algorithms, Design and Analysis of Algorithms, Linear Programming, Linear Algebra, Graph Theory, Discrete Mathematics
Certifications: UCSD - *Introduction to Big Data* (X4QEXP975EAK)

Experience

Machine Learning Engineering Intern, Boson Motors *San Jose CA, September 2024 – present*
- Building anomaly detection systems for the flagship vehicle

Machine Learning Research Intern, SDSC *San Diego CA, December 2021 – March 2022*
- Developed and scaled a U-Net (CNN based) deep learning cardiac left-ventricle image segmentation model using TensorFlow, achieving 95% prediction accuracy on a HPC multi-GPU system.
- Developed and scaled VGG-16 and MobileNet (CNN based) deep learning ImageNet classifiers using PyTorch and PyLightning, achieving 97% and 98% prediction accuracy (respectively) on a HPC multi-GPU system using batch normalization techniques.

Software Engineering Intern (Robotics), Boson Motors *San Jose CA, March 2021 – August 2021*
- Designed and developed a Python-based vehicle data collection pipeline that collects gigabytes of vehicle metrics for analytics use cases.
- Utilized NumPy, Pandas, ROS, and InfluxDB to build out the pipeline.
- Developed an internal vehicle runtime debugger that uses Python, ROS, and RESTFul APIs to notify developers of potential anomalies and statuses when the test vehicle is in operation.
- Prevented 5 major occurrences of hardware failure.

Projects

Controlling Drone Flight with Hand Gestures
- Collaborated with a 6 person team to develop an Electromyography (EMG) signal multi-class classifier with 96% prediction accuracy.
- Trained on a 24 KB hand collected dataset of EMG signals.
- Used Python, Numpy, and Pandas for preprocessing and dataset augmentation.
- Implemented principal component analysis (PCA) and autoregressive (AR) models for feature extraction.
- Developed a 5-fold XGBoost model for inference. Link to paper.

Twitter Political Affiliation Classification
- Collaborated with a 3 person team to develop a NLP Twitter political affiliation classifier with 82% accuracy.
- Trained on a manually scraped dataset of over 786,000 tweets.
- Used Python, NumPy, Pandas, VADER, and NLTK for preprocessing and vectorization.
- Implemented a 5-fold Multinomial Naive Bayes model for inference. Link to notebook.

Breast Cancer Life Expectancy Analysis
- Conducted extensive data analysis on a 44 KB breast cancer tabular dataset containing 16 different features.
- Utilized Python, NumPy, Pandas, and Scikit-learn to preprocess data.
- Implemented a 5 fold Random Forest Classifier for feature extraction.
- Implemented Linear Regression for inference. Link to notebook.

Automatic Differentiation (Autograd) backpropagation engine in C
- Supports basic scalar operations, gradient computations as well as computational graph construction and differentiation. Link to repo.