ADITYA RAO

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EDUCATION

University of Southern California (3.67/4.0) Los Angeles, CA
Master's in Electrical and Computer Engineering August 2022-May 2024

- **Relevant Coursework:** Machine Learning 1: Supervised methods, Introduction to Deep Learning, Computing Principles for Electrical Engineers (C++), Probability for Electrical and Computer Engineers, Linear Algebra for Engineering, Database Systems

Veermata Jijabai Technological Institute (8.86/10.0) Mumbai, Maharashtra
Bachelor of Technology in Electronics Engineering August 2018-May 2022

- **Relevant Coursework:** Data Structures and Algorithms, C++, Python, Image and Video Processing, Data Science, Neural Networks and Fuzzy Systems, Natural Language Processing, Microcomputer System Design, Digital Signal Processing

EXPERIENCE

ACME Lab, University of Southern California Los Angeles, CA
Graduate Research Assistant June 2023-Present

- Developed a comprehensive dataset for Human Activity Recognition (HAR) by processing MHAD (Motion Capture and Human Action Database) data with MATLAB
- Spearheaded the design and deployment of an 8-coil-based motion tracking system to capture and analyze intricate subject movements
- Leveraged Bidirectional **Long Short-Term Memory (LSTM)** models within the PyTorch framework to enhance motion tracking accuracy, resulting in a notable reduction of loss to **0.0472**

IoT lab Veermata Jijabai Technological Institute Mumbai, Maharashtra
Project Intern August 2021-May 2022

- Created a prototype autonomous self-driving car using Raspberry Pi 4.0 and Arduino UNO R3, achieving **72.63%** lane detection accuracy via Python, OpenCV, and Computer Vision
- Led a team of 4 to construct a **Deep Q-Learning** model for a Self-Driving Car, integrating sensor and orientation inputs for action decisions, and implemented the AI model with PyTorch for neural networks and Kivy for interactive visuals

Indian Institute of Technology Remote
Machine Learning Summer Intern June 2021-July 2021

- Leveraged NLP techniques with **CountVectorizer** and **TF-IDF** methods to analyze news headlines for stock price prediction, attaining **85.44%** accuracy using **Random Forest, SVM, and Decision Tree algorithms**
- Applied Time Series Forecasting approaches, including Moving Average and LSTM models on various equity data attributes (Open, Close, High, Low), attaining an RMSE value of **4.735** for accurate prediction

ACADEMIC PROJECTS

Credit Card Default *Python, Numpy, Pandas, SMOTE, Machine Learning, Matplotlib, clustering, predictive models, data processing*

- Developed payment default prediction models with logistic regression, SVM, and XGBoost, including data preprocessing, feature engineering, and model selection in Python
- Achieved **76.4%** test accuracy and **86%** cross-validation accuracy with XGBoost, hyperparameter optimization via grid search
- Implemented dimensionality reduction techniques such as PCA and LDA and data augmentation through **SMOTE** to enhance model performance and address class imbalance in dataset

End-to-End Satellite Image Classification *MLOps, Pytorch, CI/CD, Flask, Docker, AWS, Transfer Learning*

- Integrated **Tiny VGG** model within PyTorch framework for satellite image classification while creating a user-friendly Flask app
- Demonstrated expertise in executing various project components, including data ingestion, model preparation, callbacks, training, evaluation, and CI/CD deployment
- Utilized MLops tools such as **DVC** for efficient data management and utilized GitHub Actions for streamlined **AWS** deployment

Food Vision *Python, Tensorflow, Keras, Functional API, Transfer Learning, Computer Vision, data visualization, supervised learning*

- Developed a transfer learning model to classify 101 foods, surpassing performance reported in Food101 paper. Performed efficient data preprocessing, batch handling, and training optimization techniques
- Accomplished **77.23%** accuracy by training an **EfficientNetB0** model, supplementing mixed precision, feature extraction, fine-tuning, and real-time monitoring through TensorBoard

AI Playing Doom *Python, Pytorch, Reinforcement Learning, OpenAI, Scikit-learn, Artificial Intelligence, Product, neural network*

- Leveraged **OpenAI Gym** to develop a proficient AI agent for the Doom game, utilizing **deep reinforcement learning**, experience replay, and CNN architecture to achieve high-performance results within the complex environment.

SKILLS

- Programming Languages: Python, C++, HTML, CSS, JavaScript
- Technical Skills: Machine Learning, AWS, Deep Learning, Data Structures and Algorithms, Statistics, Azure, Linux
- Frameworks: Tensorflow, Pytorch, Numpy, Pandas, Seaborn, OpenCV, MongoDB, SQL, Flask, python scripting, troubleshooting
- Tools: Visual Studio Code, Pycharm, Google Colab, Jupyter Notebooks, Tableau, Kafka, Docker, Power BI, Excel, Microsoft Office
- Soft Skills: Leadership, Communication, Teamwork, organizational skills, cross-functional, Focused, networking, revolution
- Advanced Skills: Pyspark, interfacing, data engineering, project management