Atul Nair

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Education

University of California, San Diego
San Diego, CA
Mathematics and Computer Science, B.S — September 2021 – December 2023

Relevant Coursework: Intro to Data Science, Design and Analysis of Algorithms, Statistical Methods, Graph Theory, Linear Programming, Un/Supervised (Machine) Learning

Foothill De Anza Community College
San Jose, CA
Computer Science for Transfer, A.A — September 2019 – June 2021

Relevant Coursework: Programming and Data Structures in C++, Intermediate Java, Differential Equations, Linear Algebra, Discrete Mathematics

Projects

Controlling Drone Flight with Hand Gestures (using Machine Learning)

- Collaborated with a 6 person team to develop an Electromyography (EMG) signal multi-class classifier with **96%** prediction accuracy. The classifier was trained on a **24 KB hand collected dataset** and used **Python, Numpy,** and **Pandas** for preprocessing and dataset augmentation.
- Implemented **principal component analysis** and **autoregressive (AR)** models for feature extraction on EMG data. Developed an **XGBoost** model with **5-fold cross-validation** for inference. Link to paper.

Twitter Political Affiliation Classification

- Collaborated with 3 other peers to develop a Twitter political affiliation classifier with **82%** accuracy. The classifier was trained on a scraped dataset of over **786,000** tweets, and used **Python, NumPy, Pandas, VADER,** and **NLTK** for preprocessing and vectorization. A **Multinomial Naive Bayes** model was implemented with **5-fold cross-validation.** 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 and perform feature selection using a **Random Forest Classifier** with **5-fold cross-validation**. Implemented **Linear Regression** to draw final conclusions. Link to notebook.

Professional Experience

San Diego Supercomputer Center — December 2021 – March 2022
San Diego, CA
Machine Learning Research Intern

- Developed and scaled a **U-Net** 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** 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.

Boson Motors — March 2021 – August 2021
San Jose, CA
Software Engineering Intern

- Designed and developed a **Python**-based vehicle **data collection pipeline** that collects **gigabytes** of vehicle metrics for analytics use cases. The pipeline utilizes **NumPy, Pandas, ROS,** and **InfluxDB**.
- Developed an internal vehicle runtime debugger that uses **Python, ROS,** and ZOHO CRM to notify developers of potential anomalies and statuses when the test vehicle is in operation. The debugger prevented **5 major occurrences** of hardware (motor) failure.

Skills

Python, XGBoost, Tensorflow, Pytorch, Python, SQL, Numpy, Pandas, SciKit Learn, Statsmodels, Seaborn, R, C++, Java, Git, ROS, InfluxDB